

Project Manual – Volume 1

Project Number: 21-054.1

Kirby School District 140

New Fernway Park Elementary School

16600 South 88th Avenue, Orland Park, Illinois 60462



For

The Board of Education Kirby School District 140

Administrative Center
16931 S. Grissom Drive
Tinley Park, Illinois 60477

Issued for Bid: October 30, 2023



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SECTION 00030

ADVERTISEMENT FOR BIDS

ADVERTISEMENT FOR BIDS

1.1 BID INFORMATION

- A. Sealed bids will be received by the Board of Education, Kirby School District 140, on December 5, 2023 at 10:00 a.m. prevailing time for the New Fernway Park Elementary School project. Bids will be opened at the District Administrative Office, 16931 South Grissom Drive, Tinley Park, Illinois 60477.
- B. A Non-Mandatory Pre-Bid Conference will be held on November 7, 2023, 3:00 p.m. at Fernway Park Elementary School, 16600 South 88th Avenue, Orland Park, Illinois 60462. All Bidders are encouraged to attend and sign in at the meeting which will also be attended by the Owner, Architect and Engineer.
- C. Anticipated Award of Contract date: December 14, 2023
- D. Anticipated MWRD Permit: February 28, 2024
- E. Anticipated Start of Construction: Phase 1 – March 1, 2024
Phase 2 – June 15, 2025
- F. Anticipated Substantial Completion date: Phase 1 – July 15, 2025
Phase 2 – October 30, 2025
- G. Lump sum bid proposals will be received for this project at the scheduled time of receipt bids and will be publicly opened at that time.
- H. Bid security in the form of a bid bond, certified check or cash in an amount equal to 10 percent of the base bid amount shall be submitted with the bid. Should a bid bond be submitted, the bid bond shall be payable to the Board of Education, Kirby School District 140.
- I. Bids shall be submitted on or before the specified closing time in an opaque sealed envelope addressed to: Mr. Michael Andreshak, Director of Business Services.
- J. The District reserves the right to reject any or all bids or parts thereof, or waive any irregularities or informalities, and to make the award in the best interest of the District.
- K. All bidders must comply with applicable Illinois Law requiring the payment of prevailing wages by all Contractors working on public works. Bidder must comply with the Illinois Statutory requirements regarding labor, including Equal Employment Opportunity Laws.
- L. Bidding documents will be available starting on October 30, 2023 and may be obtained upon receipt of deposit in the amount of \$300 for 1 set of the bidding documents consisting of 2 sets of plans, 2 Project Manuals, 1 Compact Disc containing PDF files of drawings and project manual, and 1 set of bid forms from: Gill Reprographics, Inc. (GRI), 17W715 Butterfield Road, Suite B, Oak Brook Terrace, IL 60181, (630) 652-0800, www.gillrepro.com. If only digital files of bidding documents are requested, a one time non-refundable fee of \$15.00 (payable to Gill Reprographics, Inc.) can be paid. Login information to download digital files will be provided by Gill Reprographics, Inc.
- M. The Architect for the above referenced project is TRIA Architecture, Inc., (630) 455-4500.

Board of Education
Kirby School District 140
16931 South Grissom Drive
Tinley Park, Illinois 60477

END OF SECTION

SECTION 00100

INSTRUCTIONS TO BIDDERS

PART 1 – GENERAL

1.1 PROPOSAL

- A. The Board of Education, Kirby School District 140, will receive sealed bids for the New Fernway Park Elementary School project.
- B. To receive full consideration bids must contain the following documents properly completed and signed:
 1. Bid Form.
 2. Bid Bond.
 3. Statement of Ethics Certification
 4. Certificate of Compliance with Illinois Drug-Free Workplace Act.
 5. Certificate Regarding Sexual Harassment Policy
 6. Certificate of Bidder Eligibility
 7. Certificate of Eligibility to Enter into Public Contracts
 8. Statement of Compliance Certification
 9. Fully completed AIA document A305 providing the Contractor's qualifications and references.

1.2 PREPARATION FOR BIDS

- A. Proposals to be entitled for consideration must be made in accordance with the following instructions.
 1. Submit one copy of bid on forms provided by the Architect with all blank spaces for bid prices filled in, in ink, or typewritten.
 2. Submit one reproduction of bid forms and associated documents.
 3. Submit bid in an opaque, sealed envelope, addressed to: Mr. Michael Andreshak, Director of Business Services.
 - a. Mark the envelope SEALED BID FOR:
 - 1) Project Name.
 - 2) Bidder.
 4. Bids will be received until 10:00 a.m. prevailing time, on December 5, 2024 for all specified work at the District Administrative Office, 16931 South Grissom Drive, Tinley Park, Illinois 60477.
 5. Bids received after this time will not be accepted.
 6. Erasures or written memorandum on the Bid Form are prohibited. Include additional explanations, statements, or qualifications in a separate sheet attached to the Bid Form.
 7. The Base Bid shall appear only where called for in the Bid Form and shall not appear elsewhere in the proposal. Any Alternate prices (other than those set forth in the Bid Form) shall be listed on the Substitution Sheet.
 8. Fill in all blank spaces for the bid items with prices, or if not applicable, the words "No Bid."
- B. The Owner reserves the right to reject any or all bids or parts thereof at its sole discretion.
- C. The Owner reserves the right to waive any or all irregularities or informalities.
- D. The Owner reserves the right to terminate this request for bids at any time in the bidding process.
- E. All costs associated with developing or submitting a bid in response to this request, or to obtain oral or written clarification of its content shall be borne by the respondent. The Owner and Architect, and their agents, assume no responsibility for these costs. This request for bids does not commit the Owner or Architect, or any of their agents, to pay any costs incurred in the preparation or submission of a bid.
- F. Do not detach Bid Proposal Forms from the Project Manual for use in submission of bids; use separate forms furnished by the Architect.
- G. Telegraphic bids will not be accepted, but modifications by telegram of bids already submitted will be considered if received prior to the scheduled closing time for receiving bids.

SECTION 00100

INSTRUCTIONS TO BIDDERS

1.3 DEFINITIONS

- A. All definitions set forth in the General Conditions of the Contract for Construction as printed in AIA Document A201 as modified and included herewith are applicable to these Instructions to Bidders.
- B. Bidding Documents include the Advertisement to Bid, Instructions to Bidders, the Bid Proposal Form and required attachments, AIA Document A101 Standard Form of Agreement Between Owner and Contractor where the Basis of Payment is a Stipulated Sum, 2017 edition, including General Conditions as modified for this project, AIA Document A305, and the proposed Contract Documents including any addendum issued prior to receipt of bids.
- C. Addenda are written or graphic instruments issued prior to the execution of the Contract which modify or interpret the bidding documents, including Drawings and Specifications, by additions, clarifications, or corrections. Addenda will become part of the Contract Documents when the Construction Contract is executed.
 1. Addenda will be issued by Email, FAX transmittal, direct mail or United Parcel delivery. Bidders are to consider all addenda, regardless of method of transmittal, as a binding modification to the contract documents.
 2. It is the bidder's responsibility to ascertain from the Architect that they have received all addenda issued to the bidding documents prior to submitting their bids.

1.4 DOCUMENTS

- A. The Bidding Documents are on file and may be examined at Gill Reprographics, Inc. (GRI), 17W715 Butterfield Road, Suite B, Oak Brook Terrace, IL 60181, (630) 652-0800, www.gillrepro.com.
- B. Prime Contractors may obtain (1) set of the Bidding Documents, consisting of (2) sets of drawings, (2) project manuals, (1) Compact Disc containing PDF files of the drawings and the project manual, and (1) set of bid forms at Gill Reprographics, Inc. (GRI), 17W715 Butterfield Road, Suite B, Oak Brook Terrace, IL 60181, (630) 652-0800, www.gillrepro.com, upon deposit of a check in the amount of \$300.00 made payable to the Owner. Deposit is refundable if a bid is submitted and if drawings are returned in good condition by December 24, 2023 (10 days after bid award), as well as to the winning bidder. If only digital files of bidding documents are requested, a one time non-refundable fee of \$15.00 (payable to Gill Reprographics, Inc.) can be paid. Login information to download digital files will be provided by Gill Reprographics, Inc.
- C. Contractors may obtain additional sets of plans and specifications directly from the Printer. Contractor shall be responsible for the reproduction costs. Amounts paid for additional sets are not refundable.
- D. All documents furnished for bidding purposes (including Compact Disc), obtained by deposit or purchase MUST BE RETURNED to the Printer, transportation prepaid, within ten days after bid award or deposit checks will not be returned.

1.5 EXAMINATION OF DOCUMENTS AND SITE

- A. Bidders are responsible for examining all documents on file at the office of the Printer or Owner and must make a mandatory site visit to examine the site to become familiar with and make allowance for any conditions which may affect the work. Contractors will not be given extra payments for conditions which can be determined by examining the site and documents.
- B. A Non-Mandatory Pre-Bid Conference will be held on November 7, 2023, 3:00 p.m. at Fernway Park Elementary School, 16600 South 88th Avenue, Orland Park, Illinois 60462. It is recommended that all Bidders attend and participate in the conference which will also be attended by the Owner, the Architect, and the Engineer. The Architect will transmit to prospective bidders of record any Addenda the Architect considers necessary in response to questions arising at the conference.

1.6 POST-BID QUALIFICATION

- A. Any bidder may be required to submit supporting data to substantiate that such bidder is properly qualified to carry out the obligations of the Contract and to complete the Work contemplated therein.

SECTION 00100

INSTRUCTIONS TO BIDDERS

1.7 BID WITHDRAWAL

- A. Any bidder may withdraw their bid prior to the scheduled closing time for receiving bids. All bidders shall hold their Bids open for a period of sixty calendar days from the date of Bid Opening. The Owner and Bidders may agree to extend the period of irrevocability beyond the sixty-day period.

1.8 INTERPRETATION OF BIDDING DOCUMENTS

- A. Submit all questions regarding the Bidding Documents to the Architect. Replies will be issued to all bidders of record in the form of an Addendum. Questions received less than five days before the bid opening date cannot be answered.

1.9 NON-SPECIFIED ITEMS

- A. Approved Equal Items:
 1. To obtain approval to use non-specified items, submit written request at least five days prior to the opening date; requests received after this time will NOT be considered.
 2. Requests shall clearly describe the items for which approval is asked including all data necessary to demonstrate acceptability.
 3. If an item is acceptable, the Architect will approve same in an Addendum issued to all bidders of record.
- B. Substitutions:
 1. Substitutions for the items specified may be made by the Contractor only by submitting proposed substitutions on the Substitution Sheet provided.
 2. Requests received after bid opening will not be considered except for the following conditions:
 - a. Product discontinued.
 - b. Insufficient quantity. Except the following will not establish cause for substitution:
 - 1) Failure to award subcontract in sufficient time, or failure to place orders for products so as to ensure delivery without delaying work.
 - c. Delays beyond control, such as strikes, lockouts, storms, fires, or acts of God, which may preclude the procurement and delivery of products for purposes of the Project.
- C. No consideration will be given to substitutions after the Contractor submits the Schedule of Values.

1.10 METHOD OF AWARD

- A. If the Owner should award a Contract, the Owner will award it to the lowest responsible bonafide Bidder with full consideration given to Contractor's Completion Schedule.
- B. In determining the lowest responsible bona fide Bidder and in awarding a contract, the Owner may take into consideration skill, facilities, capacity, experience, ability, responsibility, previous work, financial standing of bidder, amount of work being carried on by bidder, quality and efficiency of construction equipment proposed to be furnished, period of time within which proposed equipment is furnished and delivered, and necessity of prompt and efficient completion of work herein described.

1.11 PROPOSAL REQUIREMENTS

- A. Bidder's proposals shall be expressly based on the following items:
 1. Instructions to Bidders.
 2. Bid Proposal Form.
 3. General Conditions.
 4. Plans and Specifications.
 5. Addenda

SECTION 00100

INSTRUCTIONS TO BIDDERS

- B. Any Contract resulting from the Bidding Documents will incorporate the terms and provisions of said documents. It is intended that these Bidding Documents shall prevail over conflicting terms and conditions of Contractor's proposal. Bidder's printed terms and conditions are NOT considered as exceptions to the Contract.

1.12 BID SECURITY

- A. Accompany bids with a Bid Bond, Certified Check or Bank Draft for an amount of Ten Percent of the Base Bid as a guarantee that, if award is made, the bidder will sign the agreement and furnish the required bonds within five days or forfeit his bid security as liquidated damages, but not as a penalty. Execute Bid Bond on A.I.A. Form A-310, current edition or on form furnished by the Architect.
 - 1. Make Bid Security payable to: Board of Education, Kirby School District 140.
- B. Where a bid bond is given as the bid security, the bid bond must comply with the rating level required for the performance and payment bond as stated in the AIA document A101-Exhibit A included in specification section 00700.
- C. The bid security of all except the three lowest bidders will be returned within five days after the award of the Contract.
- D. The bid security of the successful bidder and the two other bidders will be returned promptly after the Owner and the accepted bidder have executed the agreement, and the appropriate bonds and certificates of insurance have been provided by the successful bidder. Bid security of the other Contractor's will be returned promptly after agreement is finalized.

1.13 PERFORMANCE ASSURANCE

- A. Accepted Bidder: Provide a Performance and Labor and Material/Payment bond.
 - 1. Provide a 100 percent Performance Bond on AIA A312.
 - 2. Provide a 100 percent Payment Bond on AIA 312.
 - 3. Deliver bonds within 3 days after execution of the Contract.

1.14 OTHER CERTIFICATIONS AND SUBMITTALS

- A. All bidders must complete and sign the following certifications and submit them with their bid proposals. FAILURE TO DO SO MAY RESULT IN DISQUALIFICATION OF BIDDER.
 - 1. Statement of Ethics Certification
 - 2. Certificate of Compliance with Illinois Drug-Free Workplace Act.
 - 3. Certificate Regarding Sexual Harassment Policy
 - 4. Certificate of Bidder Eligibility
 - 5. Certificate of Eligibility to Enter into Public Contracts
 - 6. Statement of Compliance Certification
 - 7. Fully completed AIA document A305 providing the Contractor's qualifications and references.
 - 8. Fully completed AIA Document A305.

1.15 POWER OF ATTORNEY

- A. Attorneys-in-Fact who sign bonds, Agreements or bids must file with each such document a certified and effectively-dated copy of their Power of Attorney.

1.16 EMPLOYMENT AND LABOR PROVISIONS

- A. In the employment and use of labor, the Contractor and his subcontractors shall conform to the Illinois Statutory requirements regarding labor and wages. See Document 00820 - Prevailing Wage Requirements.
- B. Vendors/Contractors must conform to all federal, state, local and OSHA Regulations now in effect.
- C. The Contractor shall not discriminate against any employee or applicant for employment because of race, color, religion, sex or national origin.

END OF SECTION

SECTION 00220

GEOTECHNICAL DATA

PART 1 – GENERAL

1.1 REQUIREMENTS INCLUDE

- A. Contractor:
 - 1. Verify data and existing conditions.
 - 2. At Contractor's option, perform additional subsurface investigation at own expense.

1.2 RELATED REQUIREMENTS

- A. Specified elsewhere:
 - 1. 01100 - Project Summary
 - 2. 01270 - Unit Prices.
 - 3. 01400 – Quality Requirements
- B. By others: Seeco Consultants, Inc., 7350 Duvan Drive, Tinley Park, IL 60477, Phone: (708) 429-1666, Fax: (708) 429-1689, Colin Gray, S.E., P.E. and Garrett Gray, P.E., Project Engineer.
 - 1. Soil boring location diagram and log are included in this Section consisting of 87 pages.
 - 2. Soil boring data is included for information only. The Owner and the Architect/Engineer do not guarantee the accuracy or validity of the data, nor do they assume any responsibility for the Contractor's interpretation of the data.

1.3 SOIL BORING DATA

- A. A complete Geotechnical Data Report for the project is included under this cover. The report includes a general summary of findings for the site conditions, as well as a mapping and boring report.

1.4 UNCONTAMINATED SOIL CERTIFICATION

- A. An Uncontaminated Soil Certification Letter (IEPA Form LPC-663) for the project is included under this cover. Upon selection of a Contractor, the "Site Operator" Information will need to be completed.

END OF SECTION

JANUARY 23, 2023
SEECO JOB NO. 13193G

FINAL

**SUBSURFACE EXPLORATION, LABORATORY TESTING
AND GEOTECH ENGINEERING AND ANALYSIS
FOR THE PROPOSED NEW FERNWAY PARK ELEMENTARY SCHOOL,
KIRBY SCHOOL DISTRICT 140
16600 SOUTH 88TH AVENUE
ORLAND PARK, ILLINOIS 60462**

PREPARED FOR:

**KIRBY SCHOOL DISTRICT 140
16931 SOUTH GRISSOM DRIVE
TINLEY PARK, ILLINOIS 60477
ATTN: MR. MICHAEL ANDRESHAK,
DIRECTOR OF BUSINESS SERVICES**

PREPARED BY:

**SEECO CONSULTANTS, INC.
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EXECUTIVE SUMMARY

This geotechnical engineering report is for the new Kirby School District 140 Fernway Park Elementary School to be located on 88th Avenue in Orland Park, Illinois 60462. This new building will be built just west of the existing in use Fernway Park Elementary School of Kirby School District 140 will be demolished and the rubble hauled off the site when the new 90,448 square foot predominantly one story slab on grade building is completed and then occupied.

In the location of the original location of the Fernway Park Elementary School will after demolition of the old building and removal of the rubble legally from this site, a new car parking lot with 137 parking stalls and 5 handicap stalls will be constructed where the existing Fernway Park Elementary School exists. Also new access drives off of 88th Avenue on the perimeter of the vehicular car parking lot on the east side of the new Fernway Park Elementary School in a U shape will also be constructed.

The first floor elevation of the new Elementary School Building will be 714.0 MSL for the majority of building except for the Early Development Wing on the north end of the new building the first floor elevation will be 712.5 MSL for an approximately 70 feet (N/S) by 160 feet (E/W) area of 11,200 square feet.

The new Elementary School will also have a new gymnasium to be located in Module C (See Tria Architecture Plan A1.20) will be approximately 8182 SF in floor area and approximately 63.67 feet E/W by 128.5 feet (North/South) and approximately 28 feet high.

Also in Module A, a 155.33 ft. (E/W) by 87.33 ft. (N/S) mezzanine will be constructed. This approximately 13,565 square foot area will be on the west end of the new elementary school building.

All of the new school rooms will have continuous exterior and possibly interior wall footings with isolated steel column with concrete floor slabs on grade, exterior masonry bearing walls with backup CMU walls and a simple steel beam and column framing with roof joists and metal decking to support the new roofs. The new 64 foot (E/W) by 129 foot (N/S) gymnasium will have long span joists over the 64 foot span width.

Between December 27, 2022 and December 28, 2022 due to restricted time of drilling at the existing Fernway Park Elementary School SEECO Consultants Inc., drilled and sampled all seventeen (17) borings to the depths which Tria Architecture specified in the Proposal Documents for Geotech Engineering Services dated December 1, 2022. All drilling was done by SEECO Consultants drilling personnel with a truck mounted Diedrich D-50 auger core rotary drill rig on the above listed 2 days at the site. One (1) environmental soil sample was obtained at Boring B-9, 2 foot depth for CCDD testing in order to complete an IEPA LPC-663 if clean. Season high groundwater elevations will be provided for the 2 proposed underground stormwater vault storage (Stormtraps) one in the northwest corner and one in the new east parking area east side per the Preliminary Grading Plan dated 10/26/2022 by Manhard Consulting, Civil Engineers.

The soil borings from this building site generally exhibit stiff to very stiff to hard brown to brown and gray silty clay glacial till which has very good bearing capacity. The **Boring Location Plan** and all seventeen (17) **Boring Logs** for this project are found in the **Appendix** of this report.

According to Tria Architecture, Project Architect, Ms. Margaret Gory, AIA, the Early Development Wing First Floor Elevation will be 712.5 MSL whereas the majority of the floor area on the first floor will be 714.0 MSL.

Based on the soil boring logs and geotech laboratory testing of the onsite building soils the site may utilize continuous exterior and interior wall footings and isolated interior spread footings for interior column support and should be designed for the maximum net allowable bearing capacity of 4000 psf at the stated minimum bottom of footing elevations or deeper bearing on stiff to very stiff brown to brown and gray silty clay glacial till as follows:

Bearing Capacity Table

Area	First Floor Elevation	Maximum Net Allowable Bearing Capacity	Minimum Elevation of Bottom of Footings
Main Portion	714.0 MSL	4000 psf	710.00 MSL
*Early Development Wing	712.5 MSL	4000 psf	708.5 MSL

*Except near B-2 approximately 7 feet of unsuitable soil excavation and disposal to be replaced by suitable brown silty clay excavated soils from other parts of the new Elementary School Building pad site or site placed in 8 inch loose lifts compacted to 95% Modified Proctor Density per ASTM D 1557-12 in the presence of a field engineer from SEECO Consultants in the field at the time of construction.

Details of the proposed elementary school building foundations are found in the body of this report to follow.

Authorization

This project geotech investigation was authorized by Mr. Michael Andreshak, Director of Business Services of Kirby School District 140 16931 South Grissom Drive, Tinley Park, IL 60477 by signing SEECO Consultants Inc. Proposal & Contract for Geotech Engineering Services plus CCDD Testing for the new Fernway Park Elementary School to be located on 88th Avenue in Orland Park, Illinois on December 19, 2022 and then emailing the signed contract back to Don Cassier from SEECO Consultants that day.

PROJECT OVERVIEW

Project Description

Kirby School District 140 is going to build a new Fernway Park Elementary School of approximately 90,488 square feet in floor area just west of the existing operating Fernway Park Elementary School at 16600 South 88th Avenue, Orland Park, Illinois. Most of the building is one story slab on grade except part of the building mezzanine area has 1.5 to 2 story areas in two (2) selected locations.

The new elementary school will have an approximately 11,200 square foot for Early Development Wing on the new building north with the slab on grade floor slab first floor elevation being 712.5 MSL.

The rest of the slab on grade building to south of the Early Development Wing will have a first floor elevation of 714 MSL – 1988 NAVD.

On January 9, 2023 at SEECO Consultants request for the floor plans and typical cross sections and the preliminary grading plan from the Project Architect, Ms. Margaret Gory, AIA of Tria Architecture the following documents were obtained.

Manhard Consulting – Preliminary Site Grading Plan with the FF 714.0 MSL southern portion of new elementary school and FF 712.50 MSL Early Development Wing dated 10/26/2022. This plan also shows the location of the east side vehicle car parking for 137 stalls and 5 handicap parking stalls and a U-Shaped exterior bus lane to the east side of the new elementary school

with 2 stormwater underground detention stormtraps and one under the proposed new 137 car parking lot east of the new building and one Stormtrap in the northwest corner of the site.

Tria Architecture building plans for the 4 module building A, B, C and C the following sheets:

Sheet A1.20 – Second Floor Mezzanine Plan dated 1/05/23

Sheets A-1, A2 and A3 - Exterior Elevations each dated 10/25/2022

Sheets A5.00 and A5.01 – Building Cross Sections each dated 1/05/2023

Sheet A1.10 – Overall First Floor Plan dated 1/05/2023

The building floor slabs will be at grade.

The structural framing system will be simple steel beam and steel columns, WF or tube columns with floor and roof joists and metal decking to support the roof. The interior columns will be supported by interior isolated spread footings. The perimeter exterior wall footings will be supported by continuous reinforced concrete wall footings as well as the interior corridor continuous wall footings.

The new gymnasium will be approximately 63.67 feet (E/W) by 128.33 feet (N/S) for 8171 square feet in area approximately 28 feet high.

The classroom at ceiling clear height is to be 15 feet.

The building structure will consist of a floor slab at grade with continuous exterior and interior corridor wall footings with exterior masonry wall with CMU backup block and interior CMU corridor partition walls with a simply support beam and column steel frame with interior steel Wide Flange of Tube Columns supported by interior isolated reinforced concrete spread footings. The roof will be supported by steel joists between the beams. The steel joists for the roof will support the corrugated metal decking to be able to support the roofing. SEECO Consultants has not been able to contact the Project Structural Engineer, Larson Engineering, to get an idea of the working Dead Loads and Live Loads but from our experience the working service maximum column DL+LL will be 40 kips to 120 kips/column.

Site Geology

The native soils at the project site are the product of the result of Wisconsinan Stage of the Continental Glacier. The Wisconsinan Ice was the last to cover the North American Continent, receding from this area some 13,500 years ago. Present land forms in this area are the results of the Wisconsinan glaciation action during the Pleistocene Epoch. The soils were formed from the natural deposition erosion and weathering processes that have prevailed to the present time. The Pre-Wisconsin glacial deposits are found only in deep bedrock valleys and ravines where they were sheltered from the erosive action of the Wisconsinan Ice Age.

According to the Illinois State Geological Survey (ISGS) Surficial Geology of The Chicago Region (Willman, H.B. and Lineback, Jerry A., 1970), the native soils at this project site have been assigned to the Valparaiso Morainic System which belongs to the Woodfordian, Twocreekan, Valderan Substage of Wisconsinan stage. The native soils usually consist of glacial till of the Westmont Sub Moraine of the Valparaiso Morainic System. This silty clay glacial till is brown to brown and gray in color in the oxidized zone and gray in the unoxidized zone generally at least 10 feet deep. This moderately over consolidated silty clay glacial till has preconsolidation pressures of 5 to 7 TSF and greater with OCR of 4 to 8.

FIELD AND LABORATORY RESULTS

Subsurface Site Exploration

Between December 27, 2022 and December 28, 2022, SEECO Consultants Inc. with a two man drill crew and a truck mounted Diedrich D-50 auger core drill rig drilled and sampled this site 17 soil borings. All borings were laid out in the field by an engineer from SEECO Consultants before clearing the site utilities before commencement of drilling at this site. All 17 soil borings were performed at the approximate boring locations on the **Boring Location Plan** given in the **Appendix** of this report.

The ground surface elevation at each boring location was linearly interpolated by SEECO Consultants from plotting the boring locations on the Boundary & Topographic Survey Sheets Sheet 3 of 3 by Manhard Consulting dated 3/25/22 with an Illinois Professional Land Surveyor signed and stamp signed and stamped by Mr. Timothy Murphy IPLS No. 2870 on April 22, 2022.

On the basis of the Geotech Engineering specifications by Tria Architecture for Kirby School District 140 dated December 1, 2022 the actual depths of drilling for each 17 borings are given in the following table.

Proposed Structure	Boring Number	Depth of Soil Boring (Ft.)	Total Footage (Ft.)
School Building	B-2, B-3, B-5, B-11, B-12, B-14	15	90
School Building	B-4, B-6, B-7, B-9, B-10	20	100
NW Stormtrap, Parking & Drives	B-1, B-8 B-13, B-15	7	28
East Stormtrap & Drive	B-16, B-17	14	28

TOTAL FOOTAGE: 246 LF

All of the soil borings were laid out in the field by a representative of SEECO Consultants at the approximate locations requested in Tria Architecture in its December 1, 2022 Request for Soil Borings and CCDD Testing Proposal for Kirby School District 140 New Fernway Park Elementary School Project.

All borings were drilled and sampled at this site by SEECO Consultants utilizing a truck mounted Diedrich D-50 drill rig and a two man crew which advances the boreholes by utilizing hollow stem augers.

Representative soil samples were obtained utilizing a split spoon sampler in which a split spoon sampler having a two inch outside and inside diameter of 1-3/8 inch and length of 2 feet is driven into the soil in accordance with ASTM D 1586-18. This sampler is advanced by driving with a 140 pound weight falling freely from a height of 30 inches with the Standard Penetration Resistance (N value) being recorded as a number of blows required to advance the sampling spoon a distance of 12 inches after initial driving of six inches to seat the sampler.

All split spoon samples were visually classified in the field and representative soil portions of the split spoon samples were placed in glass containers with screw-type lids and taken to our geotech laboratory for further examination and testing.

The Standard Penetration Resistance values, natural moisture contents, and unconfined compressive strengths by penetrometer for cohesive soil samples are given on the boring logs. See **Appendix** of this report for **Boring Location Plan** and **Soil Boring Logs**. The boring logs also indicate the groundwater level information and pertinent information regarding the methods of maintaining and advancing the bore holes.

Environmental Screening and Testing of Site Soil Samples

A geoenvironmental engineer from SEECO Consultants, Inc. environmentally screened the obtained soils samples in SEECO's Geoenvironmental Lab using a photoionization device (PID) utilizing a Mini RAE 3000 PID 10.6 (eV) lamp in conjunction with visual and olfactory observations to determine the presence of petroleum contamination in the subsurface soils. All the PID readings were zero ppm and no odors or staining was observed in any of the soil samples obtained for this exploration. PID readings are shown on the project **Boring Logs** in the **Appendix** of this report.

Also, one (1) discrete soil sample obtained from one boring, Boring B-9, 2 foot depth at the new building location and is already tested by an approved IEPA Environmental Laboratory, First Environmental Laboratories, Naperville per CCDD soil disposal parameters of pH, VOCs, SVOCs and 8 RCRA Metals for the new elementary school building site for this report. See the **Boring Logs** in the **Appendix**. The environmental chemical analysis results indicate no concentrations are above CCDD Maximum Allowable Concentrations, then the soils tested are assumed to be to the best of our knowledge, clean uncontaminated fill material. This information is documented on the completed **IEPA LPC-663 form** in the **Appendix** of this report.

Geotech Laboratory Testing Program

The geotech laboratory testing program consisted of performing the natural moisture content on all soil samples, unconfined compressive strength tests on the basis of calibrated penetrometer readings for all the cohesive soil samples and visual classification on all soil samples obtained.

In situ moisture content or natural water content is determined in the geotech laboratory as follows (ASTM D 2216-19). A portion of each sample is weighed; oven dried at $110^{\circ} \pm 5^{\circ}\text{C}$, and reweighed to obtain the weight of water in the sample. The moisture content is the ratio of the weight of water in the soil sample to the weight of the dry soil expressed as a percentage of the total dry weight.

After completion of the testing program, each soil sample was visually classified based on texture and plasticity in accordance with the Unified Soil Classification System (ASTM D 2487-17 and D 2488-17). The estimated group symbol according to this system is included following the description of the soil on the boring logs.

A brief explanation of the **Unified Soil Classification System** is included in the **Appendix** of this report. All laboratory test data is noted on the **Boring Logs**, which are also included in the **Appendix** of this report.

Site Soil Conditions

Generally approximately 1 foot thick black clayey topsoil was found on the new elementary school site based on the 17 borings drilled and sampled at the site by SEECO Consultants Inc.

The generalized soil profile at this site according to descending depths is as follows:

- 1) Surficial black clayey topsoil or black clayey topsoil fill each boring location approximately 1 foot thick.
- 2) Brown to brown and gray stiff to very stiff to hard silty clay glacial till with unconfined compressive strength values of 2.5 TSF to 4.5 TSF with the average values being in the 4.0 TSF range. This moderately overconsolidated Wisconsin Age glacial till has a preconsolidation pressure ranging from 5 TSF to 7 TSF and generally with natural moisture contents of 18 to 22% by dry weight. Generally this stratum at this site is 15 to 20 feet thick.
- 3) Underlying the aforementioned oxidized silty clay glacial till is found in the unoxidized gray silty clay glacial till. This gray silty clay generally stiff to very stiff in consistency. This layer was only found in this exploration in Boring B-2 from 9 foot depth to the bottom of the borehole at 15 feet. This moderately overconsolidated Wisconsin Age glacial till generally has a preconsolidation pressure of between 5 TSF to 7 TSF.
- 4) Only in Boring B-2 near the edge of the existing northwest corner detention pond on this 10 acre school site approximately 7 feet of relatively uncompacted brown and gray silty clay fill was encountered in the subsurface investigation by SEECO Consultants.

Site Groundwater Conditions

No groundwater was in any 16 of the 17 borings drilled and sampled for this exploration at this new elementary school site.

Only Boring B-17 exhibited groundwater at 10 feet depth at approximately 705.5 MSL in a saturated brown and gray clayey sand which is loose in relative density. This boring B-17 was drilled and sampled in a playground area just north of the existing Fernway Park Elementary School.

No groundwater was encountered while drilling and while sampling the boreholes. Boring B-17 experienced wet cave-in of its sidewalls in the saturated brown and gray clayey sand to saturated gray silty sand strata below from 12 to 14 feet causing the groundwater level to artificially rise to 8 feet below the original ground surface at Boring B-17. This reading is erroneous and should be ignored.

Monthly and seasonal and yearly groundwater levels will change with antecedent rainfalls and fluctuations with seasonal rainfalls and snowfalls and must be monitored over time to get the long term groundwater levels using monitoring wells.

ENGINEERING RECOMMENDATIONS

Site Preparation

The existing new elementary school site will be just west of the existing Fernway Elementary School to be demolished and legally disposed of offsite after construction of the new elementary school building and it is occupied and up and running.

The existing site topographic at the new elementary school building site exhibits the existing ground surface to grade from 715 MSL 1988 NAVD to 714 MSL toward the north sloping down gently to the northwest corner detention pond edge elevation approximately 703 MSL. This existing detention pond site (majority area) will be the location of a new underground stormwater storage stormtrap structure being designed by the Project Civil Engineer, Manhard Consulting, Chicago, Illinois.

Based on the above mentioned grade an approximated 2 foot average cut will be over the site except in the northwest corner of the Early Development Wing in the location of Boring B-2, where approximately 7 feet of undercut to the very stiff brown and gray silty clay glacial till will be needed. Approximately 1.0 foot of black clayey topsoil is part of the average 2 feet of building pad cut which should be done with at least a 10 foot offset on all sides of the new one story to 2.0 story slab on grade elementary school building.

Upon excavating to the proposed elevations (bottom of drainage fill for proposed building additions), it is recommended to proofroll these areas by using a rubber tire truck or tractor-trailer combination loaded with 20 tons of payload. Upon proofrolling, if any of these areas are

found to be pumping or excessive rutting is observed, then all the soft or loose, unsuitable material should be removed and replaced with compacted select granular fill to the proposed bottom of drainage fill elevation for the proposed building addition footprint. The IDOT CA-6 Type B select granular fill material should be placed in maximum 8-inch loose lifts with each lift compacted to a minimum of 95% of ASTM D 1557-12 (Modified Proctor Test). The earthwork and the subgrade preparation compactive effort shall be performed as specified in the table below.

SUMMARY OF DENSITY REQUIREMENTS

Area	Density Requirements
Building	95% Maximum Density*
Parking Lots, Driveways, P.C.C. Aprons	90% Maximum Density*
Open Areas (Grass Areas)	85% Maximum Density*

*In accordance with ASTM D 1557-12.

Any and all structural clay fill from onsite borrow pit areas must be preapproved by the Project Geotech Engineer and tested for Modified Proctor density (ASTM D 1577-12) and placed in 8 inch loose lifts and compacted to 95% Modified Proctor density as confirmed by a Field Geotech Engineer from SEECO Consultants at the time of construction in the field.

After the new elementary school building is completed and occupied and being fully used the demolition and legal disposal of the old school building rubble and old foundations and floor slabs should be completely removed from site and the former elementary school building foundation area should be backfilled with select granular fill IDOT CA-6, Type B crushed stone compacted in 8 inch loose lifts to 90% Modified Proctor density per ASTM D 1557-12.

Foundation Design Recommendations

On the basis of the soil borings drilled, sampled and tested for this new building exploration this building site may utilize continuous exterior and interior wall footings and isolated spread footings for interior columns support and should be designed for a maximum net allowable bearing capacity of 4000 psf at the to be stated minimum elevation of bottom of footing or

deeper bearing on stiff to very stiff brown to brown and gray silty clay at the following elevations in the **Bearing Capacity Table** to follow:

Bearing Capacity Table

Building Portion	First Floor Elevation MSL	Max. Net Allowable Bearing Capacity PSF	Minimum Elevation Bottom of Footings MSL
Main	714.0	4000	710
*Early Development Wing	712.50	4000	708.5

*Except in location near Boring B-2 approximately 7 feet of unsuitable bearing soil excavation and disposal to be replaced with compacted suitable brown to brown and gray silty clay excavated from other parts of the building pad onsite or onsite suitable clay borrow pit in a green area with no site utilities to be installed there. This borrow silty clay fill should be placed and compacted in 8 inch loose lifts to 95% Modified Proctor density per ASTM D 1557-12 in the presence of a field geotech from SEECO Consultants as verified in the field at the time of construction.

All footings should be founded at least 4.0 feet from finished first floor for frost protection (that is 3.5 feet minimum from finished overlot grade).

The net allowable bearing capacity is the net allowable soil bearing strength in excess of the present existing effective overburden pressure.

The exterior perimeter foundation wall footings only need to be damp proofed but no perimeter foundation footing drains are needed since no free groundwater was encountered in any of the borings drilled and sampled during this subsurface exploration by SEECO for the proposed building pad area.

Floor Slabs Design

To support the slab-on-grade concrete floor slab for the proposed one-story slab on grade school building, it is recommended that after preparing the site (stripping topsoil and proofrolling subgrade) as mentioned in **Site Preparation** paragraph, a minimum 4 inches of granular drainage fill (CA-6 gradation per 2022 IDOT Standard Specifications) should be placed and compacted to a minimum 90% of maximum density in accordance with ASTM D 1557-12(2021). A sheet of visqueen, a capillary water barrier (6 mil thick), positioned on the top of the granular fill should be placed before the concrete floor slab is poured. The proposed concrete floor slab for the proposed school building addition should be designed for an average vertical subgrade modulus of 150 pci based on either the PCA methodology or the ACI-360R-06 publication

“Design of Slabs-on-Ground” current edition.

Stormwater Management Stormtrap Comments

On January 9, 2023 at SEECO Consultants request the Project Architect, Ms. Margaret Gory, AIA email the following documents.

Manhard Consulting – Preliminary Grading Plan dated 10/26/2022 exhibiting the east side new 137 car vehicle parking lot with a U-lane exterior bus lane up to the east side of the new elementary school with 2 stormwater detention stormtraps one in the northwest corner of the site underground being approximately 170 feet (North/South) by 205 feet (East/West) less 2700 ft² to give a storage area of approximately 32,150 square feet area. The east side of underground stormtrap under the 137 car vehicle parking is approximately 125 feet (East/West) by 155 feet (North/South) yielding approximately 19,375 square feet of stormwater storage area.

As I told Mr. John Morrison, P.E., of Manhard Consulting, the Project Civil engineer no ground infiltration will occur in the very stiff brown to brown and gray silty clay subsoils therefore the infiltration rate per the MWRDGC WMO ordinance will be less than 0.5 inches.hr therefore a solid concrete bottom floor slab will be required for each of these underground stormwater detention basin which will release the stormwater stored at the WMRDGC WMO allowable release rate to nearby existing storm sewers.

The elevation of the seasonal high groundwater levels based on the oxidation color changes of the subsoil was given in a Memo from Collin W. Gray, S.E., P.E., SEECO Consultants Inc. on January 17, 2023 by email to Ms. Margaret Gory, AIA, RA, Tria Architecture and John Morrison, P.E., Manhard Consulting but will be reiterated here.

For the east side parking lot stormtrap Boring B-16 shows no change in color from brown to gray ta its full depth of 14 feet (so the elevation of the seasonal high groundwater based on oxidation color change for Boring B-16 is greater depth than 701.5 MSL.

For the west side stormtrap in the northwest corner of the site from Boring B-2 the seasonal high groundwater level based on color change is 9.5 feet from the existing ground surface giving a seasonal high groundwater level of 693.4 MSL based on the MWRDGC WMO. It is to be noted that neither one of these borings exhibited any free groundwater when each boring was

drilled and sampled at the site on 12/27/22 and 12/28/22, respectively.

Pavement Design Suggestions

For the new 137 space with 5 handicap parking stalls for vehicular car traffic on the new east side parking lot the standard duty asphalt pavement section should be as follows in the absence of traffic count estimates and distributions of cars, pickup trucks and panel trucks and design life of the new pavement to be able to use Chapter 54 of current IDOT Design Manual.

The suggested pavement cross section for standard duty pavement is:

- 2 inches of IDOT HMA N50 Surface Course
- 2 inches of IDOT HMA N50 Binder Course
- 10 inches Compacted IDOT CA-6, Type B Crushed Stone

All Heavy Duty Asphalt Pavement Bus Lanes should have the following suggested pavement section:

- 2 inches of IDOT HMA N50 Surface Course
- 3 inches of IDOT HMA N50 Binder Course
- 12 inches of Compacted IDOT CA-6, Type B Crushed Stone

All Heavy Duty Concrete Pavement should have the following cross section suggested:

- 8 inches of PCC Cement Concrete
- $F_c' = 4000$ psi with 6"x6" #10x#10 WWM
- 4 inches of Compacted IDOT CA-6, Type B Crushed Stone

All the pavement components HMA Surface and Binder Course and Aggregate Base Courses should be compacted according to the 2022 IDOT "Standard Specifications for Road and Bridge Construction."

All construction work and materials should be per the 2022 IDOT Edition of the "Standard Specifications for Road and Bridge Construction."

Seismic Site Classification

The Seismic Site Classification according to 2018 International Building Code (IBC) of the Village of Orland Park for the proposed new school building in the Village is provided in this

section. The soil is classified per Section 1613.2.2 "Site Class Definitions" per the 2018 edition of the International Building Code for the average properties on the top 100 feet of subsurface materials which refers to Chapter 20 of the ASCE 7-16 *Minimum Design Loads and Associated Criteria for Buildings and Other Structures*. In the area of the new school building the soil profile is 90 to 100 feet deep per SEECO Consultants 52 year experience in this locale. Based on the average depth of the bedrock in this area the Seismic Site Classification is Site Class D (Stiff Soil Profile) per Table 20.3.1 Site Classification of Chapter 20 of the ASCE 7-16 Minimum Design Load Book.

The net allowable static bearing capacity may be increased for transient loadings per IBC 2018 Building Code by 33% over the design static soil bearing capacity. Therefore, the dynamic design bearing capacity for earthquake loading or seismic loading may be taken as 5,320 psf for the proposed school building.

Excavation Procedures

Excavations that extend greater than five feet in depth should be designed in accordance with U.S. Department of Labor, Occupational Safety and Health Administration 1989 (OSHA) "Occupational Safety and Health Standards - Excavations; Final Rule" 29 CFR, Part 1926, Subpart P. Excavations with properly sloped or braced excavation earth retention systems to prevent excavation instability and provide safety.

The upper soils below the upper clay fill generally consist of stiff to very stiff brown and gray silty clay to 10 foot depth below existing ground surface which are Type A soils. Any excavations for underground stormwater storage volume control between 1 to 5 feet depth should be generally made with maximum allowable side slopes of 3/4H:1V in these cohesive clay soils.

The general contractor and excavation subcontractor are responsible for the means and methods of safe construction excavation and construction sequencing or scheduling per the current OSHA regulations referenced above. Stockpiles of materials or construction equipment should not be placed near the edge of excavation slopes per OSHA.

Potential Construction Problems

Unsuitable Undercut Excavations

Once the building pad is stripped clean of topsoil and cut to bottom of bottom of drainage fill grade and then proofrolled with a tractor trailer semi-truck loaded with 20 tons of payload in areas which don't pass the proofroll as witnessed by a field engineer from SEECO Construction Services such as area of Boring B-2 in the northwest corner of the Early Development Wing will have to excavated out to adequate bearing subsoils and refill the undercut volume with compacted onsite suitable brown silty clay borrow fill either from the new building pad, footing excavations and/or green areas borrow pits where no utilities are located or will be located where no pavements will exist with the borrow pit refilled with onsite surplus topsoil not used for topsoil redistribution in landscape areas.

Groundwater

When considering the depth to the groundwater table in relation to the proposed average excavation depth for the foundation excavations for the New Fernway Park Elementary School, it is generally thought that groundwater will not be potentially be an issue during excavation in the proposed building area. It is recommended that standard perimeter ditch, sump, and pump procedures be used during construction of the building foundations to remove any perched water or stormwater

It is recommended that any water if encountered, should be completely removed from the bottom of all proposed footings before placement of concrete for the footings. During the rainy seasons and under normal conditions, surface runoff that may accumulate overnight or momentarily in foundation excavations can be removed by means of standard perimeter ditch, sump, and pump procedures. Care should be exercised to remove all water as well as any loosened or disturbed materials from the base of all foundations immediately prior to the placing of concrete.

Review of Plans and Specifications

It is recommended that the SEECO Consultants, Inc. should review the final foundation plans and specifications for the proposed building once they are completed.

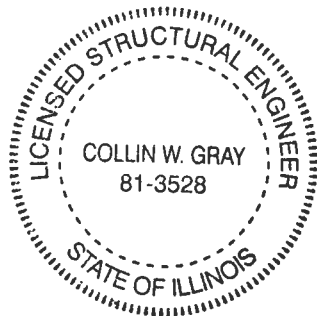
Construction Consultation Engineering

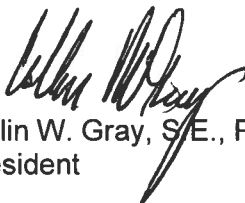
A Geotechnical Engineer from SEECO Construction Services, Inc. should be present during the earthwork operations to ensure compliance with the specifications. The proofrolling should be performed in the presence of a Field Geotechnical Engineer from SEECO Construction Services, Inc. The net allowable soil bearing capacity should be confirmed in the field by a Field Geotechnical Engineer from SEECO Construction Services, Inc. at the time of construction in the field. Field density tests to determine the degree of compaction of backfill of the building should be performed by a Field Geotechnical Engineer from SEECO Construction Services, Inc.

Closing Remarks

We trust this report and the information contained herein is sufficient for your present requirements. We have welcomed the opportunity to be of service to you on this project. If there are any questions regarding this report, please contact us at your convenience.

Respectfully submitted,
SEECO Consultants, Inc.




Collin W. Gray, S.E., P.E.
President



CWG:arm

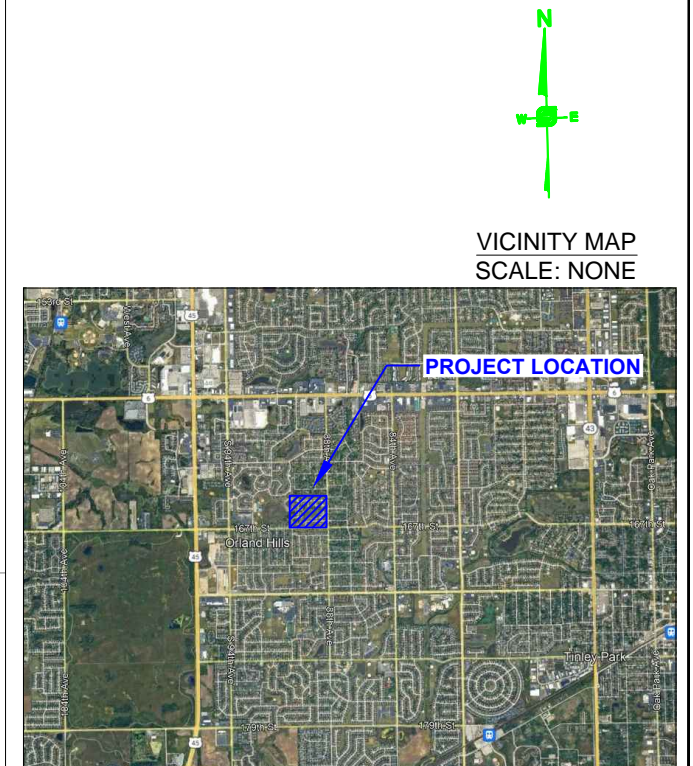
APPENDIX

1. **BORING LOCATION PLAN**
2. **GENERAL NOTES**
3. **BORING LOGS**
4. **UNIFIED SOIL CLASSIFICATION SYSTEM**
5. **COMPLETED LPC-663 FORM**
6. **GENERAL REMARKS**

APPENDIX 1

LEGEND

-  **B-1** APPROXIMATE BORING LOCATION
-  PROJECT LOCATION



NO.	DATE	REVISIONS	BY	DRAWN	SW
				DESIGNED	SW
				APPROVED	CWG

SEECO Consultants, Inc.
 7350 DuVan Drive, Tinley Park, Illinois 60477
 OFFICE: (708) 429-1666 FAX: (708) 429-1689

CLIENT
 Kirby School District 140

PROJECT NAME AND LOCATION
 Proposed New Fernway Park Elementary School
 Orland Park, IL

BORING
 LOCATION PLAN

DATE 1/6/2023
 SCALE NONE
 JOB NO. 13193G

SHEET
 1 OF 1

APPENDIX 2

DRILLING AND SAMPLING SYMBOLS

SS	SPLIT SPOON	1-3/8" I.D. x 2" O.D. (EXCEPT WHERE NOTED)
2T	THINWALL TUBE SAMPLER	2" O.D. x 1-7/8" I.D.
3T	THINWALL TUBE SAMPLER	3" O.D. x 2-7/8" I.D.
3P	PISTON SAMPLER	3" O.D. THINWALL TUBE
FA	CONTINUOUS FLIGHT AUGER	4" O.D.
HS	HOLLOW STEM AUGER	6-3/4" O.D. x 3-1/4" I.D.
HA	HAND AUGER	
RB	ROLLER ROCK BIT	
FT	FISHTAIL BIT	
DB	DIAMOND BIT	
AX	ROCK CORE	1-3/16" DIAMETER
BX	ROCK CORE	1-5/8" DIAMETER
NX	ROCK CORE	2-1/8" DIAMETER
AS	AUGER SAMPLE	
WS	WASH SAMPLE	
CA	COMBINED ANALYSIS	
SA	SIEVE ANALYSIS	

Standard "N" Penetration: Blows per foot of a 140 pound hammer falling 30 inches on a two inch O.D. split spoon, except where noted.

WATER LEVEL MEASUREMENT SYMBOLS

<u>▼</u>	WATER LEVEL OBSERVATION	WD	WHILE DRILLING
WCI	WET CAVE-IN	BCR	BEFORE CASING REMOVAL
DCI	DRY CAVE-IN	ACR	AFTER CASING REMOVAL
WS	WHILE SAMPLING	AB	AFTER BORING

Water levels indicated on the boring logs are the levels measured in the boring at the times indicated. In pervious soils, the indicated elevations are considered reliable groundwater levels. In impervious soils, the accurate determination of groundwater elevations are not possible in even several days observation, and additional evidence on groundwater elevations must be sought.

SOIL IDENTIFICATION TERMINOLOGY

COHESIONLESS SOILS

<u>COMPONENT</u>	<u>SIZE RANGE</u>	<u>DESCRIPTIVE TERM</u>	<u>PERCENT OF WEIGHT</u>
BOULDERS	OVER 8"	TRACE	0 – 10
COBBLES	8" TO 3"	LITTLE	10 – 20
GRAVEL	3" TO #4 SIEVE (4.75 mm)	SOME	20 – 35
SAND	#4 TO #200 SIEVE (0.074 mm)	AND	35 – 50
SILT	PASSING #200 SIEVE (0.074 mm)		

SOIL IDENTIFICATION TERMINOLOGY (Cont'd)

COHESIVE SOILS

<u>DESCRIPTIVE TERM</u>	<u>PLASTICITY INDEX</u>
CLAYEY SILT OR ORGANIC CLAYEY SILT	4 – 7
SILTY CLAY OR ORGANIC SILTY CLAY	8 – 30
CLAY OR ORGANIC CLAY	> 30

INTERMEDIATE SOILS

<u>DESCRIPTIVE TERM</u>	<u>PLASTICITY INDEX</u>
SILT	0 – 3

Unconfined compression tests are generally not applicable for intermediate soils.

CONSISTENCY OF COHESIVE SOILS

RELATIVE DENSITY OF GRANULAR SOILS

1-3/8" I.D. x 2" O.D. with 140 pound hammer falling 30"

<u>UNCONFINED COMP. STRENGTH, Qu, TSF</u>	<u>CONSISTENCY</u>	<u>N – BLOWS/FT.</u>	<u>RELATIVE DENSITY</u>
<0.25	VERY SOFT	0 – 3	VERY LOOSE
0.25 - 0.49	SOFT	4 – 9	LOOSE
0.50 - 1.00	MEDIUM	10 – 29	MEDIUM DENSE
1.01 - 1.99	STIFF	30 – 49	DENSE
2.00 - 3.99	VERY STIFF	50 – 80	VERY DENSE
4.00 - 8.00	HARD	>80	EXTREMELY DENSE
>8.00	VERY HARD		

CONSISTENCY OF COHESIVE SOILS

<u>N – BLOWS/FT.</u>	<u>RELATIVE DENSITY</u>
0 – 2	VERY SOFT
2 – 4	SOFT
4 – 8	MEDIUM
8 – 15	STIFF
15 – 30	VERY STIFF
>30	HARD

APPENDIX 3

BORING LOG

CLIENT Kirby School District 140	PROJECT Proposed New Fernway Park Elementary School
ARCHITECT Tria Architecture	LOCATION Orland Park, IL

DEPTH ELEVATION	SAMPLE NO.	SAMPLER TYPE	SAMPLE REC. (%)	SOIL GRAPHIC LOG	BORING NUMBER		OVM ppm	Unconfined Compressive Strength, Tons/Ft. ²					REMARKS																				
					B-1			<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 20%;">1</td> <td style="width: 20%;">2</td> <td style="width: 20%;">3</td> <td style="width: 20%;">4</td> <td style="width: 20%;">5</td> </tr> <tr> <td style="text-align: center;">PL</td> <td></td> <td style="text-align: center;">MC</td> <td></td> <td style="text-align: center;">LL</td> </tr> <tr> <td colspan="5" style="text-align: center;"> ▲ ————— × ————— ▲ STD "N" PENETRATION BLOWS PER FT. </td> </tr> <tr> <td style="text-align: center;">10</td> <td style="text-align: center;">20</td> <td style="text-align: center;">30</td> <td style="text-align: center;">40</td> <td style="text-align: center;">50</td> </tr> </table>						1	2	3	4	5	PL		MC		LL	▲ ————— × ————— ▲ STD "N" PENETRATION BLOWS PER FT.					10	20	30	40	50
					1	2		3	4	5																							
PL		MC		LL																													
▲ ————— × ————— ▲ STD "N" PENETRATION BLOWS PER FT.																																	
10	20	30	40	50																													
SURFACE ELEVATION (M.S.L.)		DESCRIPTION OF MATERIALS (LABORATORY CLASSIFICATION)																															
					705.0 +																												
					Northing	Easting																											
					DESCRIPTION OF MATERIALS (LABORATORY CLASSIFICATION)																												
					12" CLAY TOPSOIL, Black (6" Frost)																												
2.5	1	SS	42		SILTY CLAY, Some Brown, Trace Reddish Brown, Trace Sand and Gravel, Stiff to Very Stiff, Moist (CL)		0	⊗	×																								
5.0		HS																															
7.5	2	SS	50				0	⊗	×																								
7.5					End of Boring at 7 Feet																												
10.0					Note:																												
12.5					1. All the soil samples were screened with a MiniRae 3000 OVM photo-ionization detector (PID) and utilizing olfactory senses and no petroleum odors were observed in this boring with all PID readings 0.0 PPM.																												
15.0																																	
17.5																																	
20.0																																	
22.5																																	
25.0																																	
27.5																																	

⊗ Calibrated Penetrometer Unconfined Compression

Water Level Observations			SEECO Consultants, Inc. 7350 Duvan Drive, Tinley Park, IL 60477			Boring Started		12/27/22			
W.L.						Boring Completed		12/27/22			
W.L. Dry WSWD Dry ACR						Driller		EN	Rig		D-50
W.L.						Approved		CWG	Job No.		13193G

BORING LOG

CLIENT Kirby School District 140	PROJECT Proposed New Fernway Park Elementary School
ARCHITECT Tria Architecture	LOCATION Orland Park, IL

DEPTH ELEVATION	SAMPLE NO.	SAMPLER TYPE	SAMPLE REC. (%)	SOIL GRAPHIC LOG	BORING NUMBER		Unconfined Compressive Strength, Tons/Ft. ²					REMARKS	
					B-2		1 2 3 4 5						
					SURFACE ELEVATION (M.S.L.)		PL MC LL						
					Northing	Easting	10 20 30 40 50						
					DESCRIPTION OF MATERIALS (LABORATORY CLASSIFICATION)		STD "N" PENETRATION BLOWS PER FT.						
					FILL: 12" CLAY TOPSOIL, Black (6" Frost)								
2.5	1	SS	58	HS	FILL: SILTY CLAY, Brown and Gray, Trace Reddish Brown, Trace Sand and Gravel, Medium, Wet (CL)		0	⊗	⊗	⊗	⊗	⊗	
5.0	2	SS	42	HS	FILL: SILTY CLAY, Brown and Gray, Some Dark Gray, Trace Sand and Gravel, Soft, Wet (CL)		0	⊗	⊗	⊗	⊗	⊗	
7.5	3	SS	75	HS	SILTY CLAY, Brown and Gray, Trace Sand and Gravel, Very Stiff, Moist (CL)		0	⊗	⊗	⊗	⊗	⊗	
10.0	4	SS	75	HS	SILTY CLAY, Gray, Trace Sand and Gravel, Very Stiff to Stiff, Moist (CL)		0	⊗	⊗	⊗	⊗	⊗	
12.5	5	SS	42	HS	End of Boring at 15 Feet		0	⊗	⊗	⊗	⊗	⊗	
15.0					Note: 1. All the soil samples were screened with a MiniRae 3000 OVM photo-ionization detector (PID) and utilizing olfactory senses and no petroleum odors were observed in this boring with all PID readings 0.0 PPM.								

⊗ Calibrated Penetrometer Unconfined Compression

Water Level Observations			SEECO Consultants, Inc. 7350 Duvan Drive, Tinley Park, IL 60477 Approved CWG Job No. 13193G			Boring Started 12/27/22	
W.L.						Boring Completed 12/27/22	
W.L.	Dry WSWD	Dry ACR				Driller EN	Rig D-50
W.L.						Drawn By SW	Sheet 1 of 1

BORING LOG

CLIENT Kirby School District 140	PROJECT Proposed New Fernway Park Elementary School
ARCHITECT Tria Architecture	LOCATION Orland Park, IL

DEPTH ELEVATION	SAMPLE NO.	SAMPLER TYPE	SAMPLE REC. (%)	SOIL GRAPHIC LOG	BORING NUMBER B-3		OVM ppm	Unconfined Compressive Strength, Tons/Ft. ²					REMARKS
					SURFACE ELEVATION (M.S.L.)			1 2 3 4 5 PL MC LL					
					Northing	Easting		STD "N" PENETRATION BLOWS PER FT. 10 20 30 40 50					
					DESCRIPTION OF MATERIALS (LABORATORY CLASSIFICATION)								
		HS			12" CLAY TOPSOIL, Dark Brown and Brown								
2.5		SS 54			SILTY CLAY, Brown and Gray, Trace Sand and Gravel, Very Stiff to Stiff, Moist (CL)		0	⊗	×	⊗			
5.0	2	SS 50					0	⊗	⊗	×			
7.5	3	SS 42			SILTY CLAY, Brown and Gray, Trace Sand and Gravel, Very Stiff to Hard, Moist (CL)		0	⊗	⊗	×			
10.0	4	SS 75					0	⊗	×	⊗			
12.5		HS											
15.0	5	SS 92					0	×	⊗	⊗			
17.5					End of Boring at 15 Feet								
20.0					Note: 1. All the soil samples were screened with a MiniRae 3000 OVM photo-ionization detector (PID) and utilizing olfactory senses and no petroleum odors were observed in this boring with all PID readings 0.0 PPM.								

⊗ Calibrated Penetrometer Unconfined Compression

Water Level Observations			SEECO Consultants, Inc. 7350 Duvan Drive, Tinley Park, IL 60477			Boring Started		12/27/22				
W.L.						Boring Completed		12/27/22				
W.L. Dry WSWD		W.L. Dry ACR				Driller		EN	Rig		D-50	
W.L.						Approved CWG		Job No.	13193G		Drawn By SW	

BORING LOG

CLIENT Kirby School District 140	PROJECT Proposed New Fernway Park Elementary School
ARCHITECT Tria Architecture	LOCATION Orland Park, IL

DEPTH ELEVATION	SAMPLE NO.	SAMPLER TYPE	SAMPLE REC. (%)	SOIL GRAPHIC LOG	BORING NUMBER B-4		OVM ppm	Unconfined Compressive Strength, Tons/Ft. ²					REMARKS																														
					SURFACE ELEVATION (M.S.L.)			<table style="width: 100%; text-align: center; border-collapse: collapse;"> <tr> <td style="width: 20%;">1</td> <td style="width: 20%;">2</td> <td style="width: 20%;">3</td> <td style="width: 20%;">4</td> <td style="width: 20%;">5</td> </tr> <tr> <td>PL</td> <td></td> <td>MC</td> <td></td> <td>LL</td> </tr> <tr> <td colspan="5"> <table style="width: 100%; text-align: center;"> <tr> <td>▲</td> <td colspan="3">X</td> <td>▲</td> </tr> <tr> <td colspan="5">STD "N" PENETRATION BLOWS PER FT.</td> </tr> <tr> <td>10</td> <td>20</td> <td>30</td> <td>40</td> <td>50</td> </tr> </table> </td> </tr> </table>						1	2	3	4	5	PL		MC		LL	<table style="width: 100%; text-align: center;"> <tr> <td>▲</td> <td colspan="3">X</td> <td>▲</td> </tr> <tr> <td colspan="5">STD "N" PENETRATION BLOWS PER FT.</td> </tr> <tr> <td>10</td> <td>20</td> <td>30</td> <td>40</td> <td>50</td> </tr> </table>					▲	X			▲	STD "N" PENETRATION BLOWS PER FT.					10	20	30	40	50
					1	2		3	4	5																																	
					PL			MC		LL																																	
<table style="width: 100%; text-align: center;"> <tr> <td>▲</td> <td colspan="3">X</td> <td>▲</td> </tr> <tr> <td colspan="5">STD "N" PENETRATION BLOWS PER FT.</td> </tr> <tr> <td>10</td> <td>20</td> <td>30</td> <td>40</td> <td>50</td> </tr> </table>					▲	X			▲	STD "N" PENETRATION BLOWS PER FT.					10	20	30	40	50																								
▲	X			▲																																							
STD "N" PENETRATION BLOWS PER FT.																																											
10	20	30	40	50																																							
Northing		Easting																																									
DESCRIPTION OF MATERIALS (LABORATORY CLASSIFICATION)																																											
		HS			12" CLAY TOPSOIL, Dark Brown																																						
2.5		SS	42		SILTY CLAY, Dark Brown and Brown, Some Black, Trace Sand and Gravel, Very Stiff, Moist (CL)		0	⊗	⊗	⊗																																	
5.0	2	SS	67				0	⊗	⊗	⊗																																	
7.5	3	SS	50		SILTY CLAY, Brown and Gray, Trace Sand and Gravel, Very Stiff to Hard, Moist (CL)		0	⊗	⊗	⊗																																	
10.0	4	SS	67				0	⊗	⊗	⊗																																	
12.5		HS																																									
15.0	5	SS	75				0	⊗	⊗	⊗																																	
17.5		HS																																									
20.0	6	SS	92				0	⊗	⊗	⊗																																	
22.5					End of Boring at 20 Feet																																						
25.0					Note: 1. All the soil samples were screened with a MiniRae 3000 OVM photo-ionization detector (PID) and utilizing olfactory senses and no petroleum odors were observed in this boring with all PID readings 0.0 PPM.																																						

⊗ Calibrated Penetrometer Unconfined Compression

Water Level Observations			SEECO Consultants, Inc. 7350 Duvan Drive, Tinley Park, IL 60477			Boring Started		12/27/22		
W.L.						Boring Completed		12/27/22		
W.L. Dry WSWD		Dry ACR				Approved CWG		Job No. 13193G	Driller EN	Rig D-50
W.L.						Drawn By SW	Sheet 1 of 1			

BORING LOG

CLIENT Kirby School District 140	PROJECT Proposed New Fernway Park Elementary School
ARCHITECT Tria Architecture	LOCATION Orland Park, IL

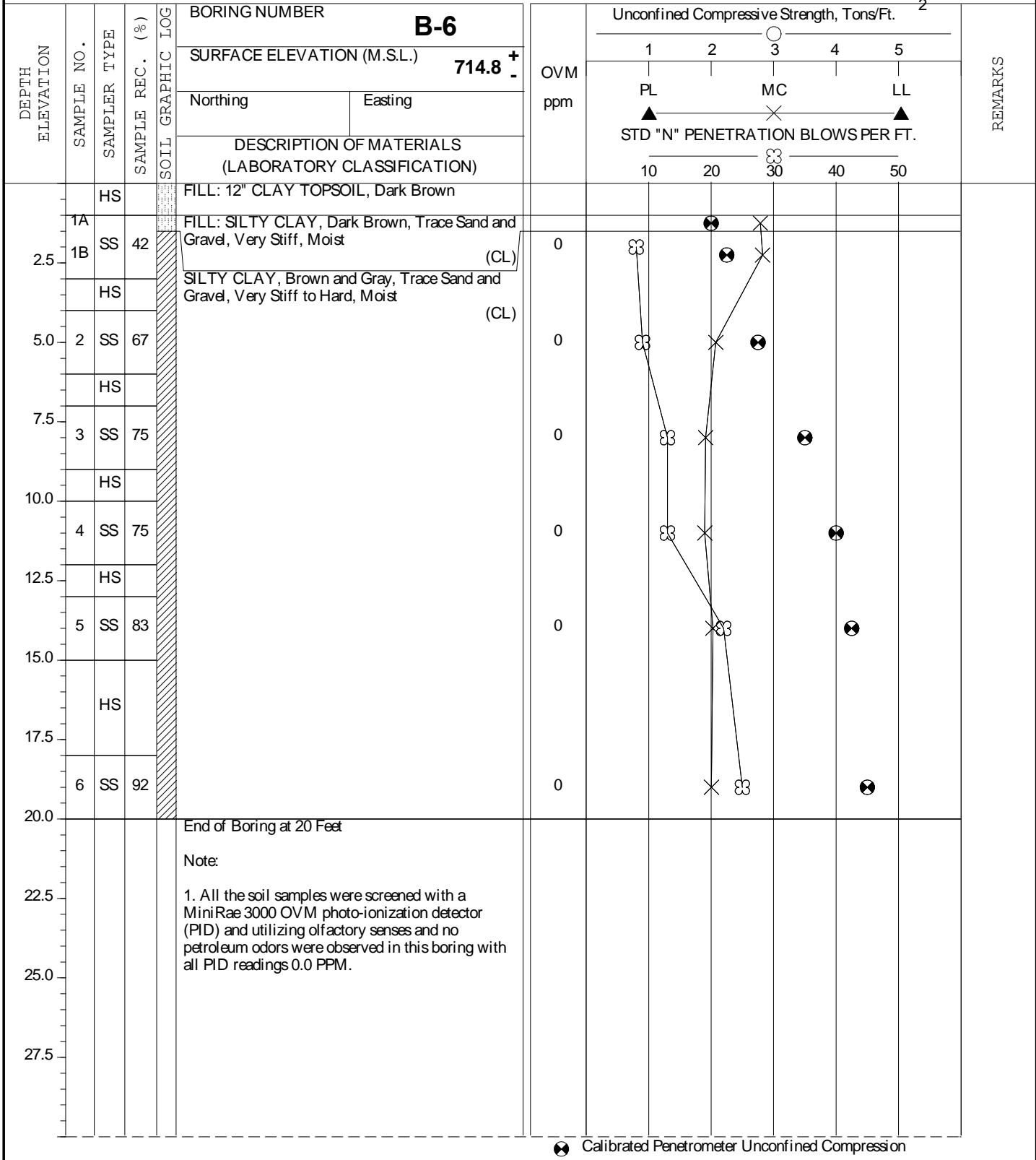
DEPTH ELEVATION	SAMPLE NO.	SAMPLER TYPE	SAMPLE REC. (%)	SOIL GRAPHIC LOG	BORING NUMBER B-5		OVM ppm	Unconfined Compressive Strength, Tons/Ft. ²					REMARKS
					SURFACE ELEVATION (M.S.L.)			1 2 3 4 5 PL MC LL ▲ × ▲ STD "N" PENETRATION BLOWS PER FT.					
					Northing	Easting		10 20 30 40 50					
					DESCRIPTION OF MATERIALS (LABORATORY CLASSIFICATION)								
				HS	FILL: 12" CLAY TOPSOIL, Dark Brown								
2.5	1	SS	50	HS	SILTY CLAY, Brown, Trace Sand and Gravel, Very Stiff, Moist (CL)		0	⊗	×	●			
5.0	2	SS	58	HS	SILTY CLAY, Brown, Trace Gray, Trace Sand and Gravel, Very Stiff to Hard, Moist (CL)		0	×	⊗	●			
7.5	3	SS	75	HS			0	×	⊗	●	⊗		
10.0	4	SS	83	HS			0	×	⊗	●	⊗		
12.5	5	SS	83	HS			0	×	⊗	●	⊗		
15.0					End of Boring at 15 Feet								
17.5					Note:								
20.0					1. All the soil samples were screened with a MiniRae 3000 OVM photo-ionization detector (PID) and utilizing olfactory senses and no petroleum odors were observed in this boring with all PID readings 0.0 PPM.								
22.5													
25.0													
27.5													

● Calibrated Penetrometer Unconfined Compression

Water Level Observations			SEECO Consultants, Inc. 7350 Duvan Drive, Tinley Park, IL 60477			Boring Started		12/27/22			
W.L.						Boring Completed		12/27/22			
W.L. Dry WSWD Dry ACR						Driller		EN	Rig		D-50
W.L.						Approved		CWG	Job No.		13193G
			Drawn By		SW	Sheet		1 of 1			

BORING LOG

CLIENT Kirby School District 140	PROJECT Proposed New Fernway Park Elementary School
ARCHITECT Tria Architecture	LOCATION Orland Park, IL



●× Calibrated Penetrometer Unconfined Compression

Water Level Observations			SEECO Consultants, Inc. 7350 Duvan Drive, Tinley Park, IL 60477			Boring Started 12/27/22	
W.L.						Boring Completed 12/27/22	
W.L.	Dry WSWD	Dry ACR				Driller EN	Rig D-50
W.L.			Approved CWG	Job No. 13193G	Drawn By SW	Sheet 1 of 1	

BORING LOG

CLIENT Kirby School District 140	PROJECT Proposed New Fernway Park Elementary School
ARCHITECT Tria Architecture	LOCATION Orland Park, IL

DEPTH ELEVATION	SAMPLE NO.	SAMPLER TYPE	SAMPLE REC. (%)	SOIL GRAPHIC LOG	BORING NUMBER		OVM ppm	Unconfined Compressive Strength, Tons/Ft. ²					REMARKS
					B-7			<div style="display: flex; justify-content: space-between; width: 100%;"> 12345 </div>					
					SURFACE ELEVATION (M.S.L.)			<div style="display: flex; justify-content: space-between; width: 100%;"> PLMCLL </div>					
					714.6 ±			<div style="display: flex; justify-content: space-between; width: 100%;"> 1020304050 </div>					
					Northing		Easting		STD "N" PENETRATION BLOWS PER FT.				
					(LABORATORY CLASSIFICATION)								
		HS			FILL: 12" CLAY TOPSOIL, Dark Brown								
2.5	1	SS	42		FILL: SILTY CLAY, Dark Brown, Brown, Trace Gray, Trace Sand and Gravel, Stiff, Moist (CL)		0	⊗	⊗	⊗			
5.0	2	SS	50		SILTY CLAY, Brown and Gray, Trace Sand and Gravel, Very Stiff to Hard, Moist (CL)		0	⊗	⊗	⊗			
7.5	3	SS	75				0	⊗	⊗	⊗			
10.0	4	SS	75				0	⊗	⊗	⊗			
12.5	5	SS	83				0	⊗	⊗	⊗			
15.0	6	SS	92				0	⊗	⊗	⊗			
20.0					End of Boring at 20 Feet								
22.5					Note:								
25.0					1. All the soil samples were screened with a MiniRae 3000 OVM photo-ionization detector (PID) and utilizing olfactory senses and no petroleum odors were observed in this boring with all PID readings 0.0 PPM.								
27.5													

⊗ Calibrated Penetrometer Unconfined Compression

Water Level Observations			SEECO Consultants, Inc. 7350 Duvan Drive, Tinley Park, IL 60477			Boring Started		12/27/22	
W.L.						Boring Completed		12/27/22	
W.L. Dry WSWD Dry ACR						Driller		EN Rig D-50	
W.L.						Approved CWG Job No. 13193G		Drawn By SW Sheet 1 of 1	

BORING LOG

CLIENT Kirby School District 140	PROJECT Proposed New Fernway Park Elementary School
ARCHITECT Tria Architecture	LOCATION Orland Park, IL

DEPTH ELEVATION	SAMPLE NO.	SAMPLER TYPE	SAMPLE REC. (%)	SOIL GRAPHIC LOG	BORING NUMBER B-8		OVM ppm	Unconfined Compressive Strength, Tons/Ft. ²					REMARKS
					SURFACE ELEVATION (M.S.L.) 715.0 ±			1	2	3	4	5	
					DESCRIPTION OF MATERIALS (LABORATORY CLASSIFICATION)								
					FILL: 12" CLAY TOPSOIL, Dark Brown (6" Frost)								
2.5	1	SS	58		SILTY CLAY, Dark Brown and Brown, Trace Sand and Gravel, Very Stiff, Moist (CL)	0	⊗	⊗					
5.0		HS											
7.5	2	SS	42			0	⊗	⊗					
7.5					End of Boring at 7 Feet								
10.0					Note:								
12.5					1. All the soil samples were screened with a MiniRae 3000 OVM photo-ionization detector (PID) and utilizing olfactory senses and no petroleum odors were observed in this boring with all PID readings 0.0 PPM.								
15.0													
17.5													
20.0													
22.5													
25.0													
27.5													

⊗ Calibrated Penetrometer Unconfined Compression

Water Level Observations			SEECO Consultants, Inc. 7350 Duvan Drive, Tinley Park, IL 60477			Boring Started		12/27/22		
W.L.						Boring Completed		12/27/22		
W.L. Dry WSWD Dry ACR						Driller		EN	Rig	
W.L.			Approved		CWG	Job No.		13193G	Drawn By SW Sheet 1 of 1	

BORING LOG

CLIENT Kirby School District 140	PROJECT Proposed New Fernway Park Elementary School
ARCHITECT Tria Architecture	LOCATION Orland Park, IL

DEPTH ELEVATION	SAMPLE NO.	SAMPLER TYPE	SAMPLE REC. (%)	SOIL GRAPHIC LOG	BORING NUMBER B-9		OVM ppm	Unconfined Compressive Strength, Tons/Ft. ²					REMARKS																														
					SURFACE ELEVATION (M.S.L.)			<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 20%; text-align: center;">1</td> <td style="width: 20%; text-align: center;">2</td> <td style="width: 20%; text-align: center;">3</td> <td style="width: 20%; text-align: center;">4</td> <td style="width: 20%; text-align: center;">5</td> </tr> <tr> <td style="text-align: center;">PL</td> <td></td> <td style="text-align: center;">MC</td> <td></td> <td style="text-align: center;">LL</td> </tr> <tr> <td colspan="5" style="text-align: center;"> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 20%; text-align: center;">▲</td> <td style="width: 20%; text-align: center;">×</td> <td style="width: 20%; text-align: center;">○</td> <td style="width: 20%; text-align: center;">×</td> <td style="width: 20%; text-align: center;">▲</td> </tr> <tr> <td colspan="5" style="text-align: center;">STD "N" PENETRATION BLOWS PER FT.</td> </tr> <tr> <td style="width: 20%; text-align: center;">10</td> <td style="width: 20%; text-align: center;">20</td> <td style="width: 20%; text-align: center;">30</td> <td style="width: 20%; text-align: center;">40</td> <td style="width: 20%; text-align: center;">50</td> </tr> </table> </td> </tr> </table>						1	2	3	4	5	PL		MC		LL	<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 20%; text-align: center;">▲</td> <td style="width: 20%; text-align: center;">×</td> <td style="width: 20%; text-align: center;">○</td> <td style="width: 20%; text-align: center;">×</td> <td style="width: 20%; text-align: center;">▲</td> </tr> <tr> <td colspan="5" style="text-align: center;">STD "N" PENETRATION BLOWS PER FT.</td> </tr> <tr> <td style="width: 20%; text-align: center;">10</td> <td style="width: 20%; text-align: center;">20</td> <td style="width: 20%; text-align: center;">30</td> <td style="width: 20%; text-align: center;">40</td> <td style="width: 20%; text-align: center;">50</td> </tr> </table>					▲	×	○	×	▲	STD "N" PENETRATION BLOWS PER FT.					10	20	30	40	50
					1	2		3	4	5																																	
					PL			MC		LL																																	
<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 20%; text-align: center;">▲</td> <td style="width: 20%; text-align: center;">×</td> <td style="width: 20%; text-align: center;">○</td> <td style="width: 20%; text-align: center;">×</td> <td style="width: 20%; text-align: center;">▲</td> </tr> <tr> <td colspan="5" style="text-align: center;">STD "N" PENETRATION BLOWS PER FT.</td> </tr> <tr> <td style="width: 20%; text-align: center;">10</td> <td style="width: 20%; text-align: center;">20</td> <td style="width: 20%; text-align: center;">30</td> <td style="width: 20%; text-align: center;">40</td> <td style="width: 20%; text-align: center;">50</td> </tr> </table>					▲	×	○	×	▲	STD "N" PENETRATION BLOWS PER FT.					10	20	30	40	50																								
▲	×	○	×	▲																																							
STD "N" PENETRATION BLOWS PER FT.																																											
10	20	30	40	50																																							
SURFACE ELEVATION (M.S.L.)																																											
DESCRIPTION OF MATERIALS (LABORATORY CLASSIFICATION)																																											
					12" CLAY TOPSOIL, Dark Brown (6" Frost)																																						
2.5	1	SS	58		SILTY CLAY, Brown and Gray, Trace Sand and Gravel, Very Stiff, Moist (CL)		0					Env. Sample																															
		HS																																									
5.0	2	SS	75				0																																				
		HS																																									
7.5	3	SS	67				0																																				
		HS																																									
10.0	4	SS	75				0																																				
		HS																																									
12.5		HS																																									
15.0	5	SS	75				0																																				
		HS																																									
17.5		HS																																									
20.0	6	SS	83				0																																				
		HS																																									
					End of Boring at 20 Feet																																						
22.5					Note:																																						
25.0					1. All the soil samples were screened with a MiniRae 3000 OVM photo-ionization detector (PID) and utilizing olfactory senses and no petroleum odors were observed in this boring with all PID readings 0.0 PPM.																																						
27.5					2. Sample 1 was discretely chosen to be environmental chemically tested for VOCs, SVOCs, Total 8 RCRA Metals, and pH by an independent environmental laboratory.																																						

● Calibrated Penetrometer Unconfined Compression

Water Level Observations			SEECO Consultants, Inc. 7350 Duvan Drive, Tinley Park, IL 60477 Approved CWG Job No. 13193G			Boring Started		12/27/22			
W.L.						Boring Completed		12/27/22			
W.L. Dry WSWD Dry ACR						Driller		EN	Rig		D-50
W.L.						Drawn By		SW	Sheet		1 of 1

BORING LOG

CLIENT Kirby School District 140	PROJECT Proposed New Fernway Park Elementary School
ARCHITECT Tria Architecture	LOCATION Orland Park, IL

DEPTH ELEVATION	SAMPLE NO.	SAMPLER TYPE	SAMPLE REC. (%)	SOIL GRAPHIC LOG	BORING NUMBER B-10		OVM ppm	Unconfined Compressive Strength, Tons/Ft. ²					REMARKS
					SURFACE ELEVATION (M.S.L.) 714.2 ±			1	2	3	4	5	
					Northing	Easting		PL	MC	LL			
					DESCRIPTION OF MATERIALS (LABORATORY CLASSIFICATION)			STD "N" PENETRATION BLOWS PER FT.					
								10	20	30	40	50	
12.5 15.0 17.5 20.0	1A 1B 2 3 4 5 6	HS SS SS SS SS SS SS	42 58 75 75 71 83		12" CLAY TOPSOIL, Dark Brown (6" Frost) SILTY CLAY, Dark Brown, Trace Sand and Gravel, Trace Roots, Very Stiff, Moist (CL) SILTY CLAY, Brown, Trace Gray, Trace Sand and Gravel, Very Stiff, Moist (CL) SILTY CLAY, Brown, Trace Sand and Gravel, Hard, Moist (CL) SILTY CLAY, Brown and Gray, Trace Sand and Gravel, Hard, Moist (CL)	0 0 0 0 0 0							
					End of Boring at 20 Feet								
					Note: 1. All the soil samples were screened with a MiniRae 3000 OVM photo-ionization detector (PID) and utilizing olfactory senses and no petroleum odors were observed in this boring with all PID readings 0.0 PPM.								

☉ Calibrated Penetrometer Unconfined Compression

Water Level Observations			SEECO Consultants, Inc. 7350 Duvan Drive, Tinley Park, IL 60477 Approved CWG Job No. 13193G			Boring Started 12/27/22			
W.L.						Boring Completed 12/27/22			
W.L.	Dry WSWD	Dry ACR				Driller	EN	Rig	D-50
W.L.						Drawn By	SW	Sheet	1 of 1

BORING LOG

CLIENT **Kirby School District 140**

PROJECT **Proposed New Fernway Park Elementary School**

ARCHITECT **Tria Architecture**

LOCATION **Orland Park, IL**

DEPTH ELEVATION	SAMPLE NO.	SAMPLER TYPE	SAMPLE REC. (%)	SOIL GRAPHIC LOG	BORING NUMBER B-11		OVM ppm	Unconfined Compressive Strength, Tons/Ft. ²					REMARKS
					SURFACE ELEVATION (M.S.L.) 716.6 ±			1	2	3	4	5	
					Northing	Easting		PL ————— MC ————— LL					
					DESCRIPTION OF MATERIALS (LABORATORY CLASSIFICATION)			▲ ————— X ————— ▲ STD "N" PENETRATION BLOWS PER FT.					
							10	20	30	40	50		
		HS			12" CLAY TOPSOIL, Dark Brown								
1.5	1A	SS	42		SILTY CLAY, Dark Brown, Trace Brown, Trace Crushed Stone, Trace Sand and Gravel, Very Stiff, Moist (CL)		0		X				
2.5	1B	SS	42						X				
3.5		HS			SILTY CLAY, Brown, Trace Sand and Gravel, Very Stiff, Moist (CL)		0		X				
4.5	2	SS	50						X				
6.5		HS			SILTY CLAY, Brown and Gray, Trace Sand and Gravel, Hard, Moist (CL)		0		X				
7.5	3	SS	54						X				
9.5		HS			SILTY CLAY, Brown and Gray, Trace Sand and Gravel, Hard, Moist (CL)		0		X				
10.5	4	SS	67						X				
12.5		HS			SILTY CLAY, Brown and Gray, Trace Sand and Gravel, Hard, Moist (CL)		0		X				
14.5	5	SS	50						X				
15.0	End of Boring at 15 Feet												
17.5	Note:												
20.0	1. All the soil samples were screened with a MiniRae 3000 OVM photo-ionization detector (PID) and utilizing olfactory senses and no petroleum odors were observed in this boring with all PID readings 0.0 PPM.												

Calibrated Penetrometer Unconfined Compression

Water Level Observations				SEECO Consultants, Inc. 7350 Duvan Drive, Tinley Park, IL 60477	Boring Started 12/27/22	
W.L.					Boring Completed 12/27/22	
W.L.	Dry WSWD	Dry ACR			Driller EN	Rig D-50
W.L.			Approved CWG	Job No. 13193G	Drawn By SW	Sheet 1 of 1

BORING LOG

CLIENT Kirby School District 140	PROJECT Proposed New Fernway Park Elementary School
ARCHITECT Tria Architecture	LOCATION Orland Park, IL

DEPTH ELEVATION	SAMPLE NO.	SAMPLER TYPE	SAMPLE REC. (%)	SOIL GRAPHIC LOG	BORING NUMBER B-12		OVM ppm	Unconfined Compressive Strength, Tons/Ft. ²					REMARKS
					SURFACE ELEVATION (M.S.L.)			1 2 3 4 5 PL MC LL ▲ × ▲ STD "N" PENETRATION BLOWS PER FT.					
					Northing	Easting		10 20 30 40 50					
					DESCRIPTION OF MATERIALS (LABORATORY CLASSIFICATION)								
					12" CLAY TOPSOIL, Dark Brown								
1A					SILTY CLAY, Dark Brown and Brown, Trace Sand and Gravel, Very Stiff, Moist		0						
2.5	1B	SS	67		(CL)		0						
					SILTY CLAY, Brown and Gray, Trace Sand and Gravel, Hard, Moist								
					(CL)								
5.0	2	SS	58				0						
7.5	3	SS	58				0						
10.0	4	SS	50				0						
12.5													
15.0	5	SS	42		SILTY CLAY, Brown, Trace Sand and Gravel, Very Stiff, Moist		0						
					(CL)								
					End of Boring at 15 Feet								
					Note:								
17.5					1. All the soil samples were screened with a MiniRae 3000 OVM photo-ionization detector (PID) and utilizing olfactory senses and no petroleum odors were observed in this boring with all PID readings 0.0 PPM.								
20.0													
22.5													
25.0													
27.5													

☉ Calibrated Penetrometer Unconfined Compression

Water Level Observations			SEECO Consultants, Inc. 7350 Duvan Drive, Tinley Park, IL 60477			Boring Started		12/27/22	
W.L.						Boring Completed		12/27/22	
W.L. Dry WSWD Dry ACR						Driller		EN Rig D-50	
W.L.						Approved CWG Job No. 13193G		Drawn By SW Sheet 1 of 1	

BORING LOG

CLIENT Kirby School District 140	PROJECT Proposed New Fernway Park Elementary School
ARCHITECT Tria Architecture	LOCATION Orland Park, IL

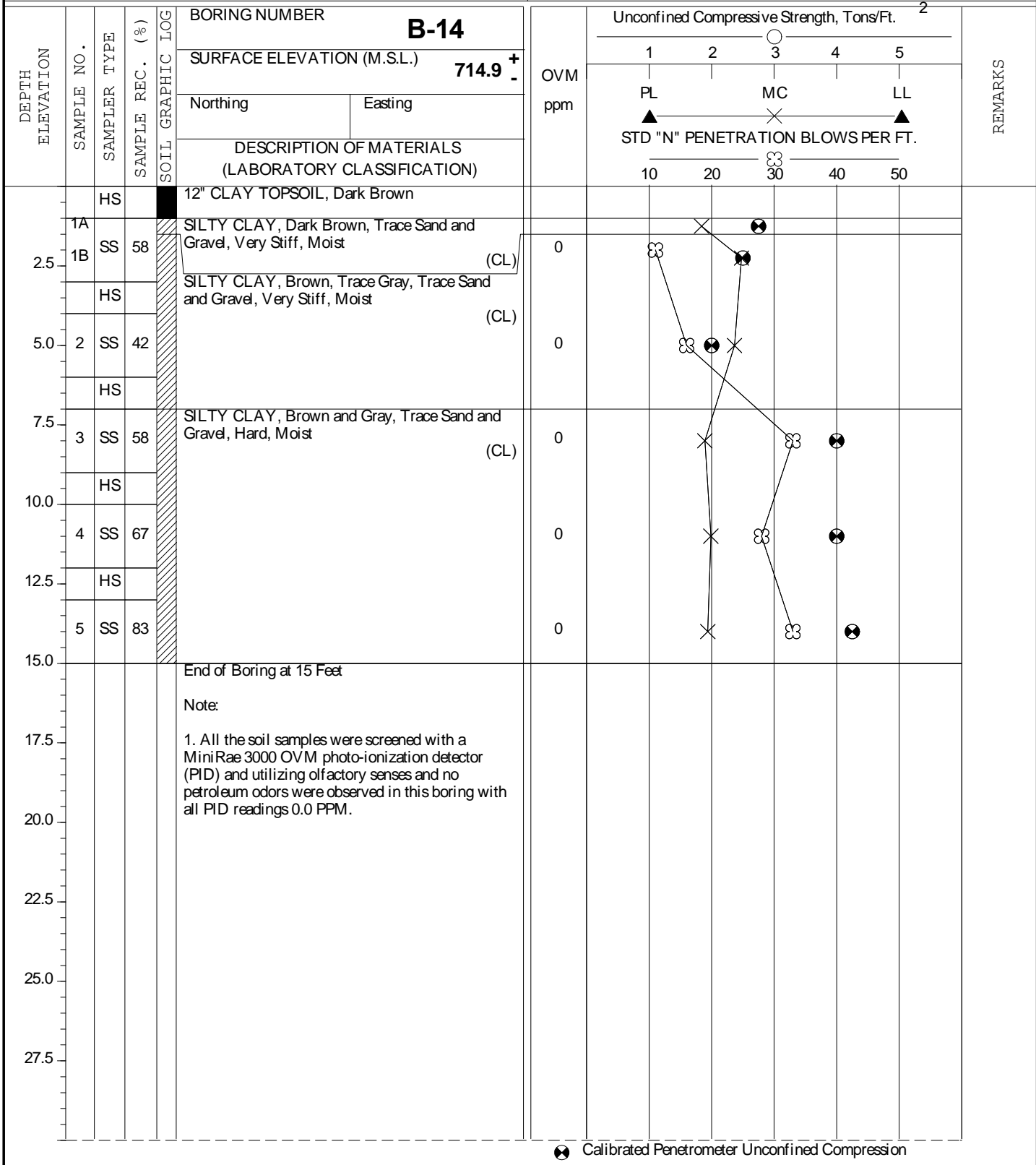
DEPTH ELEVATION	SAMPLE NO.	SAMPLER TYPE	SAMPLE REC. (%)	SOIL GRAPHIC LOG	BORING NUMBER B-13		OVM ppm	Unconfined Compressive Strength, Tons/Ft. ²					REMARKS	
					SURFACE ELEVATION (M.S.L.) 712.0 ±			1	2	3	4	5		
					Northing Easting									
					DESCRIPTION OF MATERIALS (LABORATORY CLASSIFICATION)									
					6.5" BITUMINOUS CONCRETE PAVEMENT									
					7.5" CRUSHED STONE BASE COURSE									
2.5	1	SS	58	HS	SILTY CLAY, Brown and Gray, Trace Sand and Gravel, Very Stiff to Hard, Moist (CL)		0	⊗	⊗	●				
5.0		HS												
7.5	2	SS	75	HS			0	⊗	⊗	●				
7.5					End of Boring at 7 Feet									
10.0					Note: 1. All the soil samples were screened with a MiniRae 3000 OVM photo-ionization detector (PID) and utilizing olfactory senses and no petroleum odors were observed in this boring with all PID readings 0.0 PPM.									
12.5														
15.0														
17.5														
20.0														
22.5														
25.0														
27.5														

● Calibrated Penetrometer Unconfined Compression

Water Level Observations			SEECO Consultants, Inc. 7350 Duvan Drive, Tinley Park, IL 60477			Boring Started		12/28/22			
W.L.						Boring Completed		12/28/22			
W.L. Dry WSWD Dry ACR						Driller		EN	Rig		D-50
W.L.						Approved		CWG	Job No.		13193G

BORING LOG

CLIENT Kirby School District 140	PROJECT Proposed New Fernway Park Elementary School
ARCHITECT Tria Architecture	LOCATION Orland Park, IL



☉ Calibrated Penetrometer Unconfined Compression

Water Level Observations			SEECO Consultants, Inc. 7350 Duvan Drive, Tinley Park, IL 60477			Boring Started 12/28/22	
W.L.						Boring Completed 12/28/22	
W.L.	Dry WSWD	Dry ACR				Driller EN	Rig D-50
W.L.			Approved CWG	Job No. 13193G	Drawn By SW	Sheet 1 of 1	

BORING LOG

CLIENT Kirby School District 140	PROJECT Proposed New Fernway Park Elementary School
ARCHITECT Tria Architecture	LOCATION Orland Park, IL

DEPTH ELEVATION	SAMPLE NO.	SAMPLER TYPE	SAMPLE REC. (%)	SOIL GRAPHIC LOG	BORING NUMBER		OVM ppm	Unconfined Compressive Strength, Tons/Ft. ²					REMARKS
					B-15			1	2	3	4	5	
					SURFACE ELEVATION (M.S.L.)			PL					
					714.7 ±			MC					
					Northing	Easting		LL					
					DESCRIPTION OF MATERIALS (LABORATORY CLASSIFICATION)			STD "N" PENETRATION BLOWS PER FT.					
								10	20	30	40	50	
		HS			3.5" BITUMINOUS CONCRETE PAVEMENT								
	1A				8.5" CRUSHED STONE BASE COURSE								
2.5	1B	SS	58		SILTY CLAY, Dark Brown, Trace Sand and Gravel, Stiff, Moist (CL)		0						
5.0		HS			SILTY CLAY, Brown and Gray, Trace Sand and Gravel, Very Stiff to Hard, Moist (CL)								
7.5	2	SS	75				0						
7.5					End of Boring at 7 Feet								
10.0					Note:								
12.5					1. All the soil samples were screened with a MiniRae 3000 OVM photo-ionization detector (PID) and utilizing olfactory senses and no petroleum odors were observed in this boring with all PID readings 0.0 PPM.								

☉ Calibrated Penetrometer Unconfined Compression

Water Level Observations			SEECO Consultants, Inc. 7350 Duvan Drive, Tinley Park, IL 60477	Boring Started		12/28/22		
W.L.				Boring Completed		12/28/22		
W.L. Dry WSWD		Dry ACR		Driller	EN	Rig	D-50	
W.L.				Approved	CWG	Job No.	13193G	
			Drawn By	SW	Sheet	1 of 1		

BORING LOG

CLIENT Kirby School District 140	PROJECT Proposed New Fernway Park Elementary School
ARCHITECT Tria Architecture	LOCATION Orland Park, IL

DEPTH ELEVATION	SAMPLE NO.	SAMPLER TYPE	SAMPLE REC. (%)	SOIL GRAPHIC LOG	BORING NUMBER B-16		OVM ppm	Unconfined Compressive Strength, Tons/Ft. ²					REMARKS
					SURFACE ELEVATION (M.S.L.) 714.5 ±			1	2	3	4	5	
					DESCRIPTION OF MATERIALS (LABORATORY CLASSIFICATION)								
					5" BITUMINOUS CONCRETE PAVEMENT								
					7" CRUSHED STONE BASE COURSE								
2.5	1A	SS	58		FILL: SILTY CLAY, Dark Brown and Gray, Trace Black, Trace Sand and Gravel, Very Stiff, Moist (CL)	0							
		HS			SILTY CLAY, Brown and Gray, Trace Sand and Gravel, Very Stiff, Moist (CL)	0							
5.0	2	SS	67			0							
		HS				0							
7.5	3	SS	50		CLAYEY SILT, Brown and Gray, Trace Sand, Loose, Moist (ML)	0							
		HS				0							
10.0	4	SS	58		SILTY CLAY, Brown, Trace Gray, Trace Sand and Gravel, Very Stiff to Hard, Moist (CL)	0							
		HS				0							
12.5	5	SS	75			0							
		HS				0							
15.0					End of Boring at 14 Feet								
17.5					Note:								
20.0					1. All the soil samples were screened with a MiniRae 3000 OVM photo-ionization detector (PID) and utilizing olfactory senses and no petroleum odors were observed in this boring with all PID readings 0.0 PPM.								
22.5													
25.0													
27.5													

☉ Calibrated Penetrometer Unconfined Compression

Water Level Observations			SEECO Consultants, Inc. 7350 Duvan Drive, Tinley Park, IL 60477			Boring Started		12/28/22		
W.L.						Boring Completed		12/28/22		
W.L. Dry WSWD Dry ACR						Driller		EN	Rig	
W.L.			Approved		CWG	Job No.		13193G	Drawn By SW Sheet 1 of 1	

BORING LOG

CLIENT Kirby School District 140	PROJECT Proposed New Fernway Park Elementary School
ARCHITECT Tria Architecture	LOCATION Orland Park, IL

DEPTH ELEVATION	SAMPLE NO.	SAMPLER TYPE	SAMPLE REC. (%)	SOIL GRAPHIC LOG	BORING NUMBER B-17		Unconfined Compressive Strength, Tons/Ft. ²					REMARKS
					SURFACE ELEVATION (M.S.L.)		1 2 3 4 5					
					715.5 ±							
					Northing	Easting	PL MC LL					
DESCRIPTION OF MATERIALS (LABORATORY CLASSIFICATION)					STD "N" PENETRATION BLOWS PER FT.							
					10 20 30 40 50							
		HS			FILL: SILTY CLAY, Dark Brown							
2.5	1	SS	42		SILTY CLAY, Brown and Gray, Trace Sand and Gravel, Very Stiff to Hard, Moist (CL)			⊗	×	⊗		
		HS										
5.0	2	SS	58					×	⊗			
		HS										
7.5	3	SS	75						×	⊗		
		HS										
10.0	4	SS	58		CLAYEY SAND, Brown and Gray, Trace Gravel, Loose, Saturated (SC)			⊗				▼ WCI ▼ WS
		HS										
12.5	5	SS	50		SILTY SAND, Gray, Trace Gravel, Loose, Saturated (SP)			⊗				
		HS										
15.0					End of Boring at 14 Feet							
17.5					Note: 1. All the soil samples were screened with a MiniRae 3000 OVM photo-ionization detector (PID) and utilizing olfactory senses and no petroleum odors were observed in this boring with all PID readings 0.0 PPM. 2. Wet Cave-in (WCI) of the saturated cohesionless sand soils occurred into the borehole after the removal of the hollow stem augers after completion of the borehole and is not a true groundwater level.							
20.0												
22.5												
25.0												
27.5												

⊗ Calibrated Penetrometer Unconfined Compression

Water Level Observations			SEECO Consultants, Inc. 7350 Duvan Drive, Tinley Park, IL 60477			Boring Started		12/28/22	
W.L.						Boring Completed		12/28/22	
W.L. 10' WS 8' WCI						Driller		EN Rig D-50	
W.L.						Approved CWG Job No. 13193G		Drawn By SW Sheet 1 of 1	

APPENDIX 4

CLASSIFICATION OF SOILS FOR ENGINEERING PURPOSES

ASTM Designation: D 2487-10

(Based on United Soil Classification System)

SEECO Consultants, Inc.

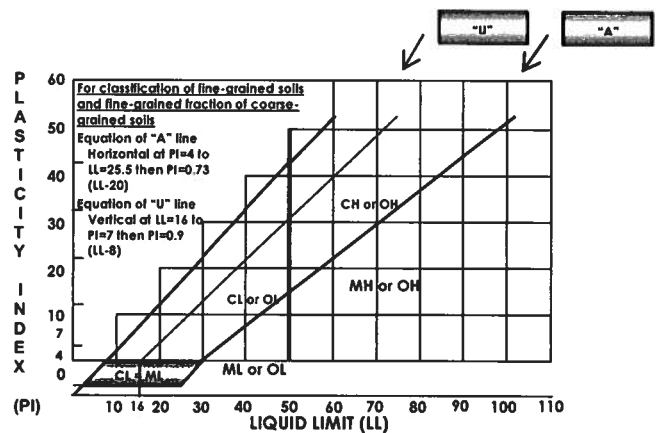
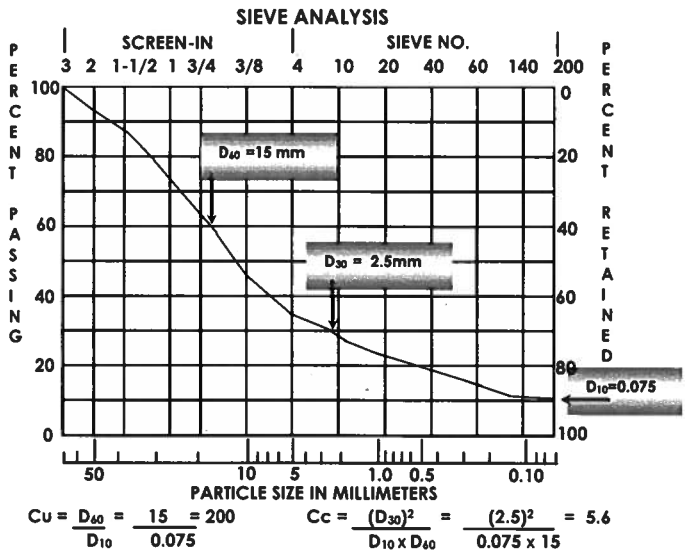
Criteria for Assigning Group Symbols and Group Names Using Laboratory Tests^A

			Soil Classification				
			Group Symbol	Group Name ^B			
Coarse Grained Soils More than 50% retained on No. 200 sieve	Gravels More than 50% coarse fraction retained on No. 4 sieve	Clean Gravels Less than 5% fines ^C	$Cu \geq 4$ and $1 \leq Cc \leq 3^E$	GW	Well graded gravel ^F		
			$Cu \geq 4$ and/or $1 > Cc > 3^E$	GP	Poorly graded gravel ^F		
		Gravels with fines More than 12% fines ^C	Fines classify as ML or MH	GM	Silty gravel ^{F, G, H}		
			Fines classify as CL or CH	GC	Clayey gravel ^{F, G, H}		
	Sands 50% or more of coarse fraction passes No. 4 sieve		$Cu \geq 6$ and $1 \leq Cc \leq 3^E$	SW	Well-graded sand ^I		
		Clean Sands Less than 5% fines ^D	$Cu < 6$ and /or $1 > Cc > 3^E$	SP	Poorly graded sand ^I		
		Sands with fines More than 12% fines ^D	Fines classify as ML or MH	SM	Silty sand ^{G, H, I}		
			Fines classify as CL or CH	SC	Clayey sand ^{G, H, I}		
	Fine-Grained Soils 50% or more passes the No. 200 sieve	Silts and Clays Liquid limit less than 50	Inorganic	$PI > 7$ and plots on or above "A" line ^J	CL	Lean clay ^{K, L, M}	
				$PI < 4$ or plots below "A" line ^J	ML	Silt ^{K, L, M}	
Organic			Liquid limit –oven dried <0.75	OL	Organic clay ^{K, L, M, N}		
			Liquid limit –not dried	OL	Organic silt ^{K, L, M, O}		
Silts and Clays Liquid limit 50 or more		Inorganic	PI plots on or above "A" line	CH	Fat clay ^{K, L, M}		
			PI plots below "A" line	MH	Elastic silt ^{K, L, M}		
		Organic	Liquid limit –oven dried <0.75	OH	Organic clay ^{K, L, M, P}		
			Liquid limit –not dried		Organic silt ^{K, L, M, Q}		
			Highly organic soils		Primarily organic matter, dark in color, and organic odor	PT	Peat

^ABased on the material passing the three inch (75 MM) sieve
^BIf field sample contained cobbles or boulders, or both, add "with cobbles or boulders, or both" to group name
^CGravels with 5 to 12% fines require dual symbols:
 GW-GM well-graded gravel with silt
 GW-GC well-graded gravel with clay
 GP-GM poorly graded gravel with silt
 GP-GC poorly graded gravel with clay

^DSands with 5 to 12% fines require dual symbols:
 SW-SM well-graded sand with silt
 SW-SC well-graded sand with clay
 SP-SM poorly graded sand with silt
 SP-SC poorly graded sand with clay
^E $Cu = D_{60}/D_{10}$ $Cc = \frac{(D_{30})^2}{D_{10} \times D_{60}}$
^FIf soil contains $\geq 15\%$ sand, add "with sand" to group name
^GIf fines classify as CL-ML, use dual symbol GC-GM, or SC-SM
^HIf fines are organic, add "with organic fines" to group name
^IIf soils contains $\geq 15\%$ gravel, add "with gravel" to group name

^JIf Atterberg limits plot in hatched area, soil is a CL-ML, silty clay
^KIf soil contains 15 to 29% plus No. 200, add "with sand" or "with gravel," whichever is predominant
^LIf soil contains $\geq 30\%$ plus No. 200, predominantly sand, add "sandy" to group name
^MIf soil contains $\geq 30\%$ plus No. 200, predominantly gravel, add "gravelly" to group name
^N $PI \geq 4$ and plots on or above "A" line
^O $PI < 4$ or plots below "A" line
^P PI plots on or above "A" line
^Q PI plots below "A" line



APPENDIX 5



Illinois Environmental Protection Agency

1021 North Grand Avenue East • P.O. Box 19276 • Springfield • Illinois • 62794-9276 • (217) 782-3397

Uncontaminated Soil Certification by Licensed Professional Engineer or Licensed Professional Geologist for Use of Uncontaminated Soil as Fill in a CCDD or Uncontaminated Soil Fill Operation LPC-663

Revised in accordance with 35 Ill. Adm. Code 1100, as amended by PCB R2012-009 (eff. Aug. 27, 2012)

This certification form is to be used by professional engineers and professional geologists to certify, pursuant to 35 Ill. Adm. Code 1100.205(a)(1)(B), that soil (i) is uncontaminated soil and (ii) is within a pH range of 6.26 to 9.0. If you have questions about this form, please telephone the Bureau of Land Permit Section at 217/524-3300.

This form may be completed online, saved locally, printed and signed, and submitted to prospective clean construction or demolition debris (CCDD) fill operations or uncontaminated soil fill operations.

I. Source Location Information

(Describe the location of the source of the uncontaminated soil)

Project Name: New Fernway Park Elementary School Office Phone Number, if available: _____

Physical Site Location (address, including number and street):

16600 S. 88th Ave.

City: Orland Park State: IL Zip Code: 60462

County: Cook Township: Orland

Lat/Long of approximate center of site in decimal degrees (DD.ddddd) to five decimal places (e.g., 40.67890, -90.12345):

Latitude: 41.58868 Longitude: - 87.83516

(Decimal Degrees)

(-Decimal Degrees)

Identify how the lat/long data were determined:

GPS Map Interpolation Photo Interpolation Survey Other

IEPA Site Number(s), if assigned: BOL: _____ BOW: _____ BOA: _____

Approximate Start Date (mm/dd/yyyy): _____ Approximate End Date (mm/dd/yyyy): _____

Estimated Volume of debris (cu. Yd.): _____

II. Owner/Operator Information for Source Site

Site Owner

Name: Kirby School District 140

Street Address: 16931 S. Grissom Drive

PO Box: _____

City: Tinley Park State: IL

Zip Code: 60477 Phone: (708) 532-6462

Contact: Michael Andreshak

Email, if available: _____

Site Operator

Name: Kirby School District 140

Street Address: 16931 S. Grissom Drive

PO Box: _____

City: Tinley Park State: IL

Zip Code: 60477 Phone: (708) 532-6462

Contact: Michael Andreshak

Email, if available: _____

This Agency is authorized to require this information under Section 4 and Title X of the Environmental Protection Act (415 ILCS 5/4, 5/39). Failure to disclose this information may result in: a civil penalty of not to exceed \$50,000 for the violation and an additional civil penalty of not to exceed \$10,000 for each day during which the violation continues (415 ILCS 5/42). This form has been approved by the Forms Management Center.

Uncontaminated Soil Certification

III. Basis for Certification and Attachments

For each item listed below, reference the attachments to this form that provide the required information.

- a. A Description of the soil sample points and how they were determined to be sufficient in number and appropriately located 35 Ill. Adm. Code 1100.610(a):

Performed 17 soil borings (B-1 to B-17) & sample from Boring B-9 at 2' was selected for chemical analysis. Matls certified as CCDD material must be free of rebar, garbage, odors, etc. & any said matls must be segregated from CCDD materials. Boring logs and a location plan are attached. Area at northeast corner of existing school is excluded from CCDD Certification. See aerial

- b. Analytical soil testing results to show that soil chemical constituents comply with the maximum allowable concentrations established pursuant to 35 Ill. Adm. Code Part 1100, Subpart F and that the soil pH is within the range of 6.25 to 9.0, including the documentation of chain of custody control, a copy of the lab analysis; the accreditation status of the laboratory performing the analysis; and certification by an authorized agent of the laboratory that the analysis has been performed in accordance with the Agency's rules for the accreditation of environmental and the scope of the accreditation [35 Ill. Adm. Code 1100.201(g), 1100.205(a), 1100.610]:

SEECO screened for volatile organics using a Photo Ionization Detector which indicates the presence of volatile organics in parts per million (ppm). No readings indicated the presence of volatile organics associated with contamination at the locations tested. Laboratory analysis were within the MAC range set forth by the IEPA and soil pH range is acceptable (results attached).

IV. Certification Statement, Signature and Seal of Licensed Professional Engineer or Licensed Professional Geologist


I, Garrett Gray, PE (name of licensed professional engineer or geologist)

certify under penalty of law that the information submitted, including but not limited to, all attachments and other information, is to the best of my knowledge and belief, true, accurate and complete. In accordance with the Environmental Protection Act [415 ILCS 5/22.51 or 22.51a] and 35 Ill. Adm. Code 1100.205(a), I certify that the soil from this site is uncontaminated soil. I also certify that the soil pH is within the range of 6.25 to 9.0. In addition, I certify that the soil has not been removed from the site as part of a cleanup or removal of contaminants. All necessary documentation is attached.

Any person who knowingly makes a false, fictitious, or fraudulent material statement, orally or in writing, to the Illinois EPA commits a Class 4 felony. A second or subsequent offense after conviction is a Class 3 felony. (415 ILCS 5/44(h))

Company Name: SEECO Environmental Services, Inc.
Street Address: 7350 Duvan Drive
City: Tinley Park State: IL Zip Code: 60477
Phone: 708-429-1685

Garrett Gray, PE
Printed Name: _____


Licensed Professional Engineer or
Licensed Professional Geologist Signature:

Jan 16, 2023
Date:



Ferway Park School CCDD Exclusion Zone


Write a description for your map.

Legend

-  Exclusion Zone
-  Exclusion Zone
-  Ferway Park Elementary School

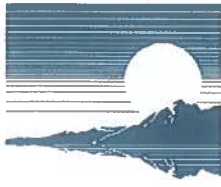
166th St

88th Ave

 Exclusion Zone



100 ft



January 06, 2023

Mr. Don Cassier
SEECO ENVIRONMENTAL SERVICES
7350 Duvan Drive
Tinley Park, IL 60477

Project ID: 13193
First Environmental File ID: 22-9831
Date Received: December 28, 2022

Dear Mr. Don Cassier:

The above referenced project was analyzed as directed on the enclosed chain of custody record.

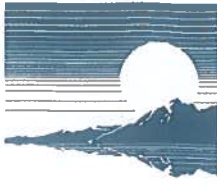
All Quality Control criteria as outlined in the methods and current IL ELAP/NELAP have been met unless otherwise noted. QA/QC documentation and raw data will remain on file for future reference. Our accreditation number is 100292 and our current certificate is number:

1002922022-8: effective 02/10/2022 through 02/28/2023.

I thank you for the opportunity to be of service to you and look forward to working with you again in the future. Should you have any questions regarding any of the enclosed analytical data or need additional information, please contact me at (630) 778-1200.

Sincerely,

Ryan Gerrick
Project Manager



Case Narrative

SEECO ENVIRONMENTAL SERVICES

Lab File ID: **22-9831**

Project ID: **13193**

Date Received: **December 28, 2022**

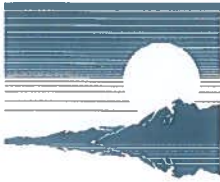
All quality control criteria, as outlined in the methods, have been met except as noted below or on the following analytical report.

The results in this report apply to the samples in the following table:

Laboratory Sample ID	Client Sample Identifier	Date/Time Collected
22-9831-001	B9 2'	12/27/2022 13:00

Sample Batch Comments:

Method 5035 vials for soil VOCs were not received. Samples preserved in lab.



Case Narrative

SEECO ENVIRONMENTAL SERVICES

Lab File ID: **22-9831**

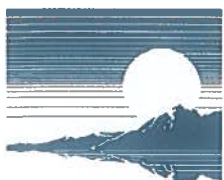
Project ID: **13193**

Date Received: **December 28, 2022**

All quality control criteria, as outlined in the methods, have been met except as noted below or on the following analytical report.

The following is a definition of flags that may be used in this report:

Flag	Description	Flag	Description
A	Method holding time is 15 minutes from collection. Lab analysis was performed as soon as possible.		
B	Analyte was found in the method blank.	L	LCS recovery outside control limits.
<	Analyte not detected at or above the reporting limit.	M	MS recovery outside control limits; LCS acceptable.
C	Sample received in an improper container for this test.	P	Chemical preservation pH adjusted in lab.
D	Surrogates diluted out; recovery not available.	Q	Result was determined by a GC/MS database search.
E	Estimated result; concentration exceeds calibration range.	S	Analysis was subcontracted to another laboratory.
G	Surrogate recovery outside control limits.	T	Result is less than three times the MDL value.
H	Analysis or extraction holding time exceeded.	W	Reporting limit elevated due to sample matrix.
I	ICVS % rec outside 95-105% but within 90-110%		
J	Estimated result; concentration is less than routine RL but greater than MDL.	N	Analyte is not part of our NELAC accreditation or accreditation may not be available for this parameter.
RL	Routine Reporting Limit (Lowest amount that can be detected when routine weights/volumes are used without dilution.)	ND	Analyte was not detected using a library search routine; No calibration standard was analyzed.

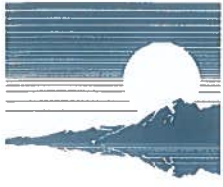


Analytical Report

Client: SEECO ENVIRONMENTAL SERVICES	Date Collected: 12/27/22
Project ID: 13193	Time Collected: 13:00
Sample ID: B9 2'	Date Received: 12/28/22
Sample No: 22-9831-001	Date Reported: 01/06/23

Results are reported on a dry weight basis.

Analyte	Result	R.L.	Units	Flags
Solids, Total		Method: 2540G 2011		
Analysis Date: 12/29/22				
Total Solids	81.76		%	
Volatile Organic Compounds		Method: 5035A/8260B		
Analysis Date: 01/05/23				
Acetone	< 200	200	ug/kg	
Benzene	< 5.0	5.0	ug/kg	
Bromodichloromethane	< 5.0	5.0	ug/kg	
Bromoform	< 5.0	5.0	ug/kg	
Bromomethane	< 10.0	10.0	ug/kg	
2-Butanone (MEK)	< 100	100	ug/kg	
Carbon disulfide	< 5.0	5.0	ug/kg	
Carbon tetrachloride	< 5.0	5.0	ug/kg	
Chlorobenzene	< 5.0	5.0	ug/kg	
Chlorodibromomethane	< 5.0	5.0	ug/kg	
Chloroethane	< 10.0	10.0	ug/kg	
Chloroform	< 5.0	5.0	ug/kg	
Chloromethane	< 10.0	10.0	ug/kg	
1,1-Dichloroethane	< 5.0	5.0	ug/kg	
1,2-Dichloroethane	< 5.0	5.0	ug/kg	
1,1-Dichloroethene	< 5.0	5.0	ug/kg	
cis-1,2-Dichloroethene	< 5.0	5.0	ug/kg	
trans-1,2-Dichloroethene	< 5.0	5.0	ug/kg	
1,2-Dichloropropane	< 5.0	5.0	ug/kg	
cis-1,3-Dichloropropene	< 4.0	4.0	ug/kg	
trans-1,3-Dichloropropene	< 4.0	4.0	ug/kg	
Ethylbenzene	< 5.0	5.0	ug/kg	
2-Hexanone	< 10.0	10.0	ug/kg	
Methyl-tert-butylether (MTBE)	< 5.0	5.0	ug/kg	
4-Methyl-2-pentanone (MIBK)	< 10.0	10.0	ug/kg	
Methylene chloride	< 20.0	20.0	ug/kg	
Styrene	< 5.0	5.0	ug/kg	
1,1,2,2-Tetrachloroethane	< 5.0	5.0	ug/kg	
Tetrachloroethene	< 5.0	5.0	ug/kg	
Toluene	< 5.0	5.0	ug/kg	
1,1,1-Trichloroethane	< 5.0	5.0	ug/kg	
1,1,2-Trichloroethane	< 5.0	5.0	ug/kg	
Trichloroethene	< 5.0	5.0	ug/kg	

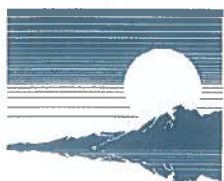


Analytical Report

Client:	SEECO ENVIRONMENTAL SERVICES	Date Collected:	12/27/22
Project ID:	13193	Time Collected:	13:00
Sample ID:	B9 2'	Date Received:	12/28/22
Sample No:	22-9831-001	Date Reported:	01/06/23

Results are reported on a dry weight basis.

Analyte	Result	R.L.	Units	Flags
Volatile Organic Compounds		Method: 5035A/8260B		
Analysis Date: 01/05/23				
Vinyl acetate	< 10.0	10.0	ug/kg	
Vinyl chloride	< 10.0	10.0	ug/kg	
Xylene, Total	< 5.0	5.0	ug/kg	
Semi-Volatile Compounds		Method: 8270C		Preparation Method 3540C
Analysis Date: 01/05/23				
Preparation Date: 01/03/23				
Acenaphthene	< 330	330	ug/kg	
Acenaphthylene	< 330	330	ug/kg	
Anthracene	< 330	330	ug/kg	
Benzidine	< 330	330	ug/kg	
Benzo(a)anthracene	< 330	330	ug/kg	
Benzo(a)pyrene	< 90	90	ug/kg	
Benzo(b)fluoranthene	< 330	330	ug/kg	
Benzo(k)fluoranthene	< 330	330	ug/kg	
Benzo(ghi)perylene	< 330	330	ug/kg	
Benzoic acid	< 330	330	ug/kg	
Benzyl alcohol	< 330	330	ug/kg	
bis(2-Chloroethoxy)methane	< 330	330	ug/kg	
bis(2-Chloroethyl)ether	< 330	330	ug/kg	
bis(2-Chloroisopropyl)ether	< 330	330	ug/kg	
bis(2-Ethylhexyl)phthalate	< 330	330	ug/kg	
4-Bromophenyl phenyl ether	< 330	330	ug/kg	
Butyl benzyl phthalate	< 330	330	ug/kg	
Carbazole	< 330	330	ug/kg	
4-Chloroaniline	< 330	330	ug/kg	
4-Chloro-3-methylphenol	< 330	330	ug/kg	
2-Chloronaphthalene	< 330	330	ug/kg	
2-Chlorophenol	< 330	330	ug/kg	
4-Chlorophenyl phenyl ether	< 330	330	ug/kg	
Chrysene	< 330	330	ug/kg	
Dibenzo(a,h)anthracene	< 90	90	ug/kg	
Dibenzofuran	< 330	330	ug/kg	
1,2-Dichlorobenzene	< 330	330	ug/kg	
1,3-Dichlorobenzene	< 330	330	ug/kg	
1,4-Dichlorobenzene	< 330	330	ug/kg	
3,3'-Dichlorobenzidine	< 660	660	ug/kg	
2,4-Dichlorophenol	< 330	330	ug/kg	

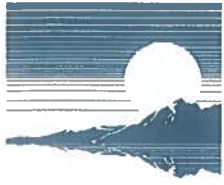


Analytical Report

Client:	SEECO ENVIRONMENTAL SERVICES	Date Collected:	12/27/22
Project ID:	13193	Time Collected:	13:00
Sample ID:	B9 2'	Date Received:	12/28/22
Sample No:	22-9831-001	Date Reported:	01/06/23

Results are reported on a dry weight basis.

Analyte	Result	R.L.	Units	Flags
Semi-Volatile Compounds				
Analysis Date: 01/05/23				
	Method: 8270C		Preparation Method 3540C	
			Preparation Date: 01/03/23	
Diethyl phthalate	< 330	330	ug/kg	
2,4-Dimethylphenol	< 330	330	ug/kg	
Dimethyl phthalate	< 330	330	ug/kg	
Di-n-butyl phthalate	< 330	330	ug/kg	
4,6-Dinitro-2-methylphenol	< 1,600	1600	ug/kg	
2,4-Dinitrophenol	< 1,600	1600	ug/kg	
2,4-Dinitrotoluene	< 250	250	ug/kg	
2,6-Dinitrotoluene	< 260	260	ug/kg	
Di-n-octylphthalate	< 330	330	ug/kg	
Fluoranthene	< 330	330	ug/kg	
Fluorene	< 330	330	ug/kg	
Hexachlorobenzene	< 330	330	ug/kg	
Hexachlorobutadiene	< 330	330	ug/kg	
Hexachlorocyclopentadiene	< 330	330	ug/kg	
Hexachloroethane	< 330	330	ug/kg	
Indeno(1,2,3-cd)pyrene	< 330	330	ug/kg	
Isophorone	< 330	330	ug/kg	
2-Methylnaphthalene	< 330	330	ug/kg	
2-Methylphenol	< 330	330	ug/kg	
3 & 4-Methylphenol	< 330	330	ug/kg	
Naphthalene	< 330	330	ug/kg	
2-Nitroaniline	< 1,600	1600	ug/kg	
3-Nitroaniline	< 1,600	1600	ug/kg	
4-Nitroaniline	< 1,600	1600	ug/kg	
Nitrobenzene	< 260	260	ug/kg	
2-Nitrophenol	< 1,600	1600	ug/kg	
4-Nitrophenol	< 1,600	1600	ug/kg	
n-Nitrosodi-n-propylamine	< 90	90	ug/kg	
n-Nitrosodimethylamine	< 330	330	ug/kg	
n-Nitrosodiphenylamine	< 330	330	ug/kg	
Pentachlorophenol	< 330	330	ug/kg	
Phenanthrene	< 330	330	ug/kg	
Phenol	< 330	330	ug/kg	
Pyrene	< 330	330	ug/kg	
Pyridine	< 330	330	ug/kg	
1,2,4-Trichlorobenzene	< 330	330	ug/kg	
2,4,5-Trichlorophenol	< 330	330	ug/kg	



Analytical Report

Client: SEECO ENVIRONMENTAL SERVICES	Date Collected: 12/27/22
Project ID: 13193	Time Collected: 13:00
Sample ID: B9 2'	Date Received: 12/28/22
Sample No: 22-9831-001	Date Reported: 01/06/23

Results are reported on a dry weight basis.

Analyte	Result	R.L.	Units	Flags
Semi-Volatile Compounds				
Method: 8270C		Preparation Method 3540C		
Analysis Date: 01/05/23		Preparation Date: 01/03/23		
2,4,6-Trichlorophenol	< 330	330	ug/kg	
Total Metals				
Method: 6010C		Preparation Method 3050B		
Analysis Date: 01/05/23		Preparation Date: 01/03/23		
Arsenic	10.1	1.0	mg/kg	
Barium	121	0.5	mg/kg	
Cadmium	< 0.5	0.5	mg/kg	
Chromium	18.4	0.5	mg/kg	
Lead	19.9	0.5	mg/kg	
Selenium	< 1.0	1.0	mg/kg	
Silver	< 0.2	0.2	mg/kg	
Total Mercury				
Method: 7471B				
Analysis Date: 01/05/23				
Mercury	0.05	0.05	mg/kg	
pH @ 25°C, 1:2				
Method: 9045D				
Analysis Date: 12/29/22 12:40				
pH @ 25°C, 1:2	7.96		Units	



First Environmental Laboratories, Inc.

1600 Shore Road, Suite D
 Naperville, IL 60563
 Phone: (630)778-1200 * Fax (630)778-1233
 E-Mail: fristinfo@firstenv.com
 IEPA Accreditation #100292
www.firstenv.com

CHAIN OF CUSTODY RECORD

Company Name: SEECO	
Street Address:	
City:	State:
Phone:	e-Mail: cassier@seeco.com
Send Report To:	Hardcopy: <input type="checkbox"/>
Sampled By: RD	PDF e-Mail: <input checked="" type="checkbox"/>

Date/Time Taken	Sample Description	Matrix*	pH	Total 8 RCRA Metals	VOCs	SVOCs	HOLD-Do not analyze	Comments	Lab I.D.
12/17/10	B9 2-	S	7.8					22-9831	001

FOR LAB USE ONLY:
 Cooler Temperature: 0-16°C Yes No °C
 Received within 6 hrs of collection: _____
 Ice Present: Yes No

FOR LAB COURIER USE ONLY:
 Sample Refrigerated: Yes No °C
 Refrigerator Temperature: _____
 Program: TACO/SRP CCDD NPDES LUST SDWA
 *Matrix Code Key: DW-drinking water GW-groundwater WW-wastewater
 S-soil SL-sludge WIPE-wipe O-other

Notes and Special Instructions:

Relinquished By: _____ Date/Time: 12/28/10

Relinquished By: _____ Date/Time: 12/28/10

Received By: **Alan Skordina** Date/Time: 12/28/10

Received By: _____ Date/Time: _____

Rev 10/19

fernway

prepared for:
Ref:

2023-01-16

Environmental Radius Report

NETRONLINE

2055 E. Rio Salado Pkwy
Tempe, AZ 85381
480-967-6752

Summary

Federal

	< 1/4	1/4 - 1/2	1/2 - 1
Lists of Federal NPL (Superfund) sites	0	0	0
Lists of Federal Delisted NPL sites	0	0	-
Lists of Federal sites subject to CERCLA removals and CERCLA orders	0	0	-
Lists of Federal CERCLA sites with NFRAP	0	0	-
Lists of Federal RCRA facilities undergoing Corrective Action	0	0	-
Lists of Federal RCRA TSD facilities	0	0	-
Lists of Federal RCRA generators	0	-	-
Federal institutional control/engineering control registries	0	-	-
Federal ERNS list	0	-	-

State

	< 1/4	1/4 - 1/2	1/2 - 1
Lists of state and tribal Superfund equivalent sites	0	0	0
Lists of state and tribal hazardous waste facilities	1	1	-
Lists of state and tribal landfills and solid waste disposal facilities	0	0	-
Lists of state and tribal leaking storage tanks	0	0	-
Lists of state and tribal registered storage tanks	0	-	-
State and tribal institutional control/engineering control registries	1	-	-
Lists of state and tribal voluntary cleanup sites	1	0	-
Lists of state and tribal brownfields sites	0	0	-

Other

	< 1/4	1/4 - 1/2	1/2 - 1
State and/or tribal lists of permitted facilities	2	-	-
Resource Conservation and Recovery Act Information (RCRAInfo)	1	1	-
U.S. EPA Underground Storage Tanks (UST)	0	-	-

Lists of Federal NPL (Superfund) sites

The National Priorities List (NPL) is the list of sites of national priority among the known releases or threatened releases of hazardous substances, pollutants, or contaminants throughout the United States and its territories. The NPL is intended primarily to guide the EPA in determining which sites warrant further investigation. The NPL is updated periodically, as mandated by CERCLA.

There were no Federal NPL sites found within a one-mile radius of the target property.

Lists of Federal Delisted NPL sites

The EPA may delete a final NPL site if it determines that no further response is required to protect human health or the environment. Under Section 300.425(e) of the NCP (55 FR 8845, March 8, 1990), a site may be deleted when no further response is appropriate if EPA determines that one of the following criteria has been met: 1) EPA, in conjunction with the state, has determined that responsible parties have implemented all appropriate response action required, 2) EPA, in consultation with the state, has determined that all appropriate Superfund-financed responses under CERCLA have been implemented and that no further response by responsible parties is appropriate, 3) A remedial investigation/feasibility study (RI/FS) has shown that the release poses no significant threat to public health or the environment and, therefore, remedial measures are not appropriate.

There were no Federal Delisted NPL sites found within a half-mile radius of the target property.

Lists of Federal sites subject to CERCLA removals and CERCLA orders

CERCLA identifies the classes of parties liable under CERCLA for the cost of responding to releases of hazardous substances. In addition, CERCLA contains provisions specifying when Federal installations must report releases of hazardous substances and the cleanup procedures they must follow. Executive Order No. 12580, Superfund Implementation, delegates response authorities to EPA and the Coast Guard. Generally, the head of the Federal agency has the delegated authority to address releases at the Federal facilities in its jurisdiction.

There were no Federal sites subject to CERCLA removals and/or orders found within a half-mile radius of the target property.

Lists of Federal CERCLA sites with NFRAP

No Further Remedial Action Planned (NFRAP) is a decision made as part of the Superfund remedial site evaluation process to denote that further remedial assessment activities are not required and that the facility/site does not pose a threat to public health or the environment sufficient to qualify for placement on the National Priorities List (NPL) based on currently available information. These facilities/sites may be re-evaluated if EPA receives new information or learns that site conditions have changed. A NFRAP decision does not mean the facility/site is free of contamination and does not preclude the facility/site from being addressed under another federal, state or tribal cleanup program.

There were no Federal CERCLA sites with No Further Remedial Action Planned (NFRAP) decisions found within a half-mile radius of the target property.

Lists of Federal RCRA facilities undergoing Corrective Action

Corrective action is a requirement under the Resource Conservation and Recovery Act (RCRA) that facilities that treat, store or dispose of hazardous wastes investigate and cleanup hazardous releases into soil, ground water, surface water and air. Corrective action is principally implemented through RCRA permits and orders. RCRA permits issued to TSDFs must include provisions for corrective action as well as financial assurance to cover the costs of implementing those cleanup measures. In addition to the EPA, 44 states and territories are authorized to run the Corrective Action program.

There were no Federal RCRA facilities undergoing corrective action(s) found within a half-mile radius of the target property.

Lists of Federal RCRA TSD facilities

The final link in RCRA's cradle-to-grave concept is the treatment, storage, and disposal facility (TSDF) that follows the generator and transporter in the chain of waste management activities. The regulations pertaining to TSDFs are more stringent than those that apply to generators or transporters. They include general facility standards as well as unit-specific design and operating criteria.

There were no Federal RCRA treatment, storage and disposal facilities (TSDFs) found within a half-mile radius of target property.

Lists of Federal RCRA generators

A generator is any person who produces a hazardous waste as listed or characterized in part 261 of title 40 of the Code of Federal Regulations (CFR). Recognizing that generators also produce waste in different quantities, EPA established three categories of generators in the regulations: very small quantity generators, small quantity generators, and large quantity generators. EPA regulates hazardous waste under the Resource Conservation and Recovery Act (RCRA) to ensure that these wastes are managed in ways that protect human health and the environment. Generators of hazardous waste are regulated based on the amount of hazardous waste they generate in a calendar month, not the size of their business or facility.

There were no Federal RCRA generators found at the target property and/or adjoining properties.

Federal institutional control/engineering control registries

Institutional Controls (IC) are defined as non-engineered and/or legal controls that minimize the potential human exposure to contamination by limiting land or resource use. Whereas, Engineering Controls (EC) consist of engineering measures (e.g, caps, treatment systems, etc.) designed to minimize the potential for human exposure to contamination by either limiting direct contact with contaminated areas or controlling migration of contaminants through environmental media.

There were no Federal institutional or engineering controls found at the target property.

Federal ERNS list

The Emergency Response Notification System (ERNS) is a database used to store information on notification of oil discharges and hazardous substances releases. The ERNS program is a cooperative data sharing effort encompassing the National Response Center (NRC), operated by the US Coast Guard, EPA HQ and EPA regional offices. ERNS data is used to analyze release notifications, track EPA responses and compliance to environmental laws, support emergency planning efforts, and assist decision-makers in developing spill prevention programs.

There were no Federally recorded releases of oil and/or hazardous substances at the target property.

Lists of state and tribal Superfund equivalent sites

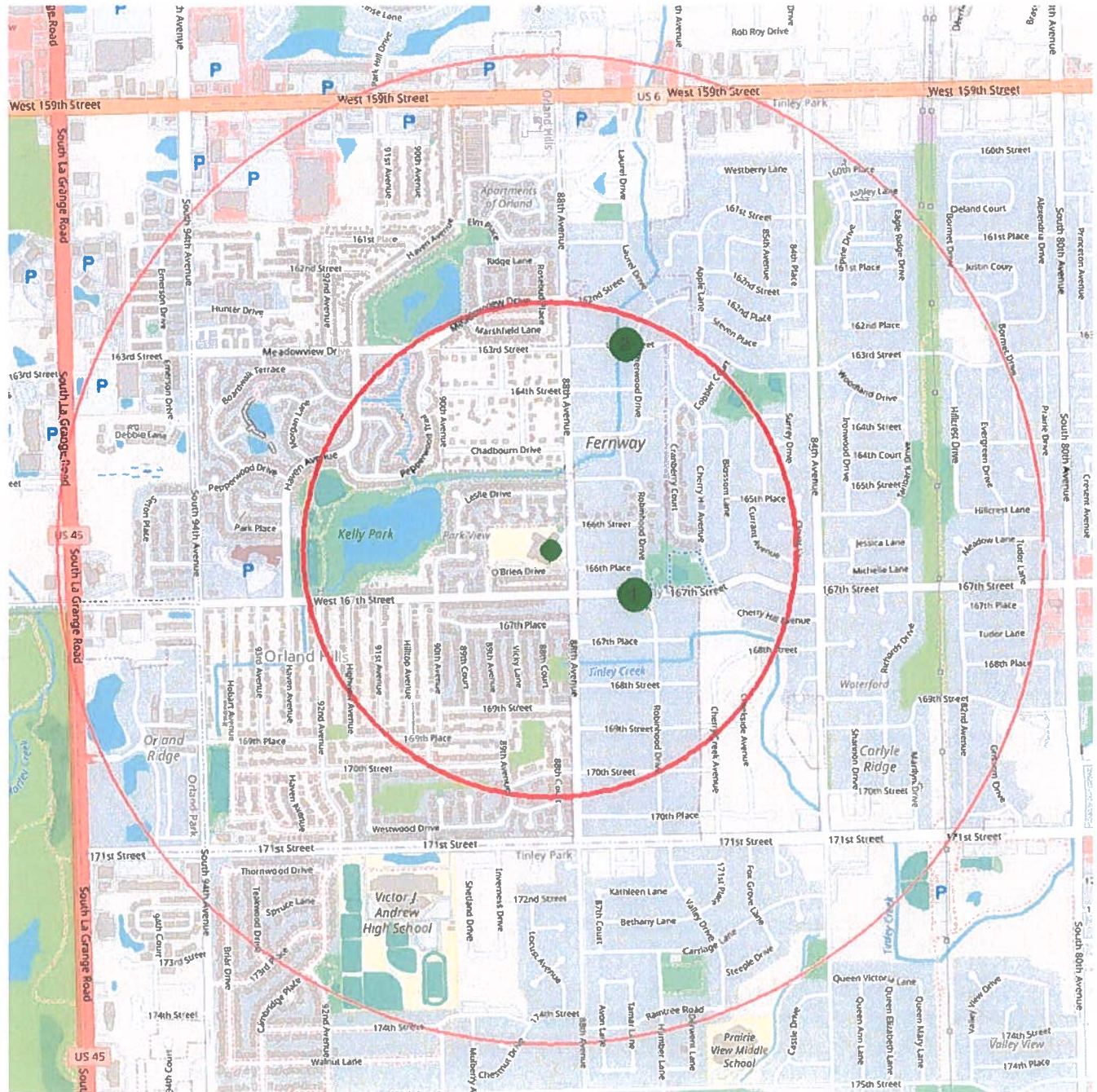
In order to maintain close coordination with the states and tribes in the NPL listing decision process, the EPA's policy is to determine the position of states and tribes on sites that EPA is considering for listing. Consistent with this policy, since 1996, it has been the EPA's general practice to seek the state or tribe's position on sites under consideration for NPL listing by submitting a written request to the governor/state environmental agency or tribe. Various states may have their own program for identifying, investigating and cleaning up sites where consequential amounts of hazardous waste may have been disposed that work in conjunction with the EPA's Superfund remedial program.

There were no State and/or tribal Superfund equivalent sites found within a one-mile radius of target property.

Lists of state and tribal hazardous waste facilities

IEPA - RCRA HAZARDOUS WASTE FACILITIES

The Resource Conservation and Recovery Act's (RCRA) hazardous waste permitting program ensures the safe management of hazardous wastes. Under this program, EPA establishes requirements regarding the treatment, storage and disposal of hazardous wastes. The permitting program is important to the cradle-to-grave management system for hazardous wastes, which prevents dangerous releases and avoids costly Superfund cleanups. Permits are issued by authorized state or EPA regional offices. State and EPA cooperate to implement RCRA. Hazardous waste management facilities receive hazardous wastes for treatment, storage, or disposal. These facilities are often referred to as treatment, storage and disposal facilities, or TSDFs. This data set was searched to return all records within a half-mile of the target property.



center 41.588442 -87.833583

0.5 mile

1.0 mile

IEPA - RCRA HAZARDOUS WASTE FACILITIES



RCRA Name **CHICAGO INTERNATIONAL TELEPORT**
Source ID **IL0000026161**
Address **1300 FT N 167TH ST**
City **ORLAND PARK**
Registry ID **110005794818**
Significant Non-Compliance **No**
distance from center (miles) 0.1958
data source last updated 2022-02-18 from IEPA-HWF



RCRA Name **TNT AUTO WORKS**
Source ID **ILD984904821**
Address **8710 W 163RD ST**
City **ORLAND PARK**
Registry ID **110005916651**
Significant Non-Compliance **No**
distance from center (miles) 0.4425
data source last updated 2022-02-18 from IEPA-HWF

Lists of state and tribal landfills and solid waste disposal facilities

Title 40 of the CFR parts 239 through 259 contain the regulations for non-hazardous solid waste programs set up by the states. EPA has requirements for state solid waste permit programs, guidelines for the processing of solid waste, guidelines for storage and collection of commercial, residential and institutional solid waste, and the criteria for municipal solid waste landfills. State solid waste programs may be more stringent than the federal code requires.

There were no State and/or tribal landfills or solid waste disposal facilities found within a half-mile radius of the target property.

Lists of state and tribal leaking storage tanks

A typical leaking underground storage tank (LUST) scenario involves the release of a fuel product from an underground storage tank (UST) that can contaminate surrounding soil, groundwater, or surface waters, or affect indoor air spaces. Once a leak is confirmed, immediate response actions must be taken to minimize or eliminate the source of the release and to reduce potential harm to human health, safety, and the environment. Each state has unique requirements for initiating responses to a release, and it is up to the UST owner or operator to conduct actions in compliance with his/her local rules.

There were no State and/or tribal leaking storage tanks found within a half-mile radius of the target property.

Lists of state and tribal registered storage tanks

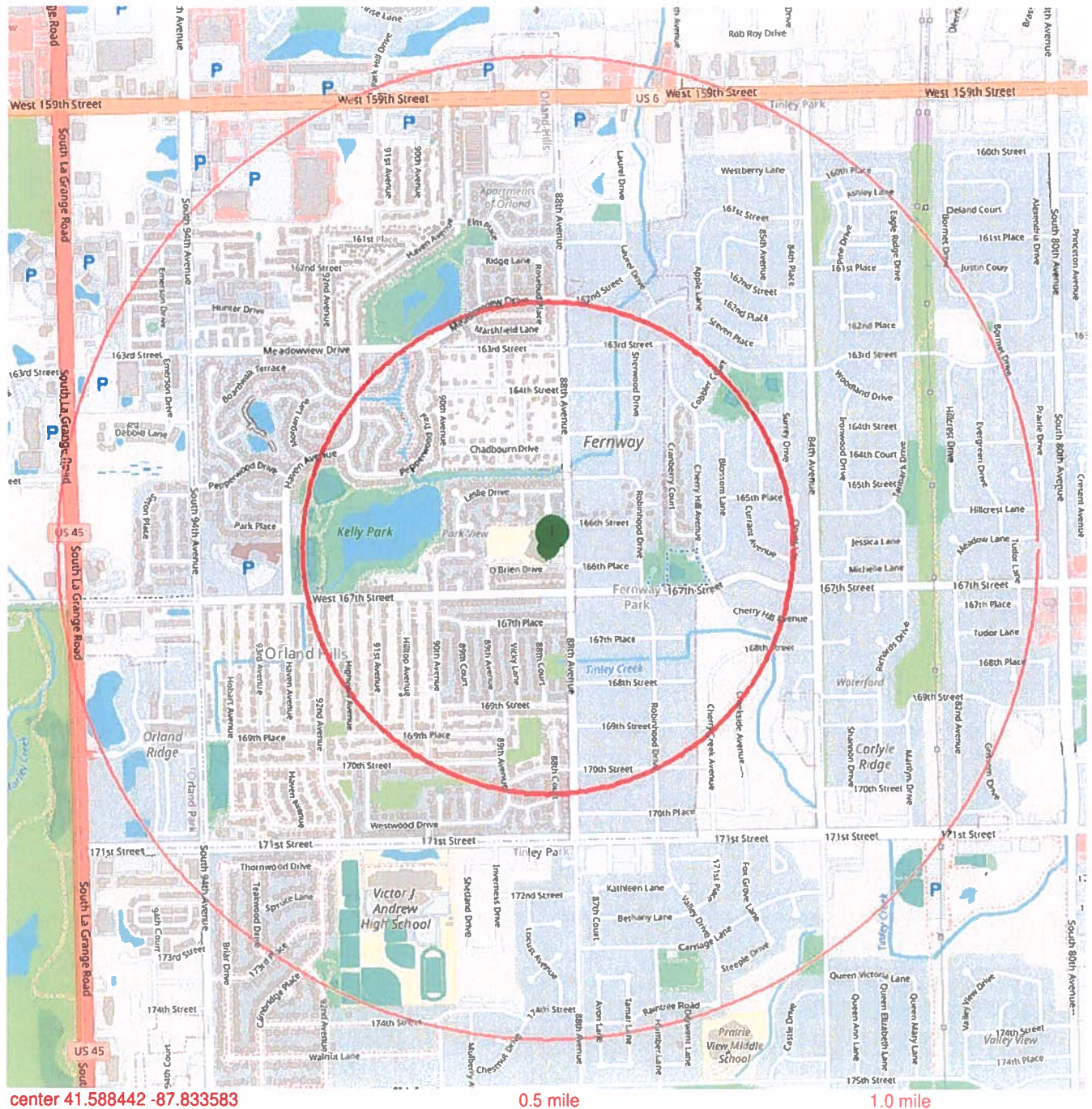
EPA initially issued UST regulations in 1988. In 2015, EPA modified the UST regulation, which was effective October 13, 2015 in Indian Country and states without State Program Approval. EPA recognizes that, because of the size and diversity of the regulated community, state and local governments are in the best position to oversee USTs: 1) State and local authorities are closer to the situation in their domain and are in the best position to set priorities, 2) Subtitle I of the Solid Waste Disposal Act allows state UST programs approved by EPA to operate in lieu of the federal program, 3) the state program approval (SPA) regulations set criteria for states to obtain the authority to operate in lieu of the federal program. State programs must be at least as stringent as EPA's. A complete version of the law that governs USTs can be found in U.S. Code, Title 42, Chapter 82, Subchapter IX.

There were no State and/or tribal registered storage tanks found at subject and adjoining properties.

State and tribal institutional control/engineering control registries

IEPA - NO FURTHER REMEDIATION NOTICE

A No-Further Remediation (NFR) letter, issued by the Illinois Environmental Protection Agency's (IEPA) Bureau of Land (BOL), acknowledges that a site owner or operator has satisfied the respective BOL laws and regulations. A site qualifies to receive an NFR letter once the owner or operator meets all program requirements and the applicable TACO remediation objectives. IEPA maintains a dataset including all Remedial Project management Section Sites with No Further Remediation notices. This dataset has been searched to return all results regarding the target property and/or adjacent properties.



IEPA - NO FURTHER REMEDIATION NOTICE

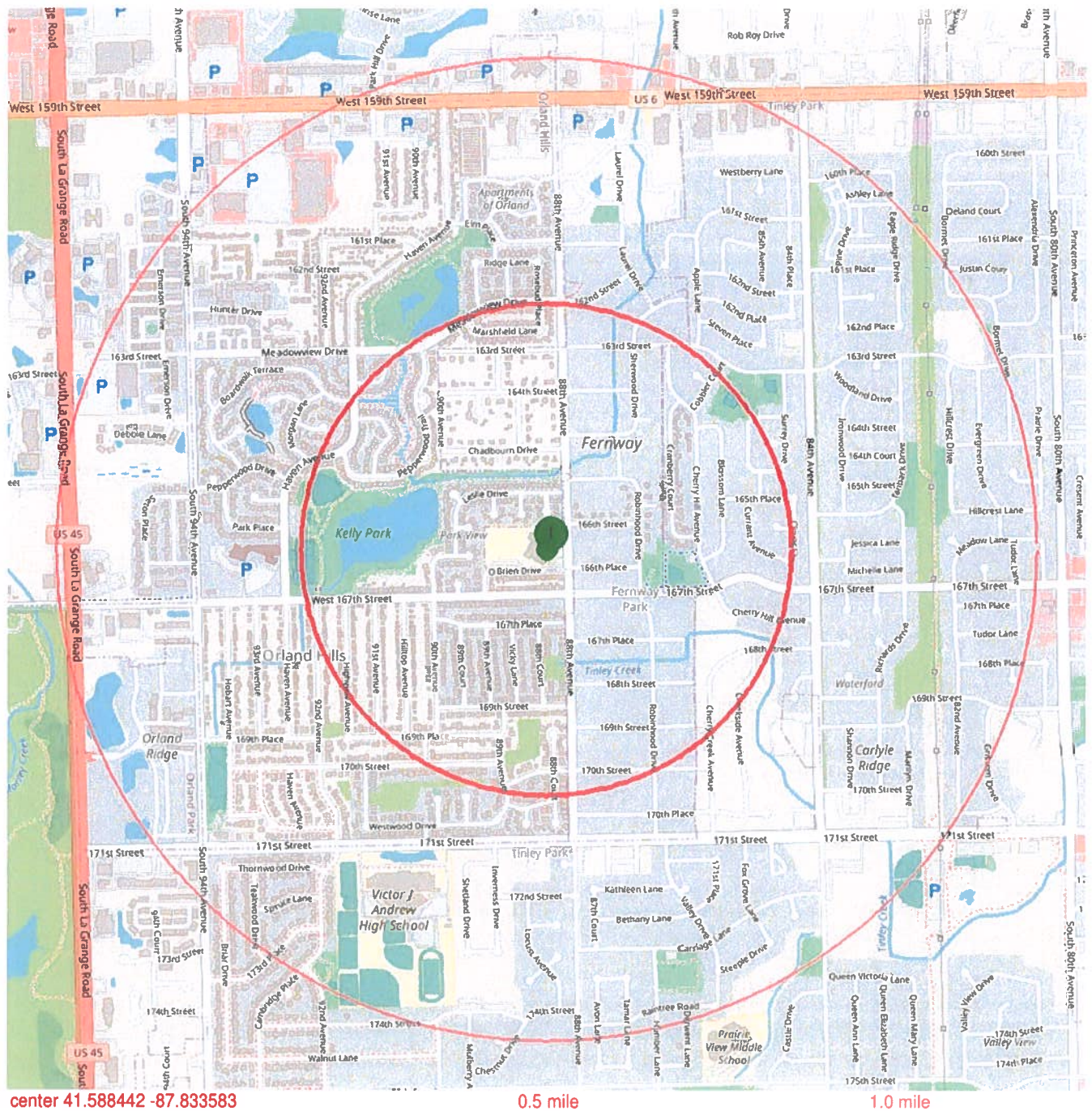


IEPA ID	0312315131
Site Name	East Willow Cleaners
Address	1650 Willow Road
City	Northfield
NFR Letter Date	2007-06-04
distance from center (miles)	0.0337
data source	last updated 2022-02-18 from IEPA-NFR


Lists of state and tribal voluntary cleanup sites

IEPA - SITE REMEDIATION PROGRAM

The Voluntary Site Remediation Program (VSRP) provides Remediation Applicants (i.e., any persons seeking to perform investigavtive or remedial activities) the opportunity to receive Illinois Environmental Protection Agency (IEPA) review, technical assistance and no further remediation determinations from the IEPA. IEPA is authorized to issue No Further Remediation (NFR) letters to the Remedial Applicants who have successfully demonstrated, through proper investigation and, when warranted, remedial action, that environmental conditions at their remediation site do not present a significant risk to human health or the environment. This dataset has been searched to return all VSRP sites within a half-mile of the target property.



IEPA - SITE REMEDIATION PROGRAM



IEPA ID	312315131
USEPA ID	ILR000161752
Site Name	Fernway Park School
Address	16600 South 88th Avenue
City	Orland Park
Consultant Company	Envirogen
Active Site	No
distance from center (miles)	0.0333
data source	last updated 2022-02-22 from IEPA-VSR

Lists of state and tribal brownfields sites

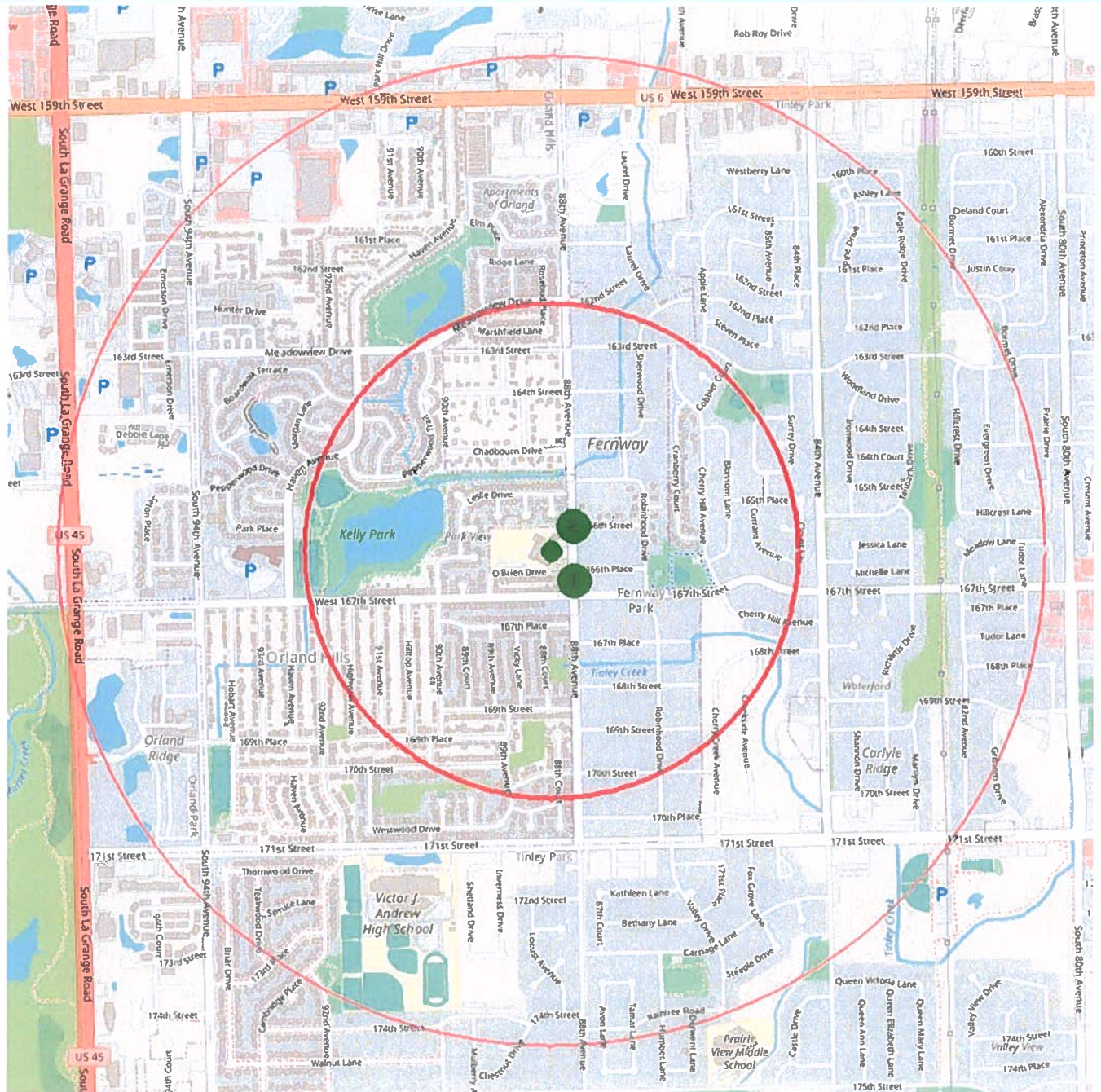
Since its inception in 1995, EPA's Brownfields and Land Revitalization Program has grown into a proven, results-oriented program that has changed the way communities address and manage contaminated property. The program is designed to empower states, tribes, communities, and other stakeholders to work together to prevent, assess, safely clean up, and sustainably reuse brownfields. Beginning in the mid-1990s, EPA provided small amounts of seed money to local governments that launched hundreds of two-year Brownfields pilot projects and developed guidance and tools to help states, communities and other stakeholders in the cleanup and redevelopment of brownfields sites.

There were no State and/or tribal brownfields sites found within a half-mile radius of the target property.

State and/or tribal lists of permitted facilities

ILLINOIS - AGENCY COMPLIANCE AND ENFORCEMENT SYSTEMS

The ACES computer system supports the compliance and enforcement activities that exist primarily within the Illinois Bureau of Air, Water, and Land, the Division of Legal Counsel, and the Office of Chemical Safety. The intent of the system is to track compliance and enforcement processes and to share the information throughout the agency.




center 41.588442 -87.833583

0.5 mile

1.0 mile



Registry ID	110055959253
Name	FERNWAY PARK ELEM
Address	16660 S 88TH
City	ORLAND PARK
Site Type	STATIONARY
Program Acronyms	ACES:170001993706
Interest Type	STATE MASTER
Date Created	23-SEP-13
FRS Facility Detail Report URL	Link
distance from center (miles)	0.0761
data source	last updated from FACILITY REGISTRY SERVICE



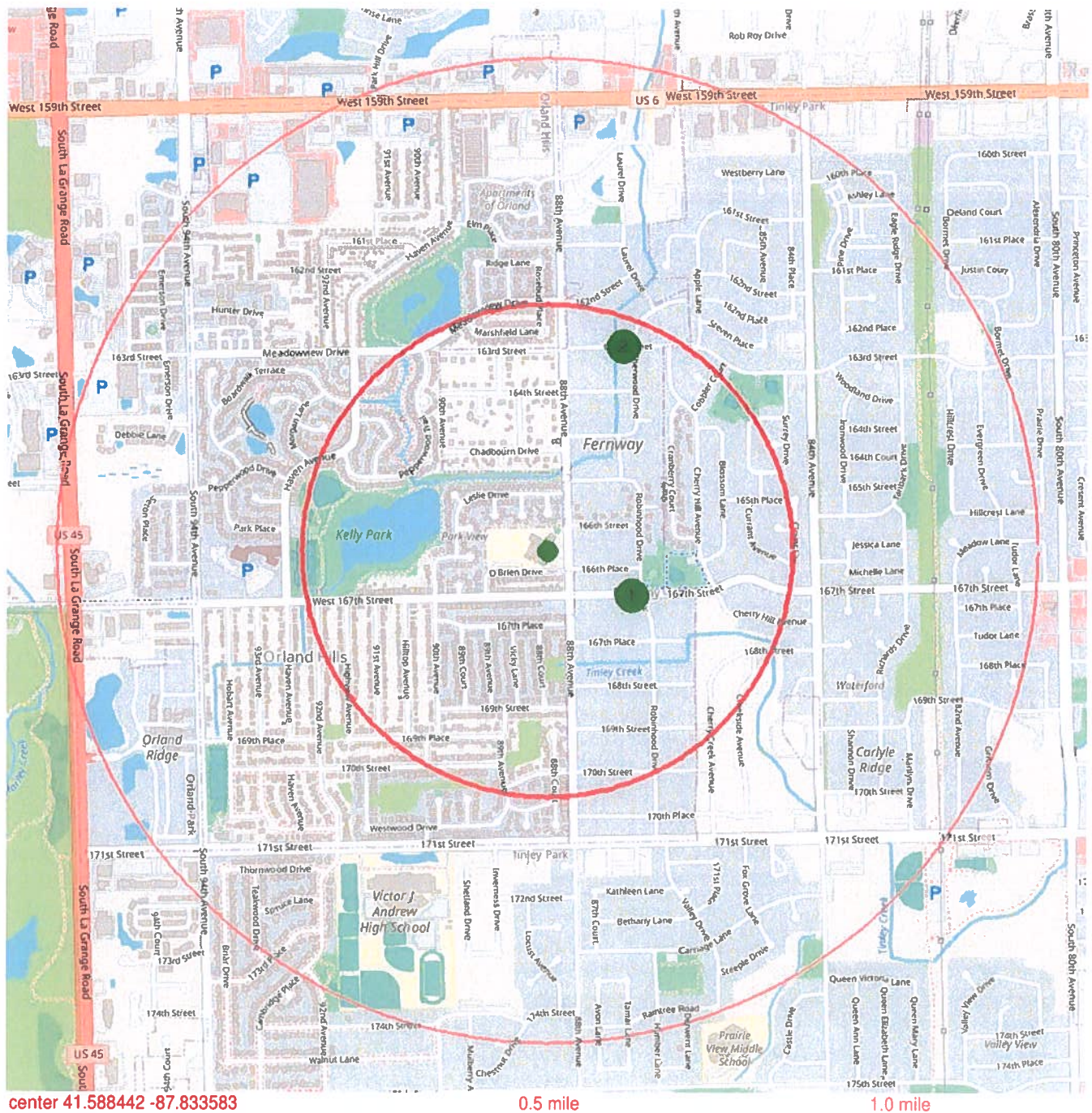
Registry ID	110036970310
Name	FERNWAY PARK ELEM SCHOOL
Address	16600 88TH AVE
City	ORLAND PARK
Site Type	STATIONARY
Program Acronyms	ACES:170000471816, RCRAINFO:ILR000161752
Interest Type	STATE MASTER, UNSPECIFIED UNIVERSE
Date Created	22-JUN-08
Date Updated	28-MAR-14
FRS Facility Detail Report URL	Link
distance from center (miles)	0.0667
data source	last updated from FACILITY REGISTRY SERVICE

Resource Conservation and Recovery Act Information (RCRAInfo)

RESOURCE CONSERVATION AND RECOVERY ACT INFORMATION SYSTEM

RCRAInfo is EPA's comprehensive information system that supports the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984 through the tracking of events and activities related to facilities that generate, transport, and treat, store, or dispose of hazardous waste.


Please note that RCRAInfo contains all hazardous waste handlers in addition to TSDFs, generators, and facilities undergoing RCRA corrective action. One may encounter duplicate records from the TSDF, generators, and/or the RCRA corrective action sections. This source was searched for all records within a half-mile of the target property.



RESOURCE CONSERVATION AND RECOVERY ACT INFORMATION SYSTEM



Registry ID	110005794818
Name	CHICAGO INTERNATIONAL TELEPORT
Address	1300 FT N 167TH ST
City	ORLAND PARK
Site Type	STATIONARY
Program Acronyms	RCRAINFO:IL0000026161
Interest Type	VSQG
Date Created	01-MAR-00
Date Updated	26-JAN-12
FRS Facility Detail Report URL	Link
distance from center (miles)	0.1958
data source	last updated from FACILITY REGISTRY SERVICE



Registry ID	110005916651
Name	TNT AUTO WORKS
Address	8710 W 163RD ST
City	ORLAND PARK
Site Type	STATIONARY
Program Acronyms	ACES:170000298862, RCRAINFO:ILD984904821
Interest Type	STATE MASTER, VSQG
Date Created	01-MAR-00
Date Updated	26-JAN-12
FRS Facility Detail Report URL	Link
distance from center (miles)	0.4425
data source	last updated from FACILITY REGISTRY SERVICE

U.S. EPA Underground Storage Tanks (UST)

No records found

This report contains certain information obtained from a variety of public and other sources reasonably available to Nationwide Environmental Title Research, LLC (NETR). It cannot be concluded from this Report that coverage information for the target and surrounding properties does not exist from other sources. **NO WARRANTY EXPRESSED OR IMPLIED, IS MADE WHATSOEVER IN CONNECTION WITH THIS REPORT. NATIONWIDE ENVIRONMENTAL TITLE RESEARCH, LLC SPECIFICALLY DISCLAIMS THE MAKING OF ANY SUCH WARRANTIES, INCLUDING WITHOUT LIMITATION, MERCHANTABILITY OR FITNESS FOR A PARTICULAR USE OR PURPOSE. ALL RISK IS ASSUMED BY THE USER. IN NO EVENT SHALL NATIONWIDE ENVIRONMENTAL TITLE RESEARCH, LLC, BE LIABLE TO ANYONE, WHETHER ARISING OUT OF ERRORS OR OMISSIONS, NEGLIGENCE, ACCIDENT OR ANY OTHER CAUSE, FOR ANY LOSS OF DAMAGE, INCLUDING, WITHOUT LIMITATION, SPECIAL, INCIDENTAL, CONSEQUENTIAL, OR EXEMPLARY DAMAGES. ANY LIABILITY ON THE PART OF NATIONWIDE ENVIRONMENTAL TITLE RESEARCH, LLC, IS STRICTLY LIMITED TO A REFUND OF THE AMOUNT PAID FOR THIS REPORT.** Purchaser accepts this report "AS-IS". Any analyses, estimates, ratings, environmental risk levels or risk codes provided in this report are provided for illustrative purposes only, and are not intended to provide, nor should they be interpreted as providing any facts regarding, or prediction or forecast of, any environmental risk for any property. Only a Phase I Environmental Site Assessment performed by an environmental professional can provide information regarding the environmental risk for any property. Additionally, the information provided in this Report is not to be construed as legal advice.

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APPENDIX 6

GENERAL REMARKS

This report has been prepared in order to aid in the evaluation of this property and to assist the architect and/or engineer in the design of this project. The scope is limited to the specific project and location described herein, and our description of the project represents our understanding of the significant aspects relevant to soil and foundation characteristics. In the event that any changes in the design or location of the building(s) as outlined in this report are planned, we should be informed so the changes can be reviewed and the conclusions of this report modified as necessary in writing by the geotechnical engineer. As a check, we recommend that we be authorized to review the project plans and specifications to confirm that the recommendations contained in this report have been interpreted in accordance with our intent. Without this review, we will not be responsible for misinterpretation of our data, our analysis, and/or our recommendations, nor how these are incorporated into the final design.

It is recommended that all construction operations dealing with earthwork and foundations be reviewed by an experienced geotechnical engineer to provide information on which to base a decision whether the design requirements are fulfilled in the actual construction. If you wish, we would welcome the opportunity to provide field construction services for you during construction.

The analysis and recommendations submitted in this report are based upon the data obtained from the soil borings performed at the locations indicated on the location diagram and from any other information discussed in this report. This report does not reflect any variations which may occur between these borings. In the performance of subsurface explorations, specific information is obtained at specific locations at specific times. However, it is a well-known fact that variations in soil and rock conditions exist on most sites between boring locations and also such situations as groundwater levels vary from time to time. The nature and extent of variations may not become evident until the course of construction. If variations then appear evident, it will be necessary for re-evaluation of the recommendations of this report after performing on-site observations during the construction period and noting the characteristics of any variations.

SECTION 00300

BID FORM

THE PROJECT AND THE PARTIES

1.1 NAME OF BIDDER: _____

1.2 TO: THE BOARD OF EDUCATION
KIRBY SCHOOL DISTRICT 140
16931 S. GRISSOM DRIVE
TINLEY PARK, ILLINOIS 60477

A. We as contractor having familiarized ourselves with local conditions affecting the work and with the proposed Contract Documents on file at the office of the Owner, hereby propose to perform everything required to be performed and to provide all of the labor, materials, necessary equipment and all utilities and transportation and services necessary to perform and complete in a workmanlike manner all work required to complete the proposed work indicated in the bidding documents for the construction of the New Fernway Park Elementary School, all in accordance with the Drawings and Specifications prepared by the office of TRIA Architecture, Inc. including Addenda No. _____, _____, _____ and _____ issued thereto for the sum of:

1. Base Bid for all Work:

(\$ _____ , _____ , _____ . _____)

2. The base bid consists of all Work specified and required by the proposed Contract Documents.

B. Alternate Bids: The undersigned hereby states the net amount of increase or decrease to the Lump Sum Base Bid for the following Alternates as described in Section 01230.

ALTERNATE NO. 1: **Early Childhood Wing**

ADD to the Lump Sum \$ _____.

ALTERNATE NO. 2: **Learning Stair**

ADD to the Lump Sum \$ _____.

ALTERNATE NO. 3: **Early Childhood Playground**

ADD to the Lump Sum \$ _____.

ALTERNATE NO. 4: **K-5 Playground**

ADD to the Lump Sum \$ _____.

ALTERNATE NO. 6: **Removal of (2) Masonry Planters**

DEDUCT to the Lump Sum \$ _____.

ALTERNATE NO. 7: **Vinyl Wall Covering**

DEDUCT to the Lump Sum \$ _____.

ALTERNATE NO. 8: **Tackboard and Markerboard Wall Coverings**

DEDUCT to the Lump Sum \$ _____.

ALTERNATE NO. 9: **Roof Stairs**

DEDUCT to the Lump Sum \$ _____.

SECTION 00300

BID FORM

C. Unit Prices: Should additional work of the following categories be required, adjustments will be made to the Contract Sum at the following Unit Prices, which shall include all expenses, including overhead and profit; should less work be required, the Unit Prices will be 15% less the price quoted for additional work.

- 1. Item: Structural Fill – CA-6 \$ _____ Per Cubic Yard
- 2. Item: Graded Granular Fill – CA-6 \$ _____ Per Cubic Yard
- 3. Item: Open Granular Fill – CA-7 \$ _____ Per Cubic Yard
- 4. Item: Crushed Stone Aggregate Base Course – CA – 6
 \$ _____ Per Cubic Yard
- 5. Item: Concrete Fill – Lean Concrete \$ _____ Per Cubic Yard
- 6. Item: Remove Unsuitable Material \$ _____ Per Cubic Yard
- 7. Item: Asphalt Paving – Standard Duty Section
 \$ _____ Per Square Yard
- 8. Soil Haul Off \$ _____ Per Cubic Yard

D. Accompanying this proposal is a Bid Security payable to the Board of Education, Kirby School District 140, which is agreed will be forfeited to the aforementioned as liquidated damages if the undersigned fails to execute the standard form of Owner/Contractor Agreement (AIA Document A101, 2017 Edition, as modified), which is included herein, and furnish evidence of their ability to become bonded and to provide insurance coverage as specified, within five days after notification of the Intent to Award Contract to the undersigned.

E. In signing and submitting this Bid, the undersigned certifies that all materials and construction to be provided are as indicated in the proposed Contract Documents.

F. Time of Completion: If awarded the Contract, the bidder agrees to complete all Construction Work and achieve Substantial Completion by Phase 1 – July 15, 2025, 5:00 p.m and Phase 2 – October 30, 2025, 5:00 p.m.. NOTE: Substantial Completion for this project refers to all work being a minimum of 99% complete. Final Completion for this project refers to all scheduled work, punch-list and closeout items being 100% complete.

G. The space below of the desired Substantial Completion Date has been left blank for insertion of Contractor's own desired Substantial Completion Date, if he feels that the desired date as stated in the specifications cannot be met. Insertion of a date by the bidder does not change the specified Substantial Completion Date unless the Owner chooses to accept the bidder's date when awarding the contract.

1. Specified Substantial Completion Date: Phase 1 – July 15, 2025, 5:00 p.m.
Contractor's Desired Substantial Completion Date: _____.

2. Specified Substantial Completion Date: Phase 2 – October 30, 2025, 5:00 p.m.
Contractor's Desired Substantial Completion Date: _____.

H. Base Bid Breakdown: For the purpose of logical comparison of orders of magnitude in the bids, the Owner requires a global breakdown of the components of the base bid. Contractors are required to provide this breakdown. Failure to do so will subject the bid to rejection. The sum of the following items must equal the Lump Sum Base Bid.

SECTION 00300

BID FORM

BREAKDOWN:

Division 01:	General Requirements – Allowances:	\$
Division 01:	General Requirements – O&P:	\$
Division 01:	General Requirements – Remaining Items:	\$
Division 02:	Sitework:	\$
	Subcontractor (Legal Name, Address):	
Division 03:	Concrete:	\$
	Subcontractor (Legal Name, Address):	
Division 04:	Masonry:	\$
	Subcontractor (Legal Name, Address):	
Division 05:	Metals:	\$
	Subcontractor (Legal Name, Address):	
Division 06:	Wood and Plastic:	\$
	Subcontractor (Legal Name, Address):	
Division 07:	Thermal and Moisture Protection:	\$
	Subcontractor (Legal Name, Address):	
Division 08:	Doors and Windows:	\$
	Subcontractor (Legal Name, Address):	
Division 09:	Finishes:	\$
	Subcontractor (Legal Name, Address):	
Division 10:	Specialties:	\$
	Subcontractor (Legal Name, Address):	

SECTION 00300

BID FORM

Division 11: Equipment: \$ _____
Subcontractor (Legal Name, Address): _____

Division 15: Mechanical - HVAC: \$ _____
Subcontractor (Legal Name, Address): _____

Division 15: Mechanical - Plumbing: \$ _____
Subcontractor (Legal Name, Address): _____

Division 16: Electrical: \$ _____
Subcontractor (Legal Name, Address): _____

Division 16: Electrical – Fire Alarm: \$ _____
Subcontractor (Legal Name, Address): _____

Division 16: Electrical – Low Voltage: \$ _____
Subcontractor (Legal Name, Address): _____

Division 17: Building Automation System: \$ _____
Subcontractor (Legal Name, Address): _____

Miscellaneous Any items not identified above: \$ _____
Subcontractor (Legal Name, Address): _____

TOTAL (Should equal base bid): \$ _____

SECTION 00300

BID FORM

FIRM NAME: _____

OFFICIAL ADDRESS: _____

Telephone Number: _____ Fax Number: _____

Email Address: _____

By: _____ Date: _____
(Signature)

(Printed/Typed Name and Title)

Where the Bidder is a corporation, add Attest

Secretary (signature) Date (SEAL)

CERTIFIED OR CASHIERS CHECK, BID BOND, OR BANK DRAFT ENCLOSED IN THE FOLLOWING AMOUNT: \$_____.

END OF BID FORM

SECTION 00410

BID BOND

1.1 BID BOND INFORMATION

- A. KNOW ALL MEN BY THESE PRESENTS, THAT WE _____ as Principal, hereinafter called the Principal, and _____ a corporation duly organized under the laws of the State of Illinois as Surety, are held and firmly bound unto _____ as Oblige, hereinafter called Oblige, in the sum of _____ Dollars (\$ _____), for the payment of which sum well and truly to be made, the said Principal and the said Surety, bind ourselves, our heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents.
- B. WHEREAS, the Principal has submitted a bid for: New Fernway Park Elementary School.
- C. NOW, THEREFORE, if the Oblige shall accept the bid of the Principal and the Principal shall enter into a Contract with the Oblige in accordance with the terms of such bid, and give such bond or bonds as may be specified in the bidding or Contract Documents with good and sufficient surety for the faithful performance of such Contract and for the prompt payment of labor and material furnished in the prosecution thereof; or in the event of the failure of the Principal to enter such Contract and give such bond or bonds, if the Principal shall pay to the Oblige the difference not to exceed the penalty hereof between the amount specified in said bid and such larger amount for which the Oblige may in good faith contract with another party to perform the Work covered by said bid, then this obligation shall be null and void, otherwise to remain in full force and effect.
- D. The bid bond must comply with the rating level required for the performance and payment bond as stated in section 11.4 of AIA document A201.

Signed and sealed this _____ day of _____.

(Principal) (SEAL)

(Witness) (Title) _____

(Surety) (SEAL)

(Witness) (Title) _____

SECTION 00440

SUBSTITUTION SHEET

1.1 SUBSTITUTION INFORMATION

- A. All bids shall be based upon the provisions of the proposed Contract Documents.
- B. Bidders desiring to make substitutions for "proprietary brands" specified shall list such proposed substitutions below, together with the amount to be added or deducted from the amounts of their base bids.
- C. The Owner reserves the right to reject all such substitutions, and such substitutions will not be used to determine the low bid.
- D. Complete descriptions and technical data shall accompany all proposed substitutions.
- E. NOTE: Manufacturer's names and material approved by the Architect during the bidding time, but not shown in Addenda, must be listed below if said material is to be considered.

F. BRAND/MAKE SPECIFIED	PROPOSED	ADD	DEDUCT
1.	_____		
2.	_____		
3.	_____		
4.	_____		
5.	_____		
6.	_____		
7.	_____		
8.	_____		
9.	_____		
10.	_____		
11.	_____		

NAME OF BIDDER: _____

DATE: _____.

END OF SECTION

SECTION 00482

STATEMENT OF ETHICS CERTIFICATION

By submission of this bid or proposal, the bidder certifies that:

- a. This bid or proposal has been independently prepared, without collusion with any other bidder or competitor.
- b. This bid or proposal has not been knowingly disclosed and will not be knowingly disclosed, prior to the opening of bids or proposals for this project, to any other bidder, competitor or potential competitor.
- c. No attempt has been or will be made to induce any other person, partnership or corporation to submit or not to submit a bid or proposal.
- d. Bidder has not been convicted of price fixing nor pleaded "no contest" to such charges within the last five (5) years.
- e. Bidder is not a subsidiary of a company that has been convicted of price fixing nor pleaded "no contest" to such charges within the last five (5) years.

Date

Authorized Signature

Title

SECTION 00485

**CERTIFICATE OF COMPLIANCE WITH
ILLINOIS DRUG-FREE WORKPLACE ACT**

_____ (CONTRACTOR), having 25 or more employees, does hereby certify pursuant to Section 3 of the Illinois Drug-Free Workplace Act (30 ILCS 580/3) that (he, she, it) shall provide a drug-free workplace for all employees engaged in the performance of work under the contract by complying with the requirements of the Illinois Drug-Free Workplace Act and, further certifies, that (he, she, it) is not ineligible for award of this contract by reason of debarment for a violation of the Illinois Drug-Free Workplace Act.

By: _____
Authorized Agent

Date: _____

SUBSCRIBED and SWORN TO before me

This _____ day of _____, _____

Notary Public

END OF SECTION

SECTION 00487

**CERTIFICATE REGARDING
SEXUAL HARASSMENT POLICY**

_____, (CONTRACTOR), does hereby certify pursuant to Section 2-105 of the Illinois Human Rights Act (775 ILCS 5/2-105) that (he, she, it) has a written sexual harassment policy that includes, at a minimum, the following information:

1. The illegality of sexual harassment;
2. The definition of sexual harassment under State law;
3. A description of sexual harassment, utilizing examples;
4. An internal complaint process including penalties;
5. The legal recourse, investigative and complaint process available through the Department of Human Rights and Human Rights Commission;
6. Directions on how to contact the Department of Human Rights and Human Rights Commission; and
7. Protection against retaliation.

By: _____
Authorized Agent

Date: _____

SUBSCRIBED and SWORN TO before me

This _____ day of _____, _____

Notary Public

END OF SECTION

SECTION 00495

CERTIFICATE OF BIDDER ELIGIBILITY

720 ILCS 5/33-11 requires that all contractors bidding for public agencies in the State of Illinois certify that they are not barred from bidding on public contracts for rigging or bid rotation.

The following certification must be signed and submitted with the bidder's bid proposal. FAILURE TO DO SO MAY RESULT IN DISQUALIFICATION OF THE BIDDER.

_____, as part of its bid for the **New Fernway Park Elementary School** for Kirby School District 140, certifies that said contractor is not barred from bidding on the aforementioned contract as a result of a violation of either 720 ILCS 5/33E-3, OR 720 ILCS 5/33 E-4.

Firm name: _____

By: _____
Authorized Agent of Contractor

Title: _____

SUBSCRIBED and SWORN TO before me

This _____ day of _____, _____

Notary Public

END OF SECTION

SECTION 00496

CERTIFICATION OF ELIGIBILITY
TO ENTER INTO PUBLIC CONTRACTS

IMPORTANT: This Certification must be executed.

I, _____, being first duly sworn
certify and say that I am

(insert "sole owner," "partner," "president," or other proper title)

of _____, the Prime Contractor
submitting this proposal and that the Prime Contractor is not barred from contracting with any unit
of state or local government as a result of a violation of either Section 33E-3 or 33E-4 of the Illinois
Criminal Code, or of any similar offense of "bid-rigging" or "bid-rotating" of any State or of the
United States.

Signature of person making certification

SUBSCRIBED AND SWORN to before me

this _____ day of _____, _____.

Notary Public

SECTION 00497

STATEMENT OF COMPLIANCE CERTIFICATION

By submission of this bid or proposal, the bidder certifies that:

- a. Contractor will submit their Federal Employer Tax Identification Number or Social Security Number (for individual) to the District if awarded the contract.
- b. Contractor has participated/ is participating in apprenticeship and training programs approved by and registered with the United States Department of Labor's Bureau of Apprenticeship and Training.
- c. Contractor is not delinquent in the payment of any tax administered by the Illinois Department of Revenue.

Date

Authorized Signature

Title

SECTION 00700

GENERAL CONDITIONS

FORM OF GENERAL CONDITIONS

- 1.1 AIA Document A201, General Conditions of the Contract for Construction, 2017 Edition, attached, is the General Conditions between the Owner and Contractor.**
- 1.2 AIA Document A101-Exhibit A, Insurance and Bonds, 2017 Edition, attached, is the Insurance and Bonds requirements, for the Owner and Contractor, for the project.**
- 1.3 A Letter of Intent to Award a Construction Contract will be issued to the approved contractor upon approval of the Owner. This Letter of Intent shall serve as the Notice to proceed and the Contract for Construction, with all the terms and conditions referenced in the contract documents, until the contract, referenced above, has been fully executed. The awarded contractor shall begin all construction services as specified upon receipt of this Letter of Intent.**

END OF SECTION

DRAFT AIA® Document A201® - 2017

General Conditions of the Contract for Construction

for the following PROJECT:

(Name and location or address)

[Kirby School District 140 - General»](#)
[«REVISED 030422 »](#)

THE OWNER:

(Name, legal status and address)

[«Board of Education - Kirby School District 140»« »](#)
[«16931 South Grissom Drive](#)
[Tinley Park, Illinois 60477»](#)
[»](#)

THE ARCHITECT:

(Name, legal status and address)

[« «Tria Architecture, Inc.»« »](#)
[«901 McClintock Drive, Suite 100](#)
[Burr Ridge, Illinois 60527»](#)

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ARTICLE 1 GENERAL PROVISIONS

§ 1.1 Basic Definitions

§ 1.1.1 The Contract Documents

The Contract Documents ~~are enumerated in the Agreement between the Owner and Contractor (hereinafter the Agreement) and consist of the Agreement,~~ consist of the Invitation to Bid, Instruction to Bidders, Bid Form, Agreement between Owner and Contractor (hereinafter the Agreement), Conditions of the Contract (General, Supplementary and other Conditions), Drawings, Schedules, Specifications, Addenda issued prior to execution of the Contract, other documents listed in the Agreement, and Modifications issued after execution of the Contract. A Modification is (1) a written amendment to the Contract signed by both parties, (2) a Change Order, (3) a Construction Change Directive, ~~or (4)-(4) an Architect's Supplemental Instruction, or (5) a written order for a minor change in the Work issued by the Architect. Unless specifically enumerated in the Agreement, the Contract Documents do not include the advertisement or invitation to bid, Instructions to Bidders, sample forms, other information furnished by the Owner in anticipation of receiving bids or proposals, the Contractor's bid or proposal, or portions of Addenda relating to bidding or proposal requirements.~~

§ 1.1.2 The Contract

The Contract Documents form the Contract for Construction. The Contract represents the entire and integrated agreement between the parties hereto and supersedes prior negotiations, representations, or agreements, either written or oral. The Contract may be amended or modified only by a Modification. The Contract Documents shall not be construed to create a contractual relationship of any kind (1) between the Contractor and the Architect or the Architect's consultants, (2) between the Owner and a Subcontractor or a Sub-subcontractor, (3) between the Owner and the Architect or the Architect's consultants, or (4) between any persons or entities other than the Owner and the Contractor. The Architect shall, however, be entitled to performance and enforcement of obligations under the Contract intended to facilitate performance of the Architect's duties.

§ 1.1.3 The Work

The term "Work" means the construction and services required by the Contract Documents, whether completed or partially completed, and includes all other labor, materials, equipment, and services provided or to be provided by the Contractor to fulfill the Contractor's obligations. The Work may constitute the whole or a part of the Project.

§ 1.1.4 The Project

The Project is the total construction of which the Work performed under the Contract Documents may be the whole or a part and which may include construction by the Owner and by Separate Contractors.

§ 1.1.5 The Drawings

The Drawings are the graphic and pictorial portions of the Contract Documents showing the design, location and dimensions of the Work, generally including plans, elevations, sections, details, schedules, and diagrams. Figured dimensions shall be followed in preference to measurements by scale. All dimensions shall be checked against field measurements of existing conditions to be taken by the Contractor.

§ 1.1.6 The Specifications

The Specifications are that portion of the Contract Documents consisting of the written requirements for materials, equipment, systems, standards and workmanship for the Work, and performance of related services.

§ 1.1.7 Instruments of Service

Instruments of Service are representations, in any medium of expression now known or later developed, of the tangible and intangible creative work performed by the Architect and the Architect's consultants under their respective professional services agreements. Instruments of Service may include, without limitation, studies, surveys, models, sketches, drawings, specifications, and other similar materials.

§ 1.1.8 Initial Decision Maker

The Initial Decision Maker is the person identified in the Agreement to render initial decisions on Claims in accordance with Section 15.2. The Initial Decision Maker shall not show partiality to the Owner or Contractor and shall not be liable for results of interpretations or decisions rendered in good faith.

§ 1.1.9 The term "Contractor" as used herein shall refer to the Contractor or Construction Manager at Risk.

§ 1.2 Correlation and Intent of the Contract Documents

§ 1.2.1 The intent of the Contract Documents is to include all items necessary for the proper execution and completion of the Work by the ~~Contractor~~ Contractor and items reasonably inferable therefrom. The Contract Documents are complementary, and what is required by one shall be as binding as if required by ~~all; performance by the Contractor shall be required only to the extent consistent with the Contract Documents and reasonably inferable from them as being necessary to produce the indicated results.~~ all.

§ 1.2.1.1 The invalidity of any provision of the Contract Documents shall not invalidate the Contract or its remaining provisions. If it is determined that any provision of the Contract Documents violates any law, or is otherwise invalid or unenforceable, then that provision shall be revised to the extent necessary to make that provision legal and enforceable. In such case the Contract Documents shall be construed, to the fullest extent permitted by law, to give effect to the parties' intentions and purposes in executing the Contract.

§ 1.2.1.2 Where conflicts exist within or between parts of the Contract Documents, or between the Contract Documents and applicable standards, codes and ordinances, the Contractor shall seek a clarification in writing from the Architect. In the event that the Architect does not respond within fourteen (14) days, the more stringent or higher quality or greater quantity requirements shall apply.

§ 1.2.1.3 Large-scale drawings take precedence over small-scale drawings, figured dimensions over scaled dimensions and noted materials over graphic representations. Words in singular shall include a plural whenever applicable, or the context so indicates.

§ 1.2.2 Organization of the Specifications into divisions, sections and articles, and arrangement of Drawings shall not control the Contractor in dividing the Work among Subcontractors or in establishing the extent of Work to be performed by any trade.

§ 1.2.3 Unless otherwise stated in the Contract Documents, words that have well-known technical or construction industry meanings are used in the Contract Documents in accordance with such recognized meanings.

§ 1.2.3.1 In the event of conflicts or discrepancies among the Contract Documents, interpretations will be based on the following priorities: 1) The Agreement, 2) Addenda, with those of later date having precedence over those of earlier date. 3) The General Conditions of the Contract for Construction, 4) Drawings and Specifications.

§ 1.3 Capitalization

Terms capitalized in these General Conditions include those that are (1) specifically defined, (2) the titles of numbered articles, or (3) the titles of other documents published by the American Institute of Architects.

§ 1.4 Interpretation

In the interest of brevity the Contract Documents frequently omit modifying words such as "all" and "any" and articles such as "the" and "an," but the fact that a modifier or an article is absent from one statement and appears in another is not intended to affect the interpretation of either statement. The descriptive headings of this Agreement are inserted for convenience only and shall not control or affect the meaning or construction of any provisions following them.

§ 1.5 Ownership and Use of Drawings, Specifications, and Other Instruments of Service

§ 1.5.1 The Architect and the Architect's consultants shall be deemed the authors and owners of their respective Instruments of Service, including the Drawings and Specifications, and retain all common law, statutory, and other reserved rights in their Instruments of Service, including copyrights. The Contractor, Subcontractors, Sub-subcontractors, and suppliers shall not own or claim a copyright in the Instruments of Service. Submittal or distribution to meet official regulatory requirements or for other purposes in connection with the Project is not to be construed as publication in derogation of the Architect's or Architect's consultants' reserved rights.

§ 1.5.2 The Contractor, Subcontractors, Sub-subcontractors, and suppliers are authorized to use and reproduce the Instruments of Service provided to them, subject to any protocols established pursuant to Sections 1.7 and 1.8, solely and exclusively for execution of the Work. All copies made under this authorization shall bear the copyright notice, if any, shown on the Instruments of Service. The Contractor, Subcontractors, Sub-subcontractors, and suppliers may not

use the Instruments of Service on other projects or for additions to the Project outside the scope of the Work without the specific written consent of the Owner, Architect, and the Architect's consultants.

§ 1.6 Notice

§ 1.6.1 Except as otherwise provided in Section 1.6.2, where the Contract Documents require one party to notify or give notice to the other party, such notice shall be provided in writing to the designated representative of the party to whom the notice is addressed and shall be deemed to have been duly served if delivered in person, by mail, by courier, or by electronic transmission if a method for electronic transmission is set forth in the Agreement.

§ 1.6.2 Notice of Claims as provided in Section 15.1.3 shall be provided in writing and shall be deemed to have been duly served only if delivered to the designated representative of the party to whom the notice is addressed by certified or registered mail, or by courier providing proof of delivery.

§ 1.7 Digital Data Use and Transmission

The parties shall agree upon protocols governing the transmission and use of Instruments of Service or any other information or documentation in digital form. The parties will use AIA Document E203™-2013, Building Information Modeling and Digital Data Exhibit, to establish the protocols for the development, use, transmission, and exchange of digital data.

§ 1.8 Building Information Models Use and Reliance

Any use of, or reliance on, all or a portion of a building information model without agreement to protocols governing the use of, and reliance on, the information contained in the model and without having those protocols set forth in AIA Document E203™-2013, Building Information Modeling and Digital Data Exhibit, and the requisite AIA Document G202™-2013, Project Building Information Modeling Protocol Form, shall be at the using or relying party's sole risk and without liability to the other party and its contractors or consultants, the authors of, or contributors to, the building information model, and each of their agents and employees.

ARTICLE 2 OWNER

§ 2.1 General

§ 2.1.1 The Owner is the person or entity identified as such in the Agreement and is referred to throughout the Contract Documents as if singular in number. The Owner shall designate in writing a representative who shall have express authority to bind the Owner with respect to all matters requiring the Owner's approval or authorization. Except as otherwise provided in Section 4.2.1, the Architect does not have such authority. The term "Owner" means the Owner or the Owner's authorized representative.

~~§ 2.1.2 The Owner shall furnish to the Contractor, within fifteen days after receipt of a written request, information necessary and relevant for the Contractor to evaluate, give notice of, or enforce mechanic's lien rights. Such information shall include a correct statement of the record legal title to the property on which the Project is located, usually referred to as the site, and the Owner's interest therein.~~

§ 2.2 Evidence of the Owner's Financial Arrangements Information and Services Required of Owner

~~§ 2.2.1 Prior to commencement of the Work and upon written request by the Contractor, the Owner shall furnish to the Contractor reasonable evidence that the Owner has made financial arrangements to fulfill the Owner's obligations under the Contract. The Contractor shall have no obligation to commence the Work until the Owner provides such evidence. If commencement of the Work is delayed under this Section 2.2.1, the Contract Time shall be extended appropriately. Apart from the main Regional Office of Education permit, all other permits and fees shall be obtained and paid for by the Contractor under the Contract Documents. The Contractor shall be responsible to obtain all temporary permits including, but not limited to, demolition and canopy permits required to execute the Work~~

~~§ 2.2.2 Following commencement of the Work and upon written request by the Contractor, the Owner shall furnish to the Contractor reasonable evidence that the Owner has made financial arrangements to fulfill the Owner's obligations under the Contract only if (1) the Owner fails to make payments to the Contractor as the Contract Documents require; (2) the Contractor identifies in writing a reasonable concern regarding the Owner's ability to make payment when due; or (3) a change in the Work materially changes the Contract Sum. If the Owner fails to provide such evidence, as required, within fourteen days of the Contractor's request, the Contractor may immediately stop the Work and, in that event, shall notify the Owner that the Work has stopped. However, if the request is made because a change in the Work~~

materially changes the Contract Sum under (3) above, the Contractor may immediately stop only that portion of the Work affected by the change until reasonable evidence is provided. If the Work is stopped under this Section 2.2.2, the Contract Time shall be extended appropriately and the Contract Sum shall be increased by the amount of the Contractor's reasonable costs of shutdown, delay and start-up, plus interest as provided in the Contract Documents.

~~§ 2.2.3 After the Owner furnishes evidence of financial arrangements under this Section 2.2, the Owner shall not materially vary such financial arrangements without prior notice to the Contractor.~~

~~§ 2.2.4 Where the Owner has designated information furnished under this Section 2.2 as "confidential," the Contractor shall keep the information confidential and shall not disclose it to any other person. However, the Contractor may disclose "confidential" information, after seven (7) days' notice to the Owner, where disclosure is required by law, including a subpoena or other form of compulsory legal process issued by a court or governmental entity, or by court or arbitrator(s) order. The Contractor may also disclose "confidential" information to its employees, consultants, sureties, Subcontractors and their employees, Sub-subcontractors, and others who need to know the content of such information solely and exclusively for the Project and who agree to maintain the confidentiality of such information.~~

~~§ 2.3 Information and Services Required of the Owner~~

~~§ 2.2.2.2 The Owner shall retain an architect lawfully licensed to practice architecture, or an entity lawfully practicing architecture, in the jurisdiction where the Project is located. That person or entity is identified as the Architect in the Agreement and is referred to throughout the Contract Documents as if singular in number.~~

~~§ 2.2.2.3 If the employment of the Architect terminates, the Owner shall employ a successor whose status under the Contract Documents shall be that of the Architect.~~

~~§ 2.3.1 Except for permits and fees that are the responsibility of the Contractor under the Contract Documents, including those required under Section 3.7.1, the Owner shall secure and pay for necessary approvals, easements, assessments and charges required for construction, use or occupancy of permanent structures or for permanent changes in existing facilities. Surveys. The Owner shall furnish surveys describing physical characteristics, legal limitations and utility locations for the site of the Project, and a legal description of the site. The Contractor shall be entitled to rely on the accuracy of information furnished by the Owner but shall exercise proper precautions relating to the safe performance of the Work.~~

~~§ 2.3.2 The Owner shall retain an architect lawfully licensed to practice architecture, or an entity lawfully practicing architecture, in the jurisdiction where the Project is located. That person or entity is identified as the Architect in the Agreement and is referred to throughout the Contract Documents as if singular in number. furnish information or services required of the Owner by the Contract Documents with reasonable promptness. The Owner shall also furnish any other information or services under the Owner's control and relevant to the Contractor's performance of the Work with reasonable promptness after receiving the Contractor's written request for such information or services.~~

~~§ 2.3.3 If the employment of the Architect terminates, the Owner shall employ a successor to whom the Contractor has no reasonable objection and whose status under the Contract Documents shall be that of the Architect. Unless otherwise provided in the Contract Documents, the Owner shall furnish to the Contractor one copy of the Contract Documents for purposes of making reproductions pursuant to Section 1.5.2.~~

~~§ 2.3.4 The Owner shall furnish surveys describing physical characteristics, legal limitations and utility locations for the site of the Project, and a legal description of the site. The Contractor shall be entitled to rely on the accuracy of information furnished by the Owner but shall exercise proper precautions relating to the safe performance of the Work.~~

~~§ 2.3.5 The Owner shall furnish information or services required of the Owner by the Contract Documents with reasonable promptness. The Owner shall also furnish any other information or services under the Owner's control and relevant to the Contractor's performance of the Work with reasonable promptness after receiving the Contractor's written request for such information or services.~~

~~§ 2.3.6 Unless otherwise provided in the Contract Documents, the Owner shall furnish to the Contractor one copy of the Contract Documents for purposes of making reproductions pursuant to Section 1.5.2.~~

§ 2.4 Owner's Right to Stop the Work

If the Contractor fails to correct Work that is not in accordance with the requirements of the Contract Documents as required by Section 12.2 or repeatedly fails to carry out Work in accordance with the Contract Documents, the Owner may issue a written order to the Contractor to stop the Work, or any portion thereof, until the cause for such order has been eliminated; however, the right of the Owner to stop the Work shall not give rise to a duty on the part of the Owner to exercise this right for the benefit of the Contractor or any other person or ~~entity, except to the extent required by Section 6.1.3.~~entity. The exercise of this right shall not be construed as placing the Owner in charge of the Work or making the Owner responsible for site safety.

§ 2.5 Owner's Right to Carry Out the Work

If the Contractor defaults or neglects to carry out the Work in accordance with the Contract Documents and fails within a ~~ten-day~~seven-day (7) period after receipt of notice from the Owner to commence and continue correction of such default or neglect with diligence and promptness, the Owner ~~may, may immediately,~~ without prejudice to other remedies the Owner may have, correct such default or neglect. ~~Such action by the Owner and amounts charged to the Contractor are both subject to prior approval of the Architect and the Architect may, pursuant to Section 9.5.1, withhold or nullify a Certificate for Payment in whole or in part, to the extent reasonably necessary to reimburse the Owner for the reasonable.~~In such case, an appropriate Change Order shall be issued deducting from payments then or thereafter due the Contractor, the cost of correcting such deficiencies, including Owner's expenses and but not limited to, attorney's fees, compensation for the Architect's additional services made necessary by such default, neglect, or failure. If current and future payments and expenses incurred in connection with such default, neglect or failure. Said Change Order shall be deemed signed by the Contractor for the purposes stated in Section 7.2.1 even if the Contractor fails to physically sign such Change Order. If payments then or thereafter due the Contractor are not sufficient to cover such amounts, the Contractor shall pay the difference to the Owner. If the Contractor disagrees with the actions of the Owner or the Architect, or the amounts claimed as costs to the Owner, the Contractor may file a Claim pursuant to Article 15 at the Owner's option, the excess shall be deducted from any payment thereafter due or shall be paid by the Contractor immediately upon demand of the Owner.. This right shall be in addition to and not in restriction or derogation of the Owner's rights under Article 14 hereof

§ 2.6 ADDITIONAL RIGHTS

The rights stated in Article 2 shall be in addition and not in limitation of any other rights of the Owner granted in the Contract Documents or at law or in equity.

ARTICLE 3 CONTRACTOR

§ 3.1 General

§ 3.1.1 The Contractor is the person or entity identified as such in the Agreement and is referred to throughout the Contract Documents as if singular in number. The Contractor shall be lawfully licensed, if required in the jurisdiction where the Project is located. The Contractor shall designate in writing a representative who shall have express authority to bind the Contractor with respect to all matters under this Contract. The term "Contractor" means the Contractor or the Contractor's authorized representative.

§ 3.1.2 The Contractor shall perform the Work in accordance with the Contract Documents.

§ 3.1.3 The Contractor shall not be relieved of its obligations to perform the Work in accordance with the Contract Documents either by activities or duties of the Architect in the Architect's administration of the Contract, or by tests, inspections or approvals required or performed by persons or entities other than the Contractor.

§ 3.2 Review of Contract Documents and Field Conditions by Contractor

§ 3.2.1 Execution of the Contract by the Contractor is a representation that the Contractor has visited the site, ~~become generally familiar with~~has inspected the local conditions under which the Work is to be performed, and has reviewed the Contract Documents, and correlated personal observations and inspections, and the bid, with all of the requirements of the Contract Documents.

§ 3.2.1.1 It shall be the duty of the Contractor to verify all dimensions given on the Drawings, and to report any error or inconsistency to the Architect before commencing Work.

§ 3.2.1.2 If the Contractor finds any details, construction procedures or materials shown on the Drawings or called for in the Specifications which the Contractor believes may not be satisfactory for the use shown, the Contractor shall so notify the Architect at least five (5) days before bids are due. Signing of the Agreement and starting the Work by the Contractor shall indicate the Contractor's agreement with all details, construction procedures, and materials so shown and/or specified and shall indicate the Contractor's willingness to construct the Project in strict accordance with the Contract Documents and to guarantee the Project in full compliance with the warranty provisions of the Contract Documents. By executing this Agreement, the Contractor further acknowledges that it has satisfied itself as to the nature and location of the Work, the general and local conditions under which the Work is to be performed, including those bearing upon transportation, disposal, handling and storage of materials availability of labor, water, electric power, roads and uncertainties of weather, ground water table or similar physical conditions of the ground, the character, quality and quantity of surface and subsurface materials to be encountered, the character of equipment and facilities needed prior to and during the prosecution of the Work, and all other matters which can in any way affect the Work or the cost thereof. Any failure by the Contractor to become acquainted with all the available information concerning these conditions will not relieve the Contractor from any obligations with respect to the Contract Documents.

§ 3.2.1.3 If Work is required in a manner that makes it impossible to produce the quality required by the Contract Documents, or should discrepancies appear among the Contract Documents, the Contractor shall request in writing an interpretation from the Architect before proceeding with the Work. The Contractor shall perform the work at no additional cost to the Owner in accordance with the Architect's determination.

§ 3.2.2 Because the Contract Documents are complementary, the Contractor shall, before starting each portion of the Work, carefully study and compare the various Contract Documents relative to that portion of the Work, as well as the information furnished by the Owner pursuant to Section 2.3.4, Owner, shall take field measurements of any existing conditions related to that portion of the Work, and shall observe any conditions at the site affecting it. ~~These obligations are for the purpose of facilitating coordination and construction by the Contractor and are not for the purpose of discovering~~ The Contractor shall promptly report to the Owner and the Architect any errors, omissions, or inconsistencies in the Contract Documents; however, the Contractor shall promptly report to the Architect any errors, inconsistencies or omissions discovered by or made known to the Contractor as a request for information in such form as the Architect may require. It is recognized that the Contractor's review is made in the Contractor's capacity as a contractor and not as a licensed design professional, unless otherwise specifically provided in the Contract Documents. Documents. The Contractor shall not be liable to the Owner or Architect for damage resulting from errors, inconsistencies, or omissions in the Contract Documents unless the Contractor recognized or should have recognized such error, inconsistency, or omission, and failed to report it to the Architect, in which case the Contractor shall not be entitled to an increase in the Contract Sum or Contract Time and the Contractor shall bear all attributable costs for correction. The Contractor agrees to release and hold harmless the Owner for errors, inconsistencies or omissions in the Contract Document which should have been discovered by the Contractor.

§ 3.2.3 The Contractor ~~is not required to ascertain that the Contract Documents are in accordance with applicable laws, statutes, ordinances, codes, rules and regulations, or lawful orders of public authorities, but the Contractor shall promptly report to the Architect any nonconformity discovered by or made known to the Contractor as a request for information in such form as the Architect may require~~ shall verify the accuracy of all grades, elevations, existing conditions, dimensions and locations. In all cases of interconnection of the Contractor's Work with existing or other work, the Contractor shall verify at the site all dimensions relating to such existing or other work. Any errors due to the Contractor's failure to so verify all such grades, elevations, existing conditions, locations or dimensions shall be promptly rectified by him without extra cost to the Owner. Neither the Owner nor the Architect guarantee the exactness of grades, elevations, dimensions, existing conditions or locations given on any drawings issued by the Architect or work installed by other contractors.

§ 3.2.4 If the Contractor believes that additional cost or time is involved because of clarifications or instructions the Architect issues in response to the Contractor's notices or requests for information pursuant to Sections 3.2.2 or 3.2.3, the Contractor shall submit Claims as provided in Article 15. If the Contractor fails to perform the obligations of Sections 3.2.2 or 3.2.3, the Contractor shall pay such costs and damages to the Owner, subject to Section 15.1.7, as would have been avoided if the Contractor had performed such obligations. If the Contractor performs ~~those obligations, the obligations in Sections 3.2.2 and 3.2.3,~~ the Contractor shall not be liable to the Owner or Architect for damages resulting from errors, ~~inconsistencies-inconsistencies,~~ or omissions in the Contract Documents, Documents or for differences between field measurements or conditions and the Contract Documents, ~~or for nonconformities of~~

the Contract Documents to applicable laws, statutes, ordinances, codes, rules and regulations, and lawful orders of public authorities unless the Contractor recognized or should have recognized the error, inconsistency, omission, or difference and failed to report it.

§ 3.3 Supervision and Construction Procedures

§ 3.3.1 The Contractor shall supervise and direct the Work, using the Contractor's best skill and attention. The Contractor shall be solely responsible for, and have control over, construction means, methods, techniques, sequences, and procedures, and for coordinating all portions of the Work under the Contract. If the Contract Documents give specific instructions concerning construction means, methods, techniques, sequences, or procedures, the Contractor shall evaluate the jobsite safety thereof and shall be solely responsible for the jobsite safety of such means, methods, techniques, sequences, or procedures. If the Contractor determines that such means, methods, techniques, sequences or procedures may not be safe, the Contractor shall give timely notice to the Owner and Architect, and shall propose alternative means, methods, techniques, sequences, or procedures. The Architect shall evaluate the proposed alternative solely for conformance with the design intent for the completed construction. Unless the Architect objects to the Contractor's proposed alternative, the Contractor shall perform the Work using its alternative means, methods, techniques, sequences, or procedures. The Contractor shall review any construction or installation procedure (including those recommended by any product manufacturer). The Contractor shall provide written notice to the Architect:

- (a) If a specified product deviates from good construction practices.
- (b) If following the Specifications will affect any warranties.
- (c) Any objections which the Contractor may have to the Specifications.

The responsibilities imposed on the Contractor by this Section shall be in addition to, and not be limited by, any and all other provisions of these Contract Documents.

§ 3.3.2 The Contractor shall engage workmen who are skilled in performing the Work and all Work shall be performed with care and skill and in a good workmanlike manner under the full time supervision of the approved superintendent described in Section 3.9.3. The Contractor shall be liable for all property damage including repairs or replacement of the Work and economic losses which proximately result from the breach of this duty. The Contractor shall be responsible to the Owner for the acts and omissions of the Contractor's employees, Subcontractors and their agents and employees, and any other persons or entities performing portions of the Work for, or on behalf of, the Contractor or any of its Subcontractors. Subcontractors or claiming by, through or under the Contractor, and for any damages, losses, costs, and expenses resulting from such acts or omissions.

§ 3.3.3 The Contractor shall be responsible for inspection of portions of Work already performed to determine that such portions are in proper condition to receive subsequent Work.

§ 3.3.4 The Contractor shall not be relieved of obligations to perform the Work in accordance with the Contract Documents either by activities or duties of the Architect in the Architect's administration of the Contract, or by tests, inspections or approvals required of or performed by persons other than the Contractor.

§ 3.3.5 The Contractor shall coordinate all portions of the work with separate Owner-employed contractors, if any.

§ 3.3.6 The Contractor shall assign a competent, technically-trained office project manager to the Project who shall perform all office functions including checking, approving and coordinating shop drawings and approving purchasing and disbursement pay-out requests and correspondence, and responding to Owner inquiries.

§ 3.4 Labor and Materials

§ 3.4.1 Unless otherwise provided in the Contract Documents, the Contractor shall provide and pay for labor, materials, equipment, tools, construction equipment and machinery, water, heat, utilities, transportation, and other facilities and services necessary for proper execution and completion of the Work, whether temporary or permanent and whether or not incorporated or to be incorporated in the Work.

§ 3.4.2 Except in the case of minor changes in the Work approved by the Architect in accordance with Section 3.12.8 or ordered by the Architect in accordance with Section 7.4, the Contractor may make substitutions only with the

written consent of the Owner, after evaluation by the Architect and in accordance with a Change Order or Construction Change Directive. By making requests for substitutions hereunder, the Contractor:

- .1 represents that the Contractor has personally investigated the proposed substitute product and determined that it is equal or superior in all respects to that specified;
- .2 represents that the Contractor will provide the same warranty for the substitution that the Contractor would for that specified;
- .3 certifies that the cost data presented is complete and includes all related costs under this Contract except the Architect's redesign costs, and waives all claims for additional costs related to the substitution which subsequently become apparent; and
- .4 will coordinate the installation of the accepted substitute, making such changes as may be required for the Work to be complete in all respects.

§ 3.4.3 The Contractor shall enforce strict discipline and good order among the Contractor's employees and other persons carrying out the Work. The Contractor shall not permit employment of unfit persons or persons not properly skilled in tasks assigned to them. The Contractor shall be responsible for any damages to property or injuries to persons, or to any other harm, caused by the Contractor's employees.

§ 3.4.4 After the Agreement has been executed, the Owner and the Architect will consider a formal request for the substitution of products in place of those specified only under the conditions set forth in Section 7.5.

§ 3.5 Warranty

§ 3.5.1 The Contractor warrants to the Owner and Architect that materials and equipment furnished under the Contract will be of good quality and new unless the Contract Documents require or permit otherwise. The Contractor further warrants that the Work will conform to the requirements of the Contract Documents and will be free from defects, except for those inherent in the quality of the Work the Contract Documents require or permit. Work, materials, or equipment not conforming to these requirements may be considered defective. The Contractor's warranty excludes remedy for damage or defect caused by abuse, alterations to the Work not executed by the Contractor, improper or insufficient maintenance, improper operation, or normal wear and tear and normal usage, new, unless otherwise required or permitted by the Contract Documents and that the Work will be free from faults and defects and in conformance with the Contract Documents. The warranty will not be affected by the specification of any product or procedure unless the Contractor objects promptly to such product or procedure and advises the Architect of possible substitute products or procedures which will not affect the warranty. This warranty shall not be restricted by the limitations of any manufacturer's warranty. Work not conforming to these requirements, including substitutions not properly approved and authorized, may be considered defective in the Owner's sole discretion. Inability or refusal of the Subcontractor or supplier responsible for the defective work to correct such work shall not excuse the Contractor from performing under the warranty. If required by the Architect, the Contractor shall furnish satisfactory evidence as to the kind and quality of materials and equipment.

§ 3.5.2 All material, equipment, or other special warranties required by the Contract Documents shall be issued in the name of the Owner, or shall be transferable to the Owner, and shall commence in accordance with Section 9.8.4. Unless a specific guarantee is required in a particular division of the Specifications that is longer in duration than one (1) year from the date of Final Completion, the Work shall be guaranteed by the Contractor against defects in material and workmanship for a period of one (1) year from the date of Final Completion (date of issuance of final payment to the Contractor). Such warranty does not preclude Owner's right to bring an action for breach of this Contract.

§ 3.5.3 All material, equipment, or other special warranties required by the Contract Documents shall be issued in the name of the Owner, or shall be transferable to the Owner, and shall commence in accordance with Section 9.8.4.

§ 3.6 Taxes

The Contractor shall pay Retail sales tax shall not be included in the bid amount. The Owner is exempted by Section 3 of the Illinois Use Tax Act (Section 3, House Bill 1610, approved July 31, 1961, Illinois Revised Statutes 1967, Chapter 120, Section 439.3) from paying any of the taxes imposed by the Act and sales to Owner are exempt by Section 2, House Bill 1609, approved July 31, 1961, Illinois Revised statutes 1967, Chapter 120, Section 441) from any of the taxes imposed by the Act. The Department of Revenue of the State of Illinois under Rule No. 15, issued

August 9, 1961, has declared that sales of materials to construction contractors for conversion into real estate for schools, governmental bodies, agencies and instrumentalities are not taxable retail sales. The Contractor shall be responsible for any sales, consumer, use and similar taxes for the Work provided by the Contractor that are legally enacted when bids are received or negotiations concluded, whether or not yet effective or merely scheduled to go into effect.

Work.

§ 3.7 Permits, Fees, Notices and Compliance with Laws

§ 3.7.1 Unless otherwise provided in the Contract Documents, the Contractor shall secure and pay for the building permit as well as for other permits, fees, licenses, and inspections by government agencies. The Contractor shall secure all permits, licenses and inspections necessary for proper execution and completion of the Work that which are customarily secured after execution of the Contract and legally required at the time bids are received or negotiations concluded which are legally required when bids are received.

§ 3.7.1.1 All cash deposits, bonds, fees, inspections, licenses, or permit fees shall be paid for by the Contractor.

§ 3.7.1.2 Prior to submission of all applications for permits, licenses or inspections the Contractor shall submit a copy of the application or written notice to the Owner for approval.

§ 3.7.2 The Contractor shall comply with and give notices required by applicable laws, statutes, ordinances, codes, rules and regulations, and lawful orders of public authorities applicable to performance of the Work.

§ 3.7.3 If the Contractor observes or believes that portions of the Contract Documents are at variance with applicable laws, statutes, ordinances, building codes, and rules and regulations, the Contractor shall promptly notify the Architect and Owner in writing for clarification by the Architect. If the Contractor performs Work knowing it to be contrary to any applicable laws, statutes, ordinances, codes, rules and regulations, or lawful orders of public authorities, or if the Contractor should have reasonably recognized, within construction industry standards, that such Work was performed contrary to any applicable laws, statutes, ordinances, codes, rules and regulations, or lawful orders of public authorities, the Contractor shall assume appropriate responsibility for such Work and shall bear the costs, damages, losses and expenses attributable to correction.

§ 3.7.4 Concealed or Unknown Conditions

If the Contractor encounters conditions at the site that are (1) subsurface or otherwise concealed physical conditions that differ materially from those indicated in the Contract Documents or (2) unknown physical conditions of an unusual nature that differ materially from those ordinarily found to exist and generally recognized as inherent in construction activities of the character provided for in the Contract Documents, the Contractor shall promptly provide notice to the Owner and the Architect before conditions are disturbed and in no event later than 14 days after first observance of the conditions, disturbed.. The Architect will promptly investigate such conditions and, if the Architect determines that they differ materially and cause an increase or decrease in the Contractor's cost of, or time required for, performance of any part of the Work, will recommend that an equitable adjustment be made in the Contract Sum or Contract Time, or both. If the Architect determines that the conditions at the site are not materially different from those indicated in the Contract Documents and that no change in the terms of the Contract is justified, the Architect shall promptly notify the Owner and Contractor, stating the reasons. If either party disputes the Architect's determination or recommendation, that party may submit a Claim as provided in Article 15. The site conditions contemplated by this Section include, but are not limited to, materials containing asbestos, polychlorinated biphenyl (PCB), or hazardous materials as defined in the Contract Documents.

§ 3.7.5 If, in the course of the Work, the Contractor encounters human remains or recognizes the existence of burial markers, archaeological sites or wetlands not indicated in the Contract Documents, the Contractor shall immediately suspend any operations that would affect them and shall notify the Owner and Architect. Upon receipt of such notice, the Owner shall promptly take any action necessary to obtain governmental authorization required to resume the operations. The Contractor shall continue to suspend such operations until otherwise instructed by the Owner but shall continue with all other operations that do not affect those remains or features. Requests for adjustments in the Contract Sum and Contract Time arising from the existence of such remains or features may be made as provided in Article 15.

§ 3.8 Allowances

§ 3.8.1 The Contractor shall include in the Contract Sum all allowances stated in the Contract Documents. Items covered by allowances shall be supplied for such amounts and by such persons or entities as the Owner may direct, but the Contractor shall not be required to employ persons or entities to whom the Contractor has reasonable objection.

§ 3.8.2 Unless otherwise provided in the Contract Documents,

- .1 allowances shall cover the cost to the Contractor of materials and equipment delivered at the site and all required taxes, less applicable trade discounts;
- .2 Contractor's costs for unloading and handling at the site, labor, installation costs, overhead, profit, and other expenses contemplated for stated allowance amounts shall be included in the Contract Sum but not in the allowances; and
- .3 whenever costs are more than or less than allowances, the Contract Sum shall be adjusted accordingly by Change Order. The amount of the Change Order shall reflect (1) the difference between actual costs and the allowances under Section 3.8.2.1 and (2) changes in Contractor's costs under Section 3.8.2.2.

§ 3.8.3 Materials and equipment under an allowance shall be selected by the Owner with reasonable promptness.

§ 3.9 Superintendent

§ 3.9.1 The Contractor shall employ a competent superintendent fluent in the English language and necessary assistants who shall be in attendance at the Project site during performance of the Work. The superintendent shall represent the Contractor, and communications given to the superintendent shall be as binding as if given to the Contractor. Important communications by the superintendent shall be confirmed in writing. Other communications by the superintendent shall be similarly confirmed on written request in each case. Failure of the superintendent to supervise the job properly shall be deemed as a default by the Contractor under the Contract Documents as determined by the Owner with the advice of the Architect.

§ 3.9.2 The Contractor, as soon as practicable after award of the Contract, shall notify the Owner and Architect of the name and qualifications of a proposed superintendent. Within 14 days of receipt of the information, the Architect may notify the Contractor, stating whether the Owner or the Architect (1) has reasonable objection to the proposed superintendent or (2) requires additional time for review. Failure of the Architect to provide notice within the 14-day period shall constitute notice of no reasonable objection. If the Owner has any objection to the proposed superintendent, the Owner shall notify the Contractor in writing within seven (7) days of its objection, and the Contractor shall propose a replacement.

§ 3.9.3 The Contractor shall not employ a proposed superintendent to whom the Owner or Architect has made reasonable and timely objection. The Contractor shall not change the superintendent without the Owner's consent, which shall not unreasonably be withheld or delayed and Architect's written consent.

§ 3.9.4 The Contractor's superintendent must be dedicated solely to the Project and must be at the Project site at all times that Work is being performed at the site, whether the Work is performed by the Contractor's own forces or by any subcontractors. The superintendent must be at the Project site from the first day of on-site activities until a minimum of thirty (30) days after the date of Substantial Completion until all punch list items have been completed. Failure by the Contractor to provide full-time on-site supervision shall constitute grounds for termination of the Contract Documents by the Owner with seven days written notice.

§ 3.10 Contractor's Construction and Submittal Schedules

§ 3.10.1 The Contractor, promptly after being awarded the ~~Contract, shall Project, shall prepare and~~ submit for the Owner's and Architect's information a Contractor's construction schedule for the Work, review its Construction Schedule for the Work of the Contractor. Such Construction Schedule shall not exceed the completion dates, delivery dates or time limits required in the Contract Documents. The Construction Schedule shall be revised by the Contractor at appropriate intervals as required by the conditions of the Work and Project, and shall provide for expeditious execution of the Work and shall be submitted to the Owner and Architect for review and approval. The schedule shall contain detail appropriate for the Project, including (1) the date of commencement of the Work, interim schedule milestone dates, and the date of Substantial Completion; (2) an apportionment of the Work by construction activity; and (3) the time required for completion of each portion of the Work. The schedule shall provide for the orderly

progression of the Work to completion and shall not exceed time limits current under the Contract Documents. The schedule shall be revised at appropriate intervals as required by the conditions of the Work and Project.

§ 3.10.2 ~~The Contractor, promptly after being awarded the Contract and thereafter as necessary to maintain a current submittal schedule, shall submit a submittal schedule for the Architect's approval. The Architect's approval shall not be unreasonably delayed or withheld. The submittal schedule shall (1) be coordinated with the Contractor's construction schedule, and (2) allow the Architect reasonable time to review submittals. If the Contractor fails to submit a submittal schedule, or fails to provide submittals in accordance with the approved submittal schedule, the Contractor shall not be entitled to any increase in Contract Sum or extension of Contract Time based on the time required for review of submittals. Contractor shall prepare and keep current, for the Architect's record only, a schedule of submittals (the "Submittal Schedule") which is coordinated with the approved Construction Schedule and allows the Architect reasonable time, as indicated in the Contract Documents, to review submittals. Neither the Contractor's preparation of the Submittal Schedule nor the Architect's receipt or review shall modify the Contractor's responsibility to make required submittals or to do so in a timely manner to provide for review in accordance with Section 4.2.7 as modified herein.~~

§ 3.10.3 The Contractor shall perform the Work in general accordance with the most recent schedules submitted to the Owner and Architect. The Owner's or Architect's failure to object to a submitted schedule that exceeds time limits current under the Contract Documents shall not relieve the Contractor of its obligations to meet those limits, nor shall it make the Owner or Architect liable for any of the Contractor's damages incurred as a result of increased construction time or not meeting those time limits. Similarly, the Architect's or Owner's failure to object to a Contractor's schedule showing performance in advance of such time limits shall not create or infer any rights in favor of the Contractor for performance in advance of such time limits.

§ 3.10.4 At the time of each Application for Payment, the Contractor shall provide to the Owner and the Architect an update on the Project schedule and a written status report, which includes a description of the progress of the Work and if progress is behind schedule, the Contractor's plan to recover the Work to meet the approved Construction Schedule. The report shall also include a summary of the Contractor's meetings with subcontractors.

§ 3.10.5 The Contractor shall hold meetings at least weekly (or at such intervals as are otherwise acceptable to the Owner and Architect) at the site. The Contractor shall provide the subcontractors, Architect and the Owner with a meeting schedule. The Contractor shall require subcontractors currently working at the site(s) to have a representative present for such meetings.

§ 3.10.6 Within twenty-one (21) days of the award of the Project, the Contractor shall provide a written report to the Architect and the Owner that includes a list of the Contractor's suppliers, a list of materials and equipment to be purchased from suppliers and fabricators, the time required for fabrication, and the scheduled delivery dates for materials and equipment. Copies of the Contractor's purchase orders shall be delivered to the Architect and the Owner as soon as possible after receipt by the Contractor.

§ 3.11 Documents and Samples at the Site

The Contractor shall make available, at the Project site, the Contract Documents, including Change Orders, Construction Change Directives, and other Modifications, in good order and marked currently to indicate field changes and selections made during construction, and the approved Shop Drawings, Product Data, Samples, and similar required submittals. These shall be in electronic form or paper copy, available to the Architect and Owner, and along with all operating manuals for all equipment, shall be available to the Architect at all times and delivered to the Architect for submittal to the Owner upon completion of the Work as a record of the Work as constructed after completion of the Work but before the final Application for Payment.

§ 3.11.1 The Contractor shall maintain at the site(s) one set of record drawings for the Owner and Architect of the as built plans and specifications for concealed work, particularly concealed piping and conduit. Any deviations from conditions shown on the Contract Drawings shall be shown and dimensioned on these record drawings. The Contractor shall develop layout drawings for concealed work that is schematically indicated on Contract Drawings in order to have dimensioned layouts of such concealed work. This requirement does not authorize any deviations without approval of the Architect.

§ 3.11.1.1 The field information in the record drawings to be so marked shall include at a minimum:

- (1) Significant deviations of any nature made during construction;
- (2) Location of underground mechanical and electrical services, utilities, and appurtenances, referenced to permanent surface improvements.
- (3) Location of mechanical and electrical services, utilities, and appurtenances that are concealed in the building, referenced to accessible features of the building.

§ 3.11.2 The Contractor shall maintain and shall require its subcontractors to maintain at the site(s) an accurate record of deviations and changes in the Work from the Contract Documents; shall indicate all such deviations and changes on reproducible transparencies of the Contract Documents; and shall turn over to the Architect upon completion of the Work all such record drawings, documents and information, such as final shop drawings and sketches, marked prints and similar data indicating the as-built conditions. Plumbing, HVAC and Electrical Contractors/Subcontractors shall be required to record all changes or deviations in the work from the Contract Documents. . The cost of recording and transferring the changes or deviations to the transparencies shall be included in the Contract Sum for the respective Work. The as-built transparencies shall be delivered by the Contractor to the Architect prior to the final acceptance of the Project and issuance of final payment.

§ 3.12 Shop Drawings, Product Data and Samples

§ 3.12.1 Shop Drawings are drawings, diagrams, schedules, and other data specially prepared for the Work by the Contractor or a Subcontractor, Sub-subcontractor, manufacturer, supplier, or distributor to illustrate some portion of the Work.

§ 3.12.2 Product Data are illustrations, standard schedules, performance charts, instructions, brochures, diagrams, and other information furnished by the Contractor to illustrate materials or equipment for some portion of the Work.

§ 3.12.3 Samples are physical examples that illustrate materials, equipment, or workmanship, and establish standards by which the Work will be judged.

§ 3.12.4 Shop Drawings, Product Data, Samples, and similar submittals are not Contract Documents. Their purpose is to demonstrate how the Contractor proposes to conform to the information given and the design concept expressed in the Contract Documents for those portions of the Work for which the Contract Documents require submittals. Review by the Architect is subject to the limitations of Section 4.2.7. Informational submittals upon which the Architect is not expected to take responsive action may be so identified in the Contract Documents. Submittals that are not required by the Contract Documents may be returned by the Architect without action.

§ 3.12.5 The Contractor shall review for compliance with the Contract Documents, approve, and submit to the Architect, Shop Drawings, Product Data, Samples, and similar submittals required by the Contract Documents, in accordance with the submittal schedule approved by the Architect or, in the absence of an approved submittal schedule, with reasonable promptness and in such sequence as to cause no delay in the Work or in the activities of the Owner or of Separate Contractors.

§ 3.12.6 By submitting Shop Drawings, Product Data, Samples, and similar submittals, the Contractor represents to the Owner and Architect that the Contractor has (1) reviewed and approved them, (2) determined and verified materials, field measurements and field construction criteria related thereto, or will do so, and (3) checked and coordinated the information contained within such submittals with the requirements of the Work and of the Contract Documents.

§ 3.12.7 The Contractor shall perform no portion of the Work for which the Contract Documents require submittal and review of Shop Drawings, Product Data, Samples, or similar submittals, until the respective submittal has been approved by the Architect.

§ 3.12.8 The Work shall be in accordance with approved submittals except that the Contractor shall not be relieved of responsibility for deviations from the requirements of the Contract Documents by the Architect's approval of Shop

Drawings, Product Data, Samples, or similar submittals, unless the Contractor has specifically notified the Architect of such deviation at the time of submittal and (1) the Architect has given written approval to the specific deviation as a minor change in the Work, or (2) a Change Order or Construction Change Directive has been issued authorizing the deviation. The Contractor shall not be relieved of responsibility for errors or omissions in Shop Drawings, Product Data, Samples, or similar submittals, by the Architect's approval thereof.

§ 3.12.9 The Contractor shall direct specific attention, in writing or on resubmitted Shop Drawings, Product Data, Samples, or similar submittals, to revisions other than those requested by the Architect on previous submittals. In the absence of such notice, the Architect's approval of a resubmission shall not apply to such revisions.

§ 3.12.10 The Contractor shall not be required to provide professional services that constitute the practice of architecture or engineering unless such services are specifically required by the Contract Documents for a portion of the Work or unless the Contractor needs to provide such services in order to carry out the Contractor's responsibilities for construction means, methods, techniques, sequences, and procedures. The Contractor shall not be required to provide professional services in violation of applicable law.

~~**§ 3.12.10.1** If professional design services or certifications by a design professional related to systems, materials, or equipment are specifically required of the Contractor by the Contract Documents, the Owner and the Architect will specify all performance and design criteria that such services must satisfy. The Contractor shall be entitled to rely upon the adequacy and accuracy of the performance and design criteria provided in the Contract Documents. The Contractor shall cause such services or certifications to be provided by an appropriately licensed design professional, whose signature and seal shall appear on all drawings, calculations, specifications, certifications, Shop Drawings, and other submittals prepared by such professional. Shop Drawings, and other submittals related to the Work, designed or certified by such professional, if prepared by others, shall bear such professional's written approval when submitted to the Architect. The Owner and the Architect shall be entitled to rely upon the adequacy and accuracy of the services, certifications, and approvals performed or provided by such design professionals, provided the Owner and Architect have specified to the Contractor the performance and design criteria that such services must satisfy. Pursuant to this Section 3.12.10, the Architect will review and approve or take other appropriate action on submittals only for the limited purpose of checking for conformance with information given and the design concept expressed in the Contract Documents.~~

§ 3.12.10.1. When professional certification or performance criteria of materials, systems or equipment is required by the Contract Documents, the Contractor shall provide the person or party providing the certification with full information of the relevant performance requirements and on the conditions under which the materials, systems, or equipment will be expected to operate at the Project site. The certification shall be based on performance under the operating conditions at the Project site. The Architect shall be entitled to rely on the accuracy and completeness of such certifications.

§ 3.12.10.2 ~~If~~When the Contract Documents require the Contractor's design professional to certify that the Work has been performed in accordance with the design criteria, the Contractor shall furnish such certifications to the Architect at the time and in the form specified by the Architect.

§ 3.13 Use of Site

The Contractor shall confine operations at the site to areas permitted by applicable laws, statutes, ordinances, codes, rules and regulations, lawful orders of public authorities, and the Contract Documents and shall not unreasonably encumber the site with materials or equipment.

§ 3.13.1 Only material and equipment which is to be used directly in the construction of this Project shall be brought to and stored on the job site by the Contractor. After equipment is no longer needed on this Project, it shall be promptly removed from the job site. Protection of all construction materials and equipment stored at the Job Site is the sole responsibility of the Contractor.

§ 3.13.2 The Contractor and its Subcontractors, and their respective employees, agents, and consultants, shall not enter any part or portion of the building work sites when students are present without the Owner's written authorization.

§ 3.14 Cutting and Patching

§ 3.14.1 The Contractor shall be responsible for cutting, fitting, or patching required to complete the Work or to make its parts fit together properly. All areas requiring cutting, fitting, or patching shall be restored to the condition existing prior to the cutting, fitting, or patching, unless otherwise required by the Contract Documents.

§ 3.14.2 The Contractor shall not damage or endanger a portion of the Work or fully or partially completed construction of the Owner or Separate Contractors by cutting, patching, or otherwise altering such construction, or by excavation. The Contractor shall not cut or otherwise alter construction by the Owner or a Separate Contractor except with written consent of the Owner and of the Separate ~~Contractor. Consent Contractor which consent shall not be~~ unreasonably withheld. ~~The Contractor shall not unreasonably withhold, from the Owner or a Separate Contractor, its consent to cutting or otherwise altering the Work. Contractor's consent is not required.~~

§ 3.14.3 Only tradespersons skilled and experienced in cutting and patching shall perform such work.

§ 3.15 Cleaning Up

§ 3.15.1 The Contractor shall keep the premises and surrounding area free from accumulation of waste materials and rubbish caused by operations under the Contract. At completion of the Work, the Contractor shall remove waste materials, rubbish, the Contractor's tools, construction equipment, machinery, and surplus materials from and about the Project. The Contractor shall remove and clean up hazardous materials as required by the Contract Documents and in compliance with all applicable laws, rules regulations and codes.

§ 3.15.2 If the Contractor fails to clean up as provided in the Contract Documents, the Owner may do so and the Owner shall be entitled to reimbursement from the Contractor.

§ 3.15.3 All exterior and interior Work shall be cleaned by the Contractor using specific materials as recommended for surfaces to be cleaned. Damage to any surfaces due to improper cleaning methods of materials shall be repaired to the satisfaction of the Architect and Owner, by the Contractor, at no cost to the Owner.

§ 3.16 Access to Work

The Contractor shall provide the Owner and Architect with access to the Work in preparation and progress at all times and wherever located.

§ 3.17 Royalties, Patents and Copyrights

The Contractor shall pay all royalties and license fees. The Contractor shall defend suits or claims for infringement of copyrights and patent rights and shall hold the Owner and Architect harmless from loss on account thereof, but shall not be responsible for defense or loss when a particular design, process, or product of a particular manufacturer or manufacturers is required by the Contract Documents, or where the copyright violations are contained in Drawings, Specifications, or other documents prepared by the Owner or ~~Architect. Architect, except to the extent of Contractor's~~ fault. However, if an infringement of a copyright or patent is discovered by, or made known to, the Contractor, the Contractor shall be responsible for the loss unless the information is promptly furnished to the Architect.

§ 3.18 Indemnification

§ 3.18.1 To the fullest extent permitted by law, the Contractor ~~shall indemnify and hold harmless the Owner, Architect, Architect's consultants, and agents and employees of any of them from and against claims, damages, losses, waives any right of contribution against and shall defend, indemnify and hold harmless Owner, any Owner's Representative, the Architect and each of their officers, directors, board members, officials, agents, consultants and employees from and against all claims, damages, losses and expenses, including but not limited to attorneys' fees, arising out of or resulting from or in connection with the performance of the Work, provided that such claim, damage, loss, or expense is attributable to bodily injury, sickness, disease or death, or to injury to or destruction of tangible property (other than the Work itself), but only to the extent caused by the negligent acts or omissions of the Contractor, any such claim, damage, loss or expense (these are collectively referred to as "claims") is caused by or alleged to be caused by an act or omission of Contractor, any Subcontractor, anyone directly or indirectly employed by them, or anyone for whose acts they may be liable, regardless of whether or not such claim, damage, loss, or expense any of them or anyone for whose acts any of them may be liable in the performance of the Agreement, regardless of whether or not it is caused in part by a party indemnified hereunder. Such obligation shall not be construed to negate, abridge, or reduce other rights or obligations of indemnity that would otherwise exist as to a otherwise reduce any other right or obligation of indemnity or contribution which would otherwise exist as to any party or person described in this Section 3.18-Contract. The obligations of the Contractor under this Section 3.18.1 shall be construed to include, but~~

not be limited to, injury or damage consequent upon failure to use or misuse by the Contractor, his agents, Sub-Contractors, and employees of any scaffold, hoist, crane, stay, ladder, support, or other mechanical contrivance erected or constructed by any person, or any or all other kinds of equipment, whether or not owned or furnished by the Owner.

§ 3.18.2 In claims against any person or entity indemnified under this Section 3.18 by an employee of the Contractor, a Subcontractor, anyone directly or indirectly employed by them, or anyone for whose acts they may be liable, the indemnification obligation under Section 3.18.1 shall not be limited by a limitation on amount or type of damages, compensation, or benefits payable by or for the Contractor or a Subcontractor under workers' compensation acts, disability benefit acts, or other employee benefit acts. The Contractor agrees to indemnify, defend, save and hold harmless the following indemnitees: The Architect and the Owner, their respective board members, officers, directors, officials, consultants, agents, and employees, individually and collectively, from all claims, demands, actions and the like, of every nature and description, made or instituted, by third parties, arising or alleged to arise out of the work under this Agreement, as a result of any act or omission of either the Contractor or any Subcontractor, or any of their employees or agents. The Contractor and its Subcontractor shall name the Owner, the Architect and their respective board members, officers, officials, directors, agents and employees, individually and collectively, as additional insureds on their commercial general liability for claims arising from the operations of the Contractor/Subcontractor, automobile liability and excess/umbrella coverage which insurance shall be primary coverage as respects the additional insureds. The Contractor and Subcontractor/s shall furnish Owner with copies of such policies prior to beginning any Work.

§ 3.18.3 "Claims, damages, loses and expenses" as these words are used herein shall be construed to include, but not be limited to (1) injury or damage consequent upon the failure of or use or misuse by Contractor, its Subcontractors, agents, servants or employees, of any hoist, rigging, blocking, scaffolding, or any and all other kinds of items of equipment, whether or not the same be owned, furnished or loaned by Owner; (2) all attorneys' fees and costs incurred in defense of the claim or in bringing an action to enforce the provision of this Indemnity or any other indemnity contained in the Contract Documents; and (3) all costs, expenses, lost time, opportunity costs and other similar indirect or incident damages incurred by the party being indemnified or its employees, agents or consultants.

§ 3.18.4 In the event that the Contractor or its Subcontractors are requested but refuse to honor the indemnity obligations hereunder or to provide a defense, then the Contractor or its Subcontractor shall, in addition to all other obligations, pay the cost of bringing any such action to enforce the indemnification set forth in Article 3.18, including attorneys' fees, and shall also pay the costs of all time expended by the parties seeking the defense or indemnification pursuant to Article 3.18 and their employees in the defense of any litigation covered by this indemnity provision at their usual rates, including costs and expenses.

§ 3.18.5 In claims against any person or entity indemnified under this Section 3.18 by an employee of the Contractor, a Subcontractor, anyone directly or indirectly employed by them, or anyone for whose acts they may be liable, the indemnification obligation under Section 3.18.1 shall not be limited by a limitation on amount or type of damages, compensation, or benefits payable by or for the Contractor or a Subcontractor under workers' compensation acts, disability benefit acts, or other employee benefit acts. The Contractor hereby knowingly and intentionally waives the right to assert, under the case of Kotecki v. Cyclops Welding Corp., 146 Ill.2nd 155 (1991) that Contractor's liability may be limited to the amount of its statutory liability under the Workers' Compensation Act, and agrees that Contractor's liability to indemnify and defend the Owner and Architect is not limited by the so called "Kotecki Cap". The Contractor shall include this provision in each of its Subcontract agreements and shall require its Subcontractors to be so bound.

§ 3.18.6 The Contractor shall include in each and every Subcontract with any and all subcontractors and/or material suppliers performing Work and require each and every Subcontractor and/or material supplier performing Work to agree to be bound by all of the provisions 3.18.1 through 3.18.9 under the Contract Documents.

§ 3.18.7 The Contractor's indemnity obligations hereunder shall specifically include all claims and judgments which may be made against the indemnitees under federal or state law or the law of the other governmental bodies having jurisdiction, and further, against claims and judgments arising from violation of public ordinances and requirements of governing authorities due to Contractor's or Contractor's employees method of execution of the Work.

§ 3.18.8 The indemnification provisions of this Section 3.18 are not intended to circumvent the Construction Contract Indemnification for Negligence Act, 740 ILCS 35/0.01 et seq. and shall not be construed as such, but in such a way to effect its enforcement.

§ 3.18.9 The Contractor shall indemnify and hold harmless the Owner in the event of labor or trade union conflicts or disputes between the Contractor and Subcontractors and their respective employees. The Contractor shall endeavor to adjust and resolve such conflicts and disputes which affect the timely completion of the Work. Such conflicts or disputes shall not be a basis or excuse for the violation of the Contract Documents by the Contractor or its Subcontractors, and shall not provide the Contractor with relief from complying with dates for Substantial Completion or Final Completion. Labor or trade union disputes that affect production or delivery of materials or equipment, or the installation, shall be at no cost to the Owner. The Contractor shall notify the Architect and the Owner in writing as soon as possible as to any labor or trade disputes which may affect the Work and its timely completion. In such event, the Contractor shall provide a written proposal to the Architect and the Owner which includes any comparable substitution(s) necessary to complete the Work.

§ 3.18.10 None of the foregoing provisions shall deprive the Owner or the Architect of any action, right or remedy otherwise available to them or either of them at law.

§ 3.19 If the Work is to be performed by trade unions, the Contractor shall make all necessary arrangements to reconcile, without delay, damage, or cost to the Architect or the Owner, any conflict between the Contract Documents and any agreements or regulations of any kind at any time in force among members or councils which regulate or distinguish what activities shall not be included in the Work of any particular trade. In case the progress of the Work is affected by any undue delay in furnishing or installing any items or materials or equipment required under the Contract Documents because of the conflict involving any such agreement or regulation, the Architect may require that other material or equipment of equal kind and quality be provided at no additional cost to the Owner.

ARTICLE 4 ARCHITECT

§ 4.1 General

§ 4.1.1 The Architect is the person or entity retained by the Owner pursuant to Section 2.3.2 and identified as such in the Agreement.

§ 4.1.2 Duties, responsibilities, and limitations of authority of the Architect as set forth in the Contract Documents shall not be restricted, modified, or extended without written consent of the Owner, ~~Contractor~~ and Architect. Consent shall not be unreasonably withheld.

§ 4.1.3 The Architect's and its consultant's services will terminate sixty (60) days after (1) the date of Substantial Completion of the Work or (2) the anticipated date of Substantial Completion identified in the Contract Documents, whichever is earlier. Any services required of the Architect or its consultants after this date will be back-charged to the Contractor by the Owner.

§ 4.2 Administration of the Contract

§ 4.2.1 The Architect will provide administration of the Contract as described in the Contract Documents and will be an Owner's representative during construction until the date the Architect issues the final Certificate for Payment. The Architect will have authority to act on behalf of the Owner only to the extent provided in the Contract Documents.

§ 4.2.2 The Architect will visit the site at intervals ~~appropriate to the stage of construction, or as otherwise agreed with the Owner, as agreed to by Owner and Architect~~ to become generally familiar with the progress and quality of the portion of the Work completed, ~~and to determine in general if the Work observed is being performed in a manner indicating that the Work, when fully Work to endeavor to determine that the Work, when~~ completed, will be in accordance with the Contract ~~Documents. Documents, and to endeavor to guard the Owner against defects and deficiencies in the Work.~~ Documents, and to endeavor to guard the Owner against defects and deficiencies in the Work. However, the Architect will not be required to make exhaustive or continuous on-site inspections to check the quality or quantity of the Work. The Architect will not have control over, charge of, or responsibility for the construction means, methods, techniques, sequences or procedures, or for the safety precautions and programs in connection with the Work, since these are solely the Contractor's rights and responsibilities under the Contract Documents.

§ 4.2.3 On the basis of the site visits, the Architect will keep the Owner reasonably informed about the progress and quality of the ~~portion of the~~ Work completed, and promptly report to the Owner (1) known deviations from the Contract Documents, (2) known deviations from the most recent construction schedule submitted by the Contractor, and (3) defects and deficiencies observed in the Work. The Architect will not be responsible for the Contractor's failure to perform the Work in accordance with the requirements of the Contract Documents. The Architect will not have control over or charge of, and will not be responsible for acts or omissions of, the Contractor, Subcontractors, or their agents or employees, or any other persons or entities performing portions of the Work.

§ 4.2.4 Communications

The Owner and Contractor shall include the Architect in all communications that relate to or affect the Architect's services or professional responsibilities. The Owner shall promptly notify the Architect of the substance of any direct communications between the Owner and the Contractor otherwise relating to the Project. Communications by and with the Architect's consultants shall be through the Architect. Communications by and with Subcontractors and suppliers shall be through the Contractor. Communications by and with Separate Contractors shall be through the Owner. The Contract Documents may specify other communication protocols. However, this Section shall not be deemed to prohibit direct communication between the Owner and the Architect.

§ 4.2.5 Based on the Architect's evaluations of the Contractor's Applications for Payment, the Architect will review and certify the amounts due the Contractor and will issue Certificates for Payment in such amounts. The Contractor shall provide to the Architect (1) mechanics lien waivers for itself and each of its Subcontractors for any monies sought for payment, and (2) sworn statements listing subcontractors and materialmen before issuing Payment Certificates, and if such sworn statement or waivers are not provided, the Architect's Certificates shall be conditioned upon and subject to the receipt of such waivers.

§ 4.2.6 The Architect has authority to reject Work that does not conform to the Contract Documents. Any Work rejected by the Architect shall be reported promptly to the Owner in writing Whenever the Architect considers it necessary or advisable, the Architect will have authority to require inspection or testing of the Work in accordance with Sections 13.4.2 and 13.4.3, whether or not the Work is fabricated, installed or completed. However, neither this authority of the Architect nor a decision made in good faith either to exercise or not to exercise such authority shall give rise to a duty or responsibility of the Architect to the Contractor, Subcontractors, suppliers, their agents or employees, or other persons or entities performing portions of the Work.

§ 4.2.7 The Architect will review and approve, or take other appropriate action upon, the Contractor's submittals such as Shop Drawings, Product Data, and Samples, but only for the limited purpose of checking for conformance with information given and the design concept expressed in the Contract Documents. The Architect's action will be taken in accordance with the submittal schedule approved by the Architect or, in the absence of an approved submittal schedule, with reasonable promptness while allowing sufficient time in the Architect's professional judgment to permit adequate review. Review of such submittals is not conducted for the purpose of determining the accuracy and completeness of other details such as dimensions and quantities, or for substantiating instructions for installation or performance of equipment or systems, all of which remain the responsibility of the Contractor as required by the Contract Documents. The Architect's review of the Contractor's submittals shall not relieve the Contractor of the obligations under Sections 3.3, 3.5, and 3.12. The Architect's review shall not constitute approval of safety precautions or of any construction means, methods, techniques, sequences, or procedures. The Architect's approval of a specific item shall not indicate approval of an assembly of which the item is a component. The Contractor shall make submittals to the Architect in a manner to allow for the Architect's reasonable prompt review and to allow for timely ordering of components of the Work to affect no delay in the Work.

§ 4.2.8 The Architect will prepare Change Orders and Construction Change Directives, and may order minor changes in the Work as provided in Section 7.4. The Architect will investigate and make determinations and recommendations regarding concealed and unknown conditions as provided in Section 3.7.4.

§ 4.2.9 The Architect will conduct inspections to determine the date or dates of Substantial Completion and the date of final completion; issue Certificates of Substantial Completion pursuant to Section 9.8; receive and forward to the Owner, for the Owner's review and records, written warranties and related documents required by the Contract and assembled by the Contractor pursuant to Section 9.10; and issue a final Certificate for Payment pursuant to Section 9.10. Section 9.10; however, the issuance of such final Certificate of Payment shall not bind the Owner to any

payment unless it accepts such final Certificate for Payment. The Owner's acceptance shall not be unreasonably withheld. Additionally, the Architect shall review all warranties and related documents and provide a recommendation to the Owner as to whether the warranties comply with the Contract Documents.

§ 4.2.10 If the Owner and Architect agree, the Architect will provide one or more Project representatives to assist in carrying out the Architect's responsibilities at the site. The Owner shall notify the Contractor of any change in the duties, responsibilities and limitations of authority of the Project representatives.

§ 4.2.11 The Architect will initially interpret and decide matters concerning performance under, and requirements of, the Contract Documents on written request of either the Owner or Contractor. The Architect's response to such requests will be made in writing within any time limits agreed upon or otherwise with reasonable promptness. If the Contractor submits such written request to the Architect, the Contractor will simultaneously provide a copy of such request to the Owner. The Architect will consult with the Owner regarding any request by the Contractor before responding to the Contractor.

§ 4.2.12 Interpretations and decisions of the Architect will be consistent with the intent of, and reasonably inferable from, the Contract Documents and will be in writing or in the form of drawings. When making such interpretations and decisions, the Architect will endeavor to secure faithful performance by both Owner and Contractor, will not show partiality to either, and will not be liable for results of interpretations or decisions rendered in good faith.

§ 4.2.13 The Architect's decisions on matters relating to aesthetic effect will be final if consistent with the intent expressed in the Contract Documents.

§ 4.2.14 The Architect will review and respond to requests for information about the Contract Documents. The Architect's response to such requests will be made in writing within any time limits agreed upon or otherwise with reasonable promptness. If appropriate, the Architect will prepare and issue supplemental Drawings and Specifications in response to the requests for information. The Architect will provide the Owner with a copy of any response provided pursuant to this Section.

ARTICLE 5 SUBCONTRACTORS

§ 5.1 Definitions

§ 5.1.1 A Subcontractor is a person or entity who has a direct contract with the Contractor to perform a portion of the Work at the site. The term "Subcontractor" is referred to throughout the Contract Documents as if singular in number and means a Subcontractor or an authorized representative of the Subcontractor. The term "Subcontractor" does not include a Separate Contractor or the subcontractors of a Separate Contractor.

§ 5.1.2 A Sub-subcontractor is a person or entity who has a direct or indirect contract with a Subcontractor to perform a portion of the Work at the site. The term "Sub-subcontractor" is referred to throughout the Contract Documents as if singular in number and means a Sub-subcontractor or an authorized representative of the Sub-subcontractor.

§ 5.2 Award of Subcontracts and Other Contracts for Portions of the Work

§ 5.2.1 Unless otherwise stated in the Contract Documents, the Contractor, as soon as practicable after award of the Contract, Prior to executing the Contract, the Contractor , shall notify the Owner and Architect of the persons or entities proposed for each principal portion of the Work, including those who are to furnish materials or equipment fabricated to a special design. Within 14 days of receipt of the information, the Architect may notify the Contractor whether the Owner or the Architect (1) has reasonable objection to any such proposed person or entity or (2) requires additional time for review. Failure of the Architect to provide notice within the 14-day period shall constitute notice of no reasonable objection.

§ 5.2.1.1 In addition to the information which may be required prior to the award of the Project, not later than twenty-one (21) days after Notice of Award of the Project, the Contractor shall furnish to the Owner through the Architect the names of persons or entities proposed as manufacturers for each of the products identified in the General Requirements and, where applicable, the name of the installing Subcontractor.

§ 5.2.2 The Contractor shall not contract with a proposed person or entity to whom the Owner or Architect has made reasonable and timely an objection. The Contractor shall not be required to contract with anyone to whom the Contractor has made reasonable objection. All subcontracts between the Contractor and subcontractors shall be made

in writing, shall be assignable to the Owner, and shall contain the following sentence, 'The Owner is an intended third-party beneficiary of this Subcontract.'

§ 5.2.3 If the Owner or Architect has reasonable objection to a person or entity proposed by the Contractor, the Contractor shall propose another to whom the Owner or Architect has no reasonable objection. ~~If the proposed but rejected Subcontractor was reasonably capable of performing the Work, the Contract Sum and Contract Time shall be increased or decreased by the difference, if any, occasioned by such change, and an appropriate Change Order shall be issued before commencement of the substitute Subcontractor's Work. However, no increase in the Contract Sum or Contract Time shall be allowed for such change unless the Contractor has acted promptly and responsively in submitting names as required.~~ objection No additional costs shall be allowed for a change required due to an objection by the Owner, Contractor, or Architect

§ 5.2.4 The Contractor shall not substitute a Subcontractor, person, or entity for one previously selected ~~if the Owner or Architect makes reasonable objection to such substitution without written approval of the Owner. The Contractor further acknowledges and agrees that after award of the Project to the Contractor, any savings on changes to subcontract or substitute subcontractors will be for the benefit of the Owner and will not be used for the benefit of the Contractor or to increase the Contractor's profit on the Project. The foregoing benefit to the Owner shall include any adjustment in the amount of the price of a subcontract to less than the quoted price of the subcontractor upon which the Contractor's fixed bid price or Contract Sum was based. Further, if a manufacturer or supplier of any machinery or equipment, including, but not limited to, heating and air conditioning units or systems, changes specifications or offers incentives, discounts or lower prices after award of the Contract to the Contractor, those savings will inure to the benefit of the Owner and not the Contractor, subcontractor, manufacturer or supplier.~~

§ 5.3 Subcontractual Relations

By appropriate written agreement, the Contractor shall require each Subcontractor, to the extent of the Work to be performed by the Subcontractor, to be bound to the Contractor by terms of the Contract Documents, and to assume toward the Contractor all the obligations and responsibilities, including the responsibility for safety of the Subcontractor's Work that the Contractor, by these Contract Documents, assumes toward the Owner and Architect. Each subcontract agreement shall preserve and protect the rights of the Owner and Architect under the Contract Documents with respect to the Work to be performed by the Subcontractor so that subcontracting thereof will not prejudice such rights, and shall allow to the Subcontractor, unless specifically provided otherwise in the subcontract agreement, the benefit of all rights, remedies, and redress against the Contractor that the Contractor, by the Contract Documents, has against the Owner. Where appropriate, the Contractor shall require each Subcontractor to enter into similar agreements with Sub-subcontractors. The Contractor shall make available to each proposed Subcontractor, prior to the execution of the subcontract agreement, copies of the Contract Documents to which the Subcontractor will be bound, and, upon written request of the Subcontractor, identify to the Subcontractor terms and conditions of the proposed subcontract agreement that may be at variance with the Contract Documents. Subcontractors will similarly make copies of applicable portions of such documents available to their respective proposed Sub-subcontractors.

§ 5.3.1 The Contractor shall be responsible for its Subcontractors and shall carry insurance which covers the Contractor for liability arising from its Subcontractors and shall ensure that its Subcontractors are carrying insurance to protect the Subcontractors as well as the Owner, Architect and Architect's consultants.

§ 5.3.2 The Owner and Architect assume no responsibility for overlapping, gaps or omission of parts of the Work by the Contractor(s) in awarding subcontracts.

§ 5.4 Contingent Assignment of Subcontracts

§ 5.4.1 Each subcontract agreement for a portion of the Work is assigned by the Contractor to the Owner, provided that

- .1 assignment is effective only after termination of the Contract by the Owner for cause pursuant to Section 14.2 and only for those subcontract agreements that the Owner accepts by notifying the Subcontractor and Contractor; and
- .2 assignment is subject to the prior rights of the surety, if any, obligated under bond relating to the Contract.

When the Owner accepts the assignment of a subcontract agreement, the Owner assumes the Contractor's rights and obligations under the subcontract.

~~§ 5.4.2 Upon such assignment, if the Work has been suspended for more than 30 days, the Subcontractor's compensation shall be equitably adjusted for increases in cost resulting from the suspension.~~ Intentionally Deleted.

§ 5.4.3 Upon assignment to the Owner under this Section 5.4, the Owner may further assign the subcontract to a successor contractor or other entity. If the Owner assigns the subcontract to a successor contractor or other entity, the Owner shall nevertheless remain legally responsible for all of the successor contractor's obligations under the subcontract.

ARTICLE 6 CONSTRUCTION BY OWNER OR BY SEPARATE CONTRACTORS

§ 6.1 Owner's Right to Perform Construction and to Award Separate Contracts

§ 6.1.1 The term "Separate Contractor(s)" shall mean other contractors retained by the Owner under separate agreements. The Owner reserves the right to perform construction or operations related to the Project with the Owner's own forces, and with Separate Contractors retained under Conditions of the Contract substantially similar to those of this Contract, including those provisions of the Conditions of the Contract related to insurance and waiver of ~~subrogation.~~

~~subrogation, without altering the Owner's Agreement with the Contractor.~~

§ 6.1.2 When separate contracts are awarded for different portions of the Project or other construction or operations on the site, the term "Contractor" in the Contract Documents in each case shall mean the Contractor who executes each separate Owner-Contractor Agreement.

§ 6.1.3 The Owner shall provide for coordination of the activities of the Owner's own forces and of each Separate Contractor with the Work of the Contractor, who shall cooperate with them. The Contractor shall participate with any Separate Contractors and the Owner in reviewing their construction schedules. The Contractor shall make any revisions to its construction schedule deemed necessary after a joint review and mutual agreement. The construction schedules shall then constitute the schedules to be used by the Contractor, Separate Contractors, and the Owner until subsequently revised.

~~§ 6.1.4 Unless otherwise provided in the Contract Documents, when the Owner performs construction or operations related to the Project with the Owner's own forces or with Separate Contractors, the Owner or its Separate Contractors shall have the same obligations and rights that the Contractor has under the Conditions of the Contract, including, without excluding others, those stated in Article 3, this Article 6, and Articles 10, 11, and 12.~~

§ 6.2 Mutual Responsibility

§ 6.2.1 The Contractor shall afford the Owner and Separate Contractors reasonable opportunity for introduction and storage of their materials and equipment and performance of their activities, and shall connect and coordinate the Contractor's construction and operations with theirs as required by the Contract Documents.

§ 6.2.2 If part of the Contractor's Work depends for proper execution or results upon construction or operations by the Owner or a Separate Contractor, the Contractor shall, prior to proceeding with that portion of the Work, promptly notify the Architect of apparent discrepancies or defects in the construction or operations by the Owner or Separate Contractor that would render it unsuitable for proper execution and results of the Contractor's Work. Failure of the Contractor to notify the Architect of apparent discrepancies or defects prior to proceeding with the Work shall constitute an acknowledgment that the Owner's or Separate Contractor's completed or partially completed construction is fit and proper to receive the Contractor's Work. The Contractor shall not be responsible for discrepancies or defects in the construction or operations by the Owner or Separate Contractor that are not apparent.

§ 6.2.3 The Contractor shall reimburse the Owner for costs the Owner incurs that are payable to a Separate Contractor because of the Contractor's delays, improperly timed activities or defective construction. ~~The Owner shall be responsible to the Contractor for costs the Contractor incurs because of a Separate Contractor's delays, improperly timed activities, damage to the Work or defective construction.~~

§ 6.2.4 The Contractor shall promptly remedy damage that the Contractor ~~wrongfully~~ causes to completed or partially completed construction or to property of the ~~Owner~~ Owner, its officers, agents, employees or subcontractors, or Separate Contractor as provided in Section 10.2.5.

~~§ 6.2.5 The Owner and each Separate Contractor shall have the same responsibilities for cutting and patching as are described for the Contractor in Section 3.14.~~

§ 6.3 Owner's Right to Clean Up

If a dispute arises among the Contractor, Separate Contractors, and the Owner as to the responsibility under their respective contracts for maintaining the premises and surrounding area free from waste materials and rubbish, the Owner may clean up and the Architect will allocate the cost among those responsible.

ARTICLE 7 CHANGES IN THE WORK

§ 7.1 General

§ 7.1.1 Changes in the Work may be accomplished after execution of the Contract, and without invalidating the Contract, by Change Order, Construction Change Directive or order for a minor change in the Work, subject to the limitations stated in this Article 7 and elsewhere in the Contract Documents.

§ 7.1.2 A Change Order shall be based upon agreement among the Owner, Contractor, and Architect. A Construction Change Directive requires agreement by the Owner and Architect and may or may not be agreed to by the Contractor. An order for a minor change in the Work may be issued by the Architect alone.

§ 7.1.3 Changes in the Work shall be performed under applicable provisions of the Contract Documents. The Contractor shall proceed promptly with changes in the Work, unless otherwise provided in the Change Order, Construction Change Directive, or order for a minor change in the Work.

§ 7.1.4 For any changes in the Work requested by the Contractor involving more than a three (3) calendar day extension of time, the Contractor shall submit critical path schedule showing the original schedule and impact of the proposed change justifying the requested extension of time. The Owner may at its option refuse the extension of time and have the Contractor perform the Work within the original schedule provided all reasonable costs for completing the Work including overtime and acceleration costs are included in the Change Order.

§ 7.1.5 If a proposal for extra work is requested by the Owner from the Contractor which involves additional time, at the Owner's option, the Owner may extend the completion date for that portion of the Work included in the change, without extending the Contract Time for the remainder of the Work.

§ 7.1.6 Changes which involve credits to the Contract Sum shall include overhead, profit, general conditions, and bond and insurance costs.

§ 7.1.7 For any adjustments to the Contract Sum based on other than the unit price method, overhead, profit, and General Conditions combined shall be calculated at the following percentages of the cost attributable to the change in the Work:

- .1 For the Contractor for Work performed by the Contractor's own forces, ten percent of the Cost of the Work for the change.
- .2 For the Contractor, for Work performed by the Contractor's Subcontractors five percent of the amount due the Subcontractor.
- .3 For each Subcontractor or Sub-subcontractor involved, for Work performed by that Subcontractor's or Sub-subcontractor's own forces, ten percent of the Cost of Work for the change.
- .4 For each Subcontractor, for Work performed by the Subcontractor's Sub-subcontractors, five percent of the amount due the Sub-subcontractor.
- .5 Costs to which overhead, profit, and general conditions is to be applied shall be determined in accordance with Section 7.3.
- .6 When both additions and credits are involved in any one change, the allowance for overhead and profit shall be figured on the basis of the net increase, if any;

§ 7.1.8 In order to facilitate checking of quotations for extras or credits, all proposals shall be accompanied by:

- .1 A complete itemization of costs including labor, material.
- .2 Subcontractor's, Sub-subcontractor's and material suppliers for their portions of the work itemized to include labor, material.

.3 Labor costs shall be indicated hourly wage and fringe benefits. Labor hours shall be provided for each phase of the work.

.4 Material costs shall include unit costs and units required where applicable.

§ 7.1.9 The Contractor understands that Change Orders to the Contract which increase or decrease the Cost of the Work by \$10,000 or more, or the time of completion by 30 days or more, will require written documentation by the Owner that the changes:

.1 were not reasonably foreseeable at the time the Contract was signed;

.2 were not within the contemplation of the Contract as signed; and

.3 are in the best interest of the Owner or region and authorized by law.

§ 7.1.10 The Contractor shall provide written notice to the Architect and the Owner if overtime labor rates are included in the computation of the cost of a proposed Change Order or Construction Change Directive.

§ 7.1.11 In the event that the Contractor and the Owner do not reach agreement on a Change Order or a Construction Change Directive, the Owner may, in its discretion, delete the labor, materials and equipment that are the subject of the Change Order or the Construction Change Directive from the Work to be performed under the Contract Documents. The Owner shall receive credit from the Contractor for the labor, materials, and equipment, including Contractor overhead and profit attributable to the deleted work. The Owner may complete the deleted work through another contractor or subcontractor.

§ 7.2 Change Orders

§ 7.2.1 A Change Order is a written instrument prepared by the Architect and signed by the Owner, Contractor, and Architect stating their agreement upon all of the following:

.1 The change in the Work;

.2 The amount of the adjustment, if any, in the Contract Sum; and

.3 The extent of the adjustment, if any, in the Contract Time.

§ 7.3 Construction Change Directives

§ 7.3.1 A Construction Change Directive is a written order prepared by the Architect and signed by the Owner and Architect, directing a change in the Work prior to agreement on adjustment, if any, in the Contract Sum or Contract Time, or both. The Owner may by Construction Change Directive, without invalidating the Contract, order changes in the Work within the general scope of the Contract consisting of additions, deletions, or other revisions, the Contract Sum and Contract Time being adjusted accordingly.

§ 7.3.2 A Construction Change Directive shall be used in the absence of total agreement on the terms of a Change Order.

§ 7.3.3 If the Construction Change Directive provides for an adjustment to the Contract Sum, the adjustment shall be based on one of the following methods:

.1 Mutual acceptance of a lump sum properly itemized and supported by sufficient substantiating data to permit evaluation;

.2 Unit prices stated in the Contract Documents or subsequently agreed upon;

.3 Cost to be determined in a manner agreed upon by the parties and a mutually acceptable fixed or percentage fee; or

.4 As provided in Section 7.3.4.

§ 7.3.4 If the Contractor does not respond promptly or disagrees with the method for adjustment in the Contract Sum, the Architect shall determine the adjustment on the basis of reasonable expenditures and savings of those performing the Work attributable to the change, including, in case of an increase in the Contract Sum, an amount for overhead and profit as set forth in the Agreement, or if no such amount is set forth in the Agreement, a reasonable amount. In such case, and also under Section 7.3.3.3, the Contractor shall keep and present, in such form as the Architect may prescribe, an itemized accounting together with appropriate supporting data. Unless otherwise provided in the Contract Documents, costs for the purposes of this Section 7.3.4 shall be limited to the following:

.1 Costs Actual costs of labor, including applicable payroll taxes, fringe benefits required by agreement or custom, workers' compensation insurance, and other employee costs approved by the Architect;

2. ~~Costs~~ Actual costs of materials, supplies, and equipment, including cost of transportation, whether incorporated or consumed;
3. ~~Rental~~ Actual rental costs of machinery and equipment, exclusive of hand tools, whether rented from the Contractor or others;
4. ~~Costs~~ Actual costs of premiums for all bonds and insurance, permit fees, and sales, use, or similar taxes, directly related to the change; and
5. ~~Costs~~ Actual costs of supervision and field office personnel directly attributable to the change. Cost of supervision, unless directly attributable to change, will not be allowable as an itemized cost for any additions (or credited for deletions) unless a change in the Contract Time is made.

Overtime when specifically authorized by the Owner shall be paid for by the Owner on the basis of a premium payment only, plus the cost of insurance and taxes based on the premium payment. Overhead and profit will not be paid by the Owner for overtime. Field tickets must be signed by the Owner or Architect for verification of overtime hours.

§ 7.3.5 If the Contractor disagrees with the adjustment in the Contract Time, the Contractor may make a Claim in accordance with applicable provisions of Article 15.

§ 7.3.6 Upon receipt of a Construction Change Directive, the Contractor shall promptly proceed with the change in the Work involved and advise the Architect of the Contractor's agreement or disagreement with the method, if any, provided in the Construction Change Directive for determining the proposed adjustment in the Contract Sum or Contract Time.

§ 7.3.7 A Construction Change Directive signed by the Contractor indicates the Contractor's agreement therewith, including adjustment in Contract Sum and Contract Time or the method for determining them. ~~Such agreement shall be effective immediately and shall be recorded as a Change Order.~~ Upon resolution of exact scope, Contract Sum change, and Contract Time change, a Change Order shall be prepared incorporating the Construction Change Directive.

§ 7.3.8 The amount of credit to be allowed by the Contractor to the Owner for a deletion or change that results in a net decrease in the Contract Sum shall be computed in accordance with Section 7.3.4 shall be actual net cost as confirmed by the Architect. When both additions and credits covering related Work or substitutions are involved in a change, the allowance for overhead and profit shall be figured on the basis of net ~~increase, increase or decrease,~~ if any, with respect to that change. Also, if the amount of either the credit or the addition is in dispute, the amount of the other, non-disputed item may not be included in Applications for Payment. Overhead and profit will be included in credits to the same extent they are included in additive Change Orders.

§ 7.3.9 Pending final determination of the total cost of a Construction Change Directive to the Owner, the Contractor may request payment for Work completed under the Construction Change Directive in Applications for Payment. The Architect will make an interim determination for purposes of monthly certification for payment for those costs and certify for payment the amount that the Architect determines, in the Architect's professional judgment, to be reasonably justified. The Architect's interim determination of cost shall adjust the Contract Sum on the same basis as a Change Order, subject to the right of either party to disagree and assert a Claim in accordance with Article 15.

§ 7.3.10 When the Owner and Contractor agree with a determination made by the Architect concerning the adjustments in the Contract Sum and Contract Time, or otherwise reach agreement upon the adjustments, such agreement shall be effective immediately and the Architect will prepare a Change Order. Change Orders may be issued for all or any part of a Construction Change Directive.

§ 7.3.11 Change Orders that result in a net decrease in or credit to the Contract Sum must include a credit to the Owner for the Contractor's overhead and profit as described in Section 7.1.7.

§ 7.4 Minor Changes in the Work

The Architect may order minor changes in the Work that are consistent with the intent of the Contract Documents and do not involve an adjustment in the Contract Sum or an extension of the Contract Time. The Architect's order for

minor changes shall be in writing. If the Contractor believes that the proposed minor change in the Work will affect the Contract Sum or Contract Time, the Contractor shall promptly notify the Architect and shall not proceed to implement the change in the Work. If the Contractor performs the Work set forth in the Architect's order for a minor change without prior notice to the Architect that such change will affect the Contract Sum or Contract Time, the Contractor waives any adjustment to the Contract Sum or extension of the Contract Time.

§ 7.5 SUBSTITUTIONS

After the award of the Project, a request by the Contractor for a substitution of materials or equipment in place of those specified in the Contract Documents will be considered only under one or more of the following conditions:

- (a) Required for compliance with interpretation of code requirements or insurance regulations then existing.
- (b) Unavailability of specified products, through no fault of the Contractor.
- (c) Subsequent information discloses inability of specified products to perform properly or to fit in designated space.
- (d) Manufacturer/fabricator refuses to certify or guarantee performance of specified product as required.
- (e) When it is clearly seen, in the judgment of the Architect and with the Owner's approval, that a substitution would be substantially to the Owner's best interests, in terms of cost, time, or other considerations.

Substitution requests shall be written, timely, and accompanied by adequate technical and cost data. Requests shall include a complete description of the proposed substitution, name of the material or equipment for which it is to be substituted, drawings, cuts, performance and test data, and any other data or information necessary for a complete evaluation by the Architect.

ARTICLE 8 TIME

§ 8.1 Definitions

§ 8.1.1 Unless otherwise provided, Contract Time is the period of time, including authorized adjustments, allotted in the Contract Documents for Substantial Completion of the Work.

§ 8.1.2 The date of commencement of the Work is the date established in the Agreement.

§ 8.1.3 The date of Substantial Completion is the date certified by the Architect in accordance with Section 9.8.

§ 8.1.4 The term "day" as used in the Contract Documents shall mean ~~calendar day unless otherwise specifically defined~~ working day, excluding weekends and legal holidays.

§ 8.2 Progress and Completion

§ 8.2.1 Time limits stated in the Contract Documents are of the essence of the Contract. By executing the Agreement, the Contractor confirms that the Contract Time is a reasonable period for performing the Work.

§ 8.2.2 The Contractor shall not knowingly, except by agreement or instruction of the Owner in writing, commence the Work prior to the effective date of insurance required to be furnished by the Contractor and Owner.

§ 8.2.3 The Contractor shall proceed expeditiously with adequate forces and shall achieve Substantial Completion within the Contract Time. The Contractor shall bear all additional costs incurred to meet the Contract Time, which may require working overtime without additional compensation.

§ 8.2.4 The Contractor shall reimburse the Owner for all fees or expenses, including without limitation, the Architect, engineers and legal expenses, for additional services necessitated by Contractor's failure to obtain Substantial Completion within the time established in the agreement, for more than two (2) inspections for Substantial Completion, or for more than one (1) final inspection.

§ 8.3 Delays and Extensions of Time

§ 8.3.1 If the Contractor is delayed at any time in the commencement or progress of the Work by (1) an act or neglect of the Owner or Architect, of an employee of either, or of a Separate Contractor; (2) by changes ordered in the Work; (3) by labor disputes, fire, unusual delay in deliveries, unavoidable casualties, adverse weather conditions documented in accordance with Section 15.1.6.2, or other causes beyond the Contractor's control; (4) by delay authorized by the Owner ~~pending mediation and binding dispute resolution;~~ or (5) by other causes that the ~~Contractor asserts, and the Architect determines,~~ Owner and Architect determine in their sole discretion, justify delay, then the Contract Time shall be extended for such reasonable time as the Architect may determine.

§ 8.3.2 ~~Claims relating to time shall be made in accordance with applicable provisions of Article 15. The Contractor shall not be entitled to recover from the Owner, and hereby waives all rights that it or its Subcontractors or any other person may otherwise have to recovery, any costs, expenses and damages of any nature that it or its Subcontractors or any other person may suffer by reason of delay in the performance of the Work or any portion thereof, the extension of Contract Time granted herein being the Contractor's sole and exclusive remedy.~~

§ 8.3.3 ~~This Section 8.3. The Contractor shall not be entitled to any increase in the Contract Sum as a result of any delays in the progress of the Work. The Contractor's sole remedy for delay shall be an extension of time. This Section 8.3 does not preclude recovery of damages for delay by either party the Owner under other provisions of the Contract Documents.~~

§ 8.3.4 ~~Notwithstanding other provisions in this Contract, Contractor shall not be entitled to any recovery of damages arising out of any event or delay caused within Contractor's control and/or for "Acts of God", including without limitation adverse weather conditions (which shall include typical rain events that can be reasonably predicted through historical data) which prevents such early completion of the Work.~~

§ 8.3.5 ~~Where a delay occurs that is beyond the Contractor's control and when the delay is not reasonably unacceptable, the Contractor has an affirmative duty to mitigate the effect of that delay on the progress of the Work. An extension of the Substantial Completion date will not be granted to the extent that the Contractor breaches said duty to mitigate.~~

ARTICLE 9 PAYMENTS AND COMPLETION

§ 9.1 Contract Sum

§ 9.1.1 The Contract Sum is stated in the Agreement and, including authorized adjustments, is the total amount payable by the Owner to the Contractor for performance of the Work under the Contract Documents.

§ 9.1.2 If unit prices are stated in the Contract Documents or subsequently agreed upon, and if quantities originally contemplated are materially changed so that application of such unit prices to the actual quantities causes substantial inequity to the Owner or Contractor, the applicable unit prices shall be equitably adjusted.

§ 9.2 Schedule of Values

~~Where the Contract is based on a stipulated sum or Guaranteed Maximum Price, the Contractor shall submit a schedule of values to the Architect before the first Application for Payment, allocating the entire Contract Sum to the various portions of the Work. At the pre-construction meeting, the Contractor shall submit to the Owner and the Architect a detailed schedule of values allocating the Contract Sum to various portions of the Work.~~ The schedule of values shall be prepared in the form, and supported by the data to substantiate its accuracy, required by the Architect. This schedule, unless objected to by the Architect, shall be used as a basis for reviewing the Contractor's Applications for Payment. Any changes to the schedule of values shall be submitted to the Architect and supported by such data to substantiate its accuracy as the Architect may require, and unless objected to by the Architect, shall be used as a basis for reviewing the Contractor's subsequent Applications for Payment.

§ 9.3 Applications for Payment

§ 9.3.1 At least ~~ten~~ twenty (20) days before the Owner's submission date for the School Board's review and approval of such payment at the next School Board meeting or, if the Owner's School Board approves otherwise, before the date established for each progress payment, the Contractor shall submit to the Architect an itemized Application for Payment prepared in accordance with the schedule of values, if required under Section 9.2, for completed portions of the Work. The application shall be notarized, if required, and supported by all data substantiating the Contractor's right to payment that the Owner or Architect require, such as copies of requisitions, and releases and waivers of liens

from Subcontractors and suppliers, and shall reflect retainage if provided for in the Contract Documents. [The form of Application for Payment shall be a notarized AIA Document G702, Application and Certification for Payment, supported by AIA Document G703, Continuation Sheet.](#)

§ 9.3.1.1 As provided in Section 7.3.9, such applications may include requests for payment on account of changes in the Work that have been properly authorized by Construction Change Directives, or by interim determinations of the Architect, but not yet included in Change Orders.

§ 9.3.1.2 Applications for Payment shall not include requests for payment for portions of the Work for which the Contractor does not intend to pay a Subcontractor or supplier, unless such Work has been performed by others whom the Contractor intends to pay. [However, this Section will not apply to routine retainage the Contractor intends to withhold from the Subcontractor pursuant to the Subcontract.](#)

§ 9.3.1.3 [No interest will be paid upon retention.](#)

§ 9.3.1.4 [Contractor shall submit all payment requests to the Architect for all work completed during the previous time period. Requests submitted late will not be processed until the following month. Contractor shall include the Contractor's waiver of lien for the full amount and partial subcontractor waivers of lien in the amounts of the previous payment request.](#)

§ 9.3.2 Unless otherwise provided in the Contract Documents, payments shall be made on account of materials and equipment delivered and suitably stored at the site for subsequent incorporation in the Work. ~~If approved in advance by the Owner, payment may similarly be made for materials and equipment suitably stored off the site at a location agreed upon in writing. No certificate shall be issued in favor of the Contractor and no payment will be made by the Owner for material not actually installed and built into the building without prior specific written authorization from the Owner.~~ Payment for materials and equipment stored on or off the site shall be conditioned upon compliance by the Contractor with procedures satisfactory to the Owner to establish the Owner's title to such materials and equipment or otherwise protect the Owner's interest, and shall include the costs of applicable insurance, storage, and transportation to the site, for such materials and equipment stored [off the site. The Contractor shall submit requisitions from suppliers and Subcontractors to substantiate the amounts requested on the Application for Payment for materials or equipment stored on or off site. The Owner shall have no responsibility or liability to the Contractor for the safekeeping of materials and equipment stored at the site or off the site.](#)

§ 9.3.3 The Contractor warrants that title to all Work covered by an Application for Payment will pass to the Owner no later than the time of payment. The Contractor further warrants that upon submittal of an Application for Payment all Work for which Certificates for Payment have been previously issued and payments received from the Owner shall, to the best of the Contractor's knowledge, information, and belief, be free and clear of liens, claims, security interests, or encumbrances, in favor of the Contractor, Subcontractors, suppliers, or other persons or entities that provided labor, materials, and equipment relating to the Work.

§ 9.3.4 [The Contractor shall submit its application for payment as outlined in Section 9.3 on the first of the month, and the Owner will make payment in accordance with the Local Government Prompt Payment Act upon Applications properly certified by the Architect. Each partial payment request shall be made monthly and Contractor shall request payment of ninety percent \(90%\) of the portion of the Contract Sum properly allocable to labor, materials and equipment incorporated in the work less the aggregate of previous payments in each case. Upon reaching Substantial Completion and with prior authorization of the Owner and the Architect, the retainage may be reduced to five \(5%\) for each item that is deemed substantially complete on the subsequent pay application.](#)

§ 9.3.5 [Before each certificate for payment is issued, the Contractor shall furnish to the Architect a complete statement of the amounts due to Subcontractors, parties supplying material, and for his own materials and labor, on AIA Document G702 and G702A "Application and Certificate for Payment."](#)

§ 9.3.6 [A Sworn "Contractor's Affidavit" shall be submitted with each payment request in sufficient form for the Owner to determine Contractor's right to payment and compliance with the Illinois Mechanic's Lien law. Each payment request shall include executed waivers of lien in conformity with information set forth on a properly completed Contractor's Affidavit. In the event that the Owner is satisfied with Contractor's payment procedures, the Owner may accept partial waivers of lien of Subcontractors and suppliers who were included in the immediate](#)

preceding payment. The Contractor shall submit waivers on a current basis in the amount of each Application for Payment, and the Contractor shall submit trailing waivers of lien for each Subcontractor and supplier in the amount of the prior month's Application for Payment with the current Application for Payment. If the Contractor is unable to provide trailing waivers from any Subcontractor or supplier for the prior month's Pay Application with the current Application for Payment, the Owner has the right to modify the requirements to require that the Contractor provide current waivers of lien from Subcontractors and suppliers with each Payment Application as a condition precedent to payment of said Application for Payment.

§ 9.3.7 Upon giving ten (10) days' notice in writing to the Contractor, the full contract retainage may be reinstated, and the retention restored to the basis established in Section 9.3.4 if the manner of completion of the Work and its progress do not remain satisfactory to the Owner, or if any surety of Contractor withholds its consent.

§ 9.3.8 All material necessary for the construction of this Project, delivered upon the premises, shall not be removed from the premises without written consent of the Architect.

§ 9.3.9 The Contractor's request for final payment shall include: (1) the Contractor's Final Lien Waiver in the full amount of the contract; and (2) final lien waivers in the full amount of their contracts from all subcontractors and suppliers for which final lien waivers have not previously been submitted.

§ 9.4 Certificates for Payment

§ 9.4.1 The Architect will, within seven days after receipt of the Contractor's Application for Payment, either (1) issue to the Owner a Certificate for Payment in the full amount of the Application for Payment, with a copy to the Contractor; or (2) issue to the Owner a Certificate for Payment for such amount as the Architect determines is properly due, and notify the Contractor and Owner of the Architect's reasons for withholding certification in part as provided in Section 9.5.1; or (3) withhold certification of the entire Application for Payment, and notify the Contractor and Owner of the Architect's reason for withholding certification in whole as provided in Section 9.5.1.

§ 9.4.2 The issuance of a Certificate for Payment will constitute a representation by the Architect to the Owner, based on the Architect's evaluation of the Work and the data in the Application for Payment, that, to the best of the Architect's knowledge, information, and belief, the Work has progressed to the point indicated, the quality of the Work is in accordance with the Contract Documents, and that the Contractor is entitled to payment in the amount certified. The foregoing representations are subject to an evaluation of the Work for conformance with the Contract Documents upon Substantial Completion, to results of subsequent tests and inspections, to correction of minor deviations from the Contract Documents prior to completion, and to specific qualifications expressed by the Architect. However, the issuance of a Certificate for Payment will not be a representation that the Architect has (1) made exhaustive or continuous on-site inspections to check the quality or quantity of the Work; (2) reviewed construction means, methods, techniques, sequences, or procedures; (3) reviewed copies of requisitions received from Subcontractors and suppliers and other data requested by the Owner to substantiate the Contractor's right to payment; or (4) made examination to ascertain how or for what purpose the Contractor has used money previously paid on account of the Contract Sum.

§ 9.5 Decisions to Withhold Certification

§ 9.5.1 The Architect may withhold a Certificate for Payment in whole or in part, to the extent reasonably necessary to protect the Owner, if in the Architect's opinion the representations to the Owner required by Section 9.4.2 cannot be made. If the Architect is unable to certify payment in the amount of the Application, the Architect will notify the Contractor and Owner as provided in Section 9.4.1. If the Contractor and Architect cannot agree on a revised amount, the Architect will promptly issue a Certificate for Payment for the amount for which the Architect is able to make such representations to the Owner. The Architect may also withhold a Certificate for Payment or, because of subsequently discovered evidence, may nullify the whole or a part of a Certificate for Payment previously issued, to such extent as may be necessary in the Architect's opinion to protect the Owner from loss for which the Contractor is responsible, including loss resulting from acts and omissions described in Section 3.3.2, because of

- .1 defective Work not remedied;
- .2 third party claims filed or reasonable evidence indicating probable filing of such claims, unless security acceptable to the Owner is provided by the Contractor;
- .3 failure of the Contractor to make payments properly to Subcontractors or suppliers for labor, materials or equipment;
- .4 reasonable evidence that the Work cannot be completed for the unpaid balance of the Contract Sum;

- .5 damage to the Owner or a Separate Contractor;
- .6 reasonable evidence that the Work will not be completed within the Contract Time, and that the unpaid balance would not be adequate to cover actual or liquidated damages for the anticipated delay; or
- .7 repeated failure to carry out the Work in accordance with the Contract Documents.

§ 9.5.2 When either party disputes the Architect's decision regarding a Certificate for Payment under Section 9.5.1, in whole or in part, that party may submit a Claim in accordance with Article 15.

§ 9.5.3 When the reasons for withholding certification are removed, certification will be made for amounts previously withheld.

§ 9.5.4 If the Architect withholds certification for payment under Section 9.5.1.3, the Owner may, at its sole option, issue joint checks to the Contractor and to any Subcontractor or supplier to whom the Contractor failed to make payment for Work properly performed or material or equipment suitably delivered. If the Owner makes payments by joint check, the Owner shall notify the Architect and the Contractor shall reflect such payment on its next Application for Payment.

§ 9.6 Progress Payments

§ 9.6.1 After the Architect has issued a Certificate for Payment, the Owner shall make payment in the manner and within the time provided in the Contract Documents, and shall so notify the Architect.

§ 9.6.2 The Contractor shall pay each Subcontractor, no later than seven days after receipt of payment from the Owner, the amount to which the Subcontractor is entitled, reflecting percentages actually retained from payments to the Contractor on account of the Subcontractor's portion of the Work. The Contractor shall, by appropriate agreement with each Subcontractor, require each Subcontractor to make payments to Sub-subcontractors in a similar manner. In the event that the Owner elects to utilize an escrow agent, the Owner and the escrow agent may elect to make payments due the Contractor to the Contractor and its subcontractors.

§ 9.6.3 The Architect will, on request, furnish to a Subcontractor, if practicable, information regarding percentages of completion or amounts applied for by the Contractor and action taken thereon by the Architect ~~and Owner~~ on account of portions of the Work done by such Subcontractor.

§ 9.6.4 The Owner has the right to request written evidence from the Contractor that the Contractor has properly paid Subcontractors and suppliers amounts paid by the Owner to the Contractor for subcontracted Work. If the Contractor fails to furnish such evidence within seven days, the Owner shall have the right to contact Subcontractors and suppliers to ascertain whether they have been properly paid. Neither the Owner nor Architect shall have an obligation to pay, or to see to the payment of money to, a Subcontractor or supplier, except as may otherwise be required by law.

§ 9.6.5 ~~The Contractor's payments to suppliers shall be treated in a manner similar to that provided in Sections 9.6.2, 9.6.3 and 9.6.4. Notwithstanding any language in the Contract Documents to the contrary, or inconsistent with this provision, the Owner shall not be deemed to have waived any claim or right to assert a claim by making any progress payment or final payment.~~

§ 9.6.6 A Certificate for Payment, a progress payment, or partial or entire use or occupancy of the Project by the Owner shall not constitute acceptance of Work not in accordance with the Contract Documents.

§ 9.6.7 Unless the Contractor provides the Owner with a payment bond in the full penal sum of the Contract Sum, payments received by the Contractor for Work properly performed by Subcontractors or provided by suppliers shall be held by the Contractor for those Subcontractors or suppliers who performed Work or furnished materials, or both, under contract with the Contractor for which payment was made by the Owner. Nothing contained herein shall require money to be placed in a separate account and not commingled with money of the Contractor, create any fiduciary liability or tort liability on the part of the Contractor for breach of trust, or entitle any person or entity to an award of punitive damages against the Contractor for breach of the requirements of this provision.

§ 9.6.8 Provided the Owner has fulfilled its payment obligations under the Contract Documents, the Contractor shall defend and indemnify the Owner from all loss, liability, damage or expense, including reasonable attorney's fees and

litigation expenses, arising out of any lien claim or other claim for payment by any Subcontractor or supplier of any tier. Upon receipt of notice of a lien claim or other claim for payment, the Owner shall notify the Contractor. If approved by the applicable court, when required, the Contractor may substitute a surety bond for the property against which the lien or other claim for payment has been asserted.

§ 9.7 Failure of Payment

~~If the Architect does not issue a Certificate for Payment, through no fault of the Contractor, within seven days after receipt of the Contractor's Application for Payment, or if the Owner does not pay the Contractor within seven days after the date established in the Contract Documents, the amount certified by the Architect or awarded by binding dispute resolution, then the Contractor may, upon seven additional days' notice to the Owner and Architect, stop the Work until payment of the amount owing has been received. The Contract Time shall be extended appropriately and the Contract Sum shall be increased by the amount of the Contractor's reasonable costs of shutdown, delay and start-up, plus interest as provided for in the Contract Documents.~~Intentionally Deleted.

§ 9.8 Substantial Completion

§ 9.8.1 Substantial Completion is the stage in the progress of the Work when the Work or designated portion thereof is sufficiently complete in accordance with the Contract Documents so that the Owner can occupy or utilize the Work for its intended use.

§ 9.8.2 When the Contractor considers that the Work, or a portion thereof which the Owner agrees to accept separately, is substantially complete, the Contractor shall prepare and submit to the Architect a comprehensive list of items to be completed or corrected prior to final payment. Failure to include an item on such list does not alter the responsibility of the Contractor to complete all Work in accordance with the Contract Documents. With respect to Work enumerated on the list accompanying the Certificate of Substantial Completion, the guarantee or warranty period shall start at the time of subsequent acceptance of this Work in writing by Owner.

§ 9.8.3 Upon receipt of the Contractor's list, the Architect will make an inspection to determine whether the Work or designated portion thereof is substantially complete. If the Architect's inspection discloses any item, whether or not included on the Contractor's list, which is not sufficiently complete in accordance with the Contract Documents so that the Owner can occupy or utilize the Work or designated portion thereof for its intended use, the Contractor shall, before issuance of the Certificate of Substantial Completion, complete or correct such item upon notification by the Architect. In such case, the Contractor shall then submit a request for another inspection by the Architect to determine Substantial Completion.

§ 9.8.4 When the Work or designated portion thereof is substantially complete, the Architect will prepare a Certificate of Substantial Completion that shall establish the date of Substantial Completion; establish responsibilities of the Owner and Contractor for security, maintenance, heat, utilities, damage to the Work and insurance; and fix the time within which the Contractor shall finish all items on the list accompanying the Certificate. Warranties required by the Contract Documents shall commence on the date of Substantial Completion of the Work or designated portion thereof unless otherwise provided in the Certificate of Substantial Completion.

§ 9.8.5 The Certificate of Substantial Completion shall be submitted to the Owner and Contractor for their written acceptance of responsibilities assigned to them in the Certificate. Upon such acceptance, and consent of surety if any, the Owner shall make payment of retainage applying to the Work or designated portion thereof. Such payment shall be adjusted for Work that is incomplete or not in accordance with the requirements of the Contract ~~Documents.~~Documents

§ 9.9 Partial Occupancy or Use

§ 9.9.1 The Owner may occupy or use any completed or partially completed portion of the Work at any stage when such portion is designated by separate agreement with the Contractor, provided such occupancy or use is consented to by the insurer and authorized by public authorities having jurisdiction over the Project. Such partial occupancy or use may commence whether or not the portion is substantially complete, provided the Owner and Contractor have accepted in writing the responsibilities assigned to each of them for payments, retainage, if any, security, maintenance, heat, utilities, damage to the Work and insurance, and have agreed in writing concerning the period for correction of the Work and commencement of warranties required by the Contract Documents. When the Contractor considers a portion substantially complete, the Contractor shall prepare and submit a list to the Architect as provided under

Section 9.8.2. Consent of the Contractor to partial occupancy or use shall not be unreasonably withheld. The stage of the progress of the Work shall be determined by written agreement between the Owner and Contractor or, if no agreement is reached, by decision of the Architect.

§ 9.9.2 Immediately prior to such partial occupancy or use, the Owner, Contractor, and Architect shall jointly inspect the area to be occupied or portion of the Work to be used in order to determine and record the condition of the Work.

§ 9.9.3 Unless otherwise agreed upon, partial occupancy or use of a portion or portions of the Work shall not constitute acceptance of Work not complying with the requirements of the Contract Documents.

§ 9.10 Final Completion and Final Payment

§ 9.10.1 Upon receipt of the Contractor's notice that the Work is ready for final inspection and acceptance and upon receipt of a final Application for Payment, the Architect will promptly make such inspection. When the Architect finds the Work acceptable under the Contract Documents and the Contract fully performed, the Architect will promptly issue a final Certificate for Payment stating that to the best of the Architect's knowledge, information and belief, and on the basis of the Architect's on-site visits and inspections, the Work has been completed in accordance with the Contract Documents and that the entire balance found to be due the Contractor and noted in the final Certificate is due and payable. ~~The Architect's final Certificate for Payment will constitute a further representation that conditions listed in Section 9.10.2 as precedent to the Contractor's being entitled to final payment have been fulfilled.~~

§ 9.10.2 Neither final payment nor any remaining retained percentage shall become due until the Contractor submits to the Architect (1) an affidavit that payrolls, bills for materials and equipment, and other indebtedness connected with the Work for which the Owner or the Owner's property might be responsible or encumbered (less amounts withheld by Owner) have been paid or otherwise satisfied, (2) a certificate evidencing that insurance required by the Contract Documents to remain in force after final payment is currently in effect, (3) a written statement that the Contractor knows of no reason that the insurance will not be renewable to cover the period required by the Contract Documents, (4) consent of surety, if any, to final payment, (5) documentation of any special warranties, such as manufacturers' warranties or specific Subcontractor warranties, and (6) if required by the Owner, other data establishing payment or satisfaction of obligations, such as receipts and releases and waivers of liens, claims, security interests, or encumbrances arising out of the Contract, to the extent and in such form as may be designated by the Owner. If a Subcontractor refuses to furnish a release or waiver required by the Owner, the Contractor may furnish a bond satisfactory to the Owner to indemnify the Owner against such lien, claim, security interest, or encumbrance. If a lien, claim, security interest, or encumbrance remains unsatisfied after payments are made, the Contractor shall refund to the Owner all money that the Owner may be compelled to pay in discharging the lien, claim, security interest, or encumbrance, including all costs and reasonable attorneys' fees.

~~§ 9.10.3 If, after Substantial Completion of the Work, final completion thereof is materially delayed through no fault of the Contractor or by issuance of Change Orders affecting final completion, and the Architect so confirms, the Owner shall, upon application by the Contractor and certification by the Architect, and without terminating the Contract, make payment of the balance due for that portion of the Work fully completed, corrected, and accepted. If the remaining balance for Work not fully completed or corrected is less than retainage stipulated in the Contract Documents, and if bonds have been furnished, the written consent of the surety to payment of the balance due for that portion of the Work fully completed and accepted shall be submitted by the Contractor to the Architect prior to certification of such payment. Such payment shall be made under terms and conditions governing final payment, except that it shall not constitute a waiver of Claims. Acceptance of final payment by the Contractor, a Subcontractor, or a supplier, shall constitute a waiver of claims by that payee except those previously made in writing and identified by that payee as unsettled at the time of final Application for Payment.~~

§ 9.10.4 ~~The making of final payment shall constitute a waiver of Claims by the Owner except those arising from~~
~~.1 — liens, Claims, security interests, or encumbrances arising out of the Contract and unsettled;~~
~~.2 — failure of the Work to comply with the requirements of the Contract Documents;~~
~~.3 — terms of special warranties required by the Contract Documents; or~~
~~.4 — audits performed by the Owner, if permitted by the Contract Documents, after final payment.~~ Upon satisfaction of the terms and conditions of the Contract and final payment, the Contractor agrees to provide the Owner with a final release and waiver of all liens covering all work performed under the Contract relative to the Project. Said

final waiver of lien shall identify and stated that all Subcontractors have been paid in full and there are no contract balances outstanding and owed to any such Subcontractors.

§ 9.10.5 Acceptance of final payment by the Contractor, a Subcontractor, or a supplier, shall constitute a waiver of claims by that payee except those previously made in writing and identified by that payee as unsettled at the time of final Application for Payment.

§ 9.11 LIQUIDATED DAMAGES

The Contractor is solely responsible for substantially completing the Work by the scheduled Substantial Completion Date for each Phase of the Work. This responsibility includes all work of the Contractor and that of its Subcontractors and suppliers. The Contractor acknowledges that the Owner will suffer significant financial loss, and there will be disruption to the School District community, if the Project is not complete on or before the Substantial Completion Date for the work set forth in the Contract Documents. The Contractor further acknowledges that the measure of such loss and the disruption to the School District community would not be susceptible to precise calculation. To protect the Owner against said loss and disruption to the School District community and not as a penalty, the Owner and the Contractor hereby agree that the Contractor and the Contractor's Surety, if any, shall be liable for and shall pay to the Owner, Liquidated Damages as per the Liquidated Damages Sliding Scale below for each calendar day of delay, per each School campus, per Phase in Substantial Completion. Substantial Completion for the Project refers to all scheduled Work being a minimum of 99% complete.

LIQUIDATED DAMAGES SLIDING SCALE

<u>Original Awarded Bid Cost</u>	<u>Liquidated Damages per Calendar Day</u>
<u>\$0 - \$499,999.99</u>	<u>\$500</u>
<u>\$500,000.00 - \$999,999.99</u>	<u>\$600</u>
<u>\$1,000,000.00 - \$3,999,999.99</u>	<u>\$700</u>
<u>\$4,000,000.00 - \$7,999,999.99</u>	<u>\$800</u>
<u>\$8,000,000.00 - \$11,999,999.99</u>	<u>\$900</u>
<u>\$12,000,000.00 - \$19,999,999.99</u>	<u>\$1,000</u>
<u>\$20,000,000.00 - Above</u>	<u>\$1,500</u>

§ 9.11.2 Payments of Liquidated Damages are in addition to other direct damages that may be incurred by the Owner and not a penalty. All such Liquidated Damages may be set-off against any monies that may be due the Contractor. The Owner's approval or making of progress payments or final payment, with or without knowledge that the Work was untimely, shall not constitute or be deemed a waiver of the Owner's rights or claims, or of the Owner's ability to receive Liquidated Damages under the Contract or common law.

ARTICLE 10 PROTECTION OF PERSONS AND PROPERTY

§ 10.1 Safety Precautions and Programs

The Contractor shall be responsible for initiating, maintaining, and supervising all safety precautions and programs in connection with the performance of the Contract.

§ 10.2 Safety of Persons and Property

§ 10.2.1 The Contractor shall take reasonable precautions for safety of, and shall provide reasonable protection to prevent damage, injury, or loss to

- .1 employees on the Work and other persons who may be affected thereby;
- .2 the Work and materials and equipment to be incorporated therein, whether in storage on or off the site, under care, custody, or control of the Contractor, a Subcontractor, or a Sub-subcontractor; and
- .3 other property at the site or adjacent thereto, such as trees, shrubs, lawns, walks, pavements, roadways, structures, and utilities not designated for removal, relocation, or replacement in the course of construction.

§ 10.2.2 The Contractor shall comply with, and give notices required by applicable laws, statutes, ordinances, codes, rules and regulations, and lawful orders of public authorities, bearing on safety of persons or property or their protection from damage, injury, or loss.

§ 10.2.3 The Contractor shall implement, erect, and maintain, as required by existing conditions and performance of the Contract, reasonable safeguards for safety and protection, including posting danger signs and other warnings against hazards; promulgating safety regulations; and notifying the owners and users of adjacent sites and utilities of the safeguards.

§ 10.2.4 When use or storage of explosives or other hazardous materials or equipment, or unusual methods are necessary for execution of the Work, the Contractor shall exercise utmost care and carry on such activities under supervision of properly qualified personnel.

§ 10.2.5 The Contractor ~~shall~~ shall, at its sole cost and expense, promptly remedy damage and loss (other than damage or loss insured under property insurance required by the Contract Documents) to property referred to in Sections 10.2.1.2 and 10.2.1.3 caused in whole or in part by the Contractor, a Subcontractor, a Sub-subcontractor, or anyone directly or indirectly employed by any of them, or by anyone for whose acts they may be liable and for which the Contractor is responsible under Sections 10.2.1.2 and 10.2.1.3. The Contractor may make a Claim for the cost to remedy the damage or loss to the extent such damage or loss is attributable to acts or omissions of the Owner or Architect or anyone directly or indirectly employed by either of them, or by anyone for whose acts either of them may be liable, and not attributable to the fault or negligence of the Contractor. The foregoing obligations of the Contractor are in addition to the Contractor's obligations under Section 3.18.

§ 10.2.6 The Contractor shall designate a responsible member of the Contractor's organization at the site whose duty shall be the prevention of accidents. This person shall be the Contractor's superintendent unless otherwise designated by the Contractor in writing to the Owner and Architect.

§ 10.2.7 The Contractor shall not permit any part of the construction or site to be loaded so as to cause damage or create an unsafe condition.

§ 10.2.8 Injury or Damage to Person or Property

If either party suffers injury or damage to person or property because of an act or omission of the other party, or of others for whose acts such party is legally responsible, notice of the injury or damage, whether or not insured, shall be given to the other party within a reasonable time not exceeding 21 ~~twenty-one~~ (21) days after discovery. The notice shall provide sufficient detail to enable the other party to investigate the matter.

§ 10.3 Hazardous Materials and Substances

§ 10.3.1 The Contractor is responsible for compliance with any requirements included in the Contract Documents regarding hazardous materials or substances. If the Contractor encounters a hazardous material or substance not addressed in the Contract Documents and if reasonable precautions will be inadequate to prevent foreseeable bodily injury or death to persons resulting from a material or substance, including but not limited to asbestos or polychlorinated biphenyl (PCB), encountered on the site by the Contractor, the Contractor shall, upon recognizing the condition, immediately stop Work in the affected area and notify the Owner and Architect of the condition.

§ 10.3.1.1 The Contractor shall not cause or permit any "Hazardous Materials" (as defined herein) to be brought upon, kept or used in or about the Projects site(s) except to the extent such Hazardous Materials: (1) are necessary for the prosecution of the Work; and (2) have been approved in writing by the Owner and Owner's environmental consultant. Any Hazardous Materials allowed to be used on the Project site(s) shall be used, stored, and disposed of in writing as directed in writing by the Owner and Owner's environmental consultant. Any Hazardous Materials allowed to be used in the Project site(s) shall be used, stored, and disposed of in compliance with all applicable laws relating to such Hazardous Materials. Any unused or surplus hazardous Materials, as well as, any other Hazardous Materials that have been placed, released, or discharged on the Project site(s) by the Contractor or any of its employees, agents, suppliers, or subcontractors, shall be removed from the Project site(s) at the earlier of (1) completion of the Work requiring the use of such Hazardous Materials; (2) the completion of the Work as a whole; or (3) within twenty-four (24) hours following the Owner's demand for such removal. Such removal shall be undertaken by the Contractor at its sole cost and expense and shall be performed in accordance with all applicable laws and regulations. The Contractor shall immediately notify the Owner and Owner's environmental consultant of any release or discharge of any Hazardous Materials on the Project site(s). The Contractor shall provide the Owner and Owner's environmental consultant with copies of all warning labels on products that the Contractor or any of its subcontractors will be using in connection with the Work, and the Contractor shall be responsible for making any and all disclosures required under applicable "Community Right to Know" or similar laws. The Contractor shall not clean or service any tools, equipment, vehicles,

materials, or other items in such a manner as to cause a violation of any laws or regulations relating to Hazardous Materials. All residue and waste materials resulting from any such cleaning or servicing shall be collected and removed from the Project site(s) in accordance with all applicable laws and regulations. The Contractor shall immediately notify the Owner and the Owner's environmental consultant of any citations, orders, or warnings issued to or received by the Contractor, or of which the Contractor otherwise becomes aware, that relate to any Hazardous Materials on the Project site(s). Without limiting any other indemnification provisions pursuant to law or specified in this Agreement, the Contractor shall indemnify, defend (at the Contractor's sole cost, and with legal counsel approved by the Owner), and hold the Owner, Architect and the Owner's environmental consultant harmless from any and all claims, demands, losses, damages, disbursements, liabilities, obligations, fines, penalties, costs, and expenses for removing and remedying the effect of any Hazardous Materials on, under, from, or about the Project site(s), arising out of or relating to, directly or indirectly, the Contractor's or its subcontractor's failures to comply with any of the requirements herein. As used herein, the term "Hazardous Materials" means any hazardous or toxic substances, materials, and wastes listed in the United States Department of transportation Materials Table, or listed by the Environmental Protection Agency as hazardous substances, and all substances, materials, or wastes that are or become regulated under federal, state, or local law.

§ 10.3.2 Upon receipt of the Contractor's notice, the Owner shall obtain the services of a licensed laboratory to verify the presence or absence of the material or substance reported by the Contractor and, in the event such material or substance is found to be present, to cause it to be rendered harmless. Unless otherwise required by the Contract Documents, the Owner shall furnish in writing to the Contractor and Architect the names and qualifications of persons or entities who are to perform tests verifying the presence or absence of the material or substance or who are to perform the task of removal or safe containment of the material or substance. The Contractor and the Architect will promptly reply to the Owner in writing stating whether or not either has reasonable objection to the persons or entities proposed by the Owner. If either the Contractor or Architect has an objection to a person or entity proposed by the Owner, the Owner shall propose another to whom the Contractor and the Architect have no reasonable objection. When the material or substance has been rendered harmless, Work in the affected area shall resume upon written agreement of the Owner and Contractor. By Change Order, the Contract Time shall be extended appropriately and the Contract Sum shall be increased by the amount of the Contractor's reasonable additional costs of shutdown, delay, and start-up.

~~**§ 10.3.3** To the fullest extent permitted by law, the Owner shall indemnify and hold harmless the Contractor, Subcontractors, Architect, Architect's consultants, and agents and employees of any of them from and against claims, damages, losses, and expenses, including but not limited to attorneys' fees, arising out of or resulting from performance of the Work in the affected area if in fact the material or substance presents the risk of bodily injury or death as described in Section 10.3.1 and has not been rendered harmless, provided that such claim, damage, loss, or expense is attributable to bodily injury, sickness, disease or death, or to injury to or destruction of tangible property (other than the Work itself), except to the extent that such damage, loss, or expense is due to the fault or negligence of the party seeking indemnity.~~Intentionally Deleted.

§ 10.3.4 The Owner shall not be responsible under this Section 10.3 for hazardous materials or substances the Contractor brings to the ~~site unless such materials or substances are required by the Contract Documents.~~site. The Owner shall be responsible for hazardous materials or substances required by the Contract Documents, except to the extent of the Contractor's fault or negligence in the use and handling of such materials or substances.

§ 10.3.5 The Contractor shall reimburse the Owner for the cost and expense the Owner incurs (1) for remediation of hazardous materials or substances the Contractor brings to the site and negligently handles, or (2) where the Contractor fails to perform its obligations under Section 10.3.1, except to the extent that the cost and expense are due to the Owner's fault or negligence.

~~**§ 10.3.6** If, without negligence on the part of the Contractor, the Contractor is held liable by a government agency for the cost of remediation of a hazardous material or substance solely by reason of performing Work as required by the Contract Documents, the Owner shall reimburse the Contractor for all cost and expense thereby incurred.~~

§ 10.4 Emergencies

In an emergency affecting safety of persons or property, the Contractor shall act, at the Contractor's discretion, to prevent threatened damage, injury, or loss. Additional compensation or extension of time claimed by the Contractor on account of an emergency shall be determined as provided in Article 15 and Article 7.

ARTICLE 11 INSURANCE AND BONDS

§ 11.1 Contractor's Insurance and Bonds

§ 11.1.1 The Contractor shall purchase and maintain insurance of the types and limits of liability, containing the endorsements, and subject to the terms and conditions, as described in the Agreement, [Exhibit A to this Agreement](#), or elsewhere in the Contract Documents. The Contractor shall purchase and maintain the required insurance from an insurance company or insurance companies lawfully authorized to issue insurance in the jurisdiction where the Project is located. The Owner, Architect, and Architect's consultants shall be named as additional insureds under the Contractor's ~~commercial general liability policy or as otherwise described liability policies~~ [as required](#) in the Contract Documents.

~~§ 11.1.2 The Contractor shall provide surety bonds of the types, for such penal sums, and subject to such terms and conditions as required by the Contract Documents. The Contractor shall purchase and maintain the required bonds from a company or companies lawfully authorized to issue surety bonds in the jurisdiction where the Project is located.~~

[§ 11.1.2. The Contractor shall provide surety bonds of the types, for such penal sums, and subject to such terms and conditions as required in Exhibit A to this Agreement and the Contract Documents. The Contractor shall purchase and maintain the required bonds from a company or companies lawfully authorized to issue surety bonds in the jurisdiction where the Project is located.](#)

§ 11.1.3 Upon the request of any person or entity appearing to be a potential beneficiary of bonds covering payment of obligations arising under the Contract, the Contractor shall promptly furnish a copy of the bonds or shall authorize a copy to be furnished.

§ 11.1.4 **Notice of Cancellation or Expiration of Contractor's Required Insurance.** Within three (3) business days of the date the Contractor becomes aware of an impending or actual cancellation or expiration of any insurance required by the Contract Documents, the Contractor shall provide notice to the Owner of such impending or actual cancellation or expiration. Upon receipt of notice from the Contractor, the Owner shall, unless the lapse in coverage arises from an act or omission of the Owner, have the right to stop the Work until the lapse in coverage has been cured by the procurement of replacement coverage by the Contractor. The furnishing of notice by the Contractor shall not relieve the Contractor of any contractual obligation to provide any required coverage.

§ 11.2 Owner's Insurance

§ 11.2.1 The Owner shall purchase and maintain insurance of the types and limits of liability, containing the endorsements, and subject to the terms and conditions, as described in the Agreement or elsewhere in the Contract Documents. The Owner shall purchase and maintain the required insurance from an insurance company or insurance companies lawfully authorized to issue insurance in the jurisdiction where the Project is located.

~~§ 11.2.2 **Failure to Purchase Required Property Insurance.** If the Owner fails to purchase and maintain the required property insurance, with all of the coverages and in the amounts described in the Agreement or elsewhere in the Contract Documents, the Owner shall inform the Contractor in writing prior to commencement of the Work. Upon receipt of notice from the Owner, the Contractor may delay commencement of the Work and may obtain insurance that will protect the interests of the Contractor, Subcontractors, and Sub-Subcontractors in the Work. When the failure to provide coverage has been cured or resolved, the Contract Sum and Contract Time shall be equitably adjusted. In the event the Owner fails to procure coverage, the Owner waives all rights against the Contractor, Subcontractors, and Sub-subcontractors to the extent the loss to the Owner would have been covered by the insurance to have been procured by the Owner. The cost of the insurance shall be charged to the Owner by a Change Order. If the Owner does not provide written notice, and the Contractor is damaged by the failure or neglect of the Owner to purchase or maintain the required insurance, the Owner shall reimburse the Contractor for all reasonable costs and damages attributable thereto.~~

§ 11.2.3 Notice of Cancellation or Expiration of Owner's Required Property Insurance. Within three (3) business days of the date the Owner becomes aware of an impending or actual cancellation or expiration of any property insurance required by the Contract Documents, the Owner shall provide notice to the Contractor of such impending or actual cancellation or expiration. Unless the lapse in coverage arises from an act or omission of the Contractor: (1) the Contractor, upon receipt of notice from the Owner, shall have the right to stop the Work until the lapse in coverage has been cured by the procurement of replacement coverage by either the Owner or the Contractor; (2) the Contract Time and Contract Sum shall be equitably adjusted; and (3) the Owner waives all rights against the Contractor, Subcontractors, and Sub-subcontractors to the extent any loss to the Owner would have been covered by the insurance had it not expired or been cancelled. If the Contractor purchases replacement coverage, the cost of the insurance shall be charged to the Owner by an appropriate Change Order. The furnishing of notice by the Owner shall not relieve the Owner of any contractual obligation to provide required insurance.

§ 11.3 Waivers of Subrogation – Intentionally Deleted.

§ 11.3.1 ~~The Owner and Contractor waive all rights against (1) each other and any of their subcontractors, sub-subcontractors, agents, and employees, each of the other; (2) the Architect and Architect's consultants; and (3) Separate Contractors, if any, and any of their subcontractors, sub-subcontractors, agents, and employees, for damages caused by fire, or other causes of loss, to the extent those losses are covered by property insurance required by the Agreement or other property insurance applicable to the Project, except such rights as they have to proceeds of such insurance. The Owner or Contractor, as appropriate, shall require similar written waivers in favor of the individuals and entities identified above from the Architect, Architect's consultants, Separate Contractors, subcontractors, and sub-subcontractors. The policies of insurance purchased and maintained by each person or entity agreeing to waive claims pursuant to this section 11.3.1 shall not prohibit this waiver of subrogation. This waiver of subrogation shall be effective as to a person or entity (1) even though that person or entity would otherwise have a duty of indemnification, contractual or otherwise, (2) even though that person or entity did not pay the insurance premium directly or indirectly, or (3) whether or not the person or entity had an insurable interest in the damaged property. Notwithstanding any other provision of the Contract Documents, the Owner shall not, in any manner, be deemed or intended to have waived any right of subrogation which either it, or its insurance carrier(s) may have against the Architect, Contractor, Subcontractor of any tier, or any of their employees, agents, consultants, officers or directors.~~

§ 11.3.2 If during the Project construction period the Owner insures properties, real or personal or both, at or adjacent to the site by property insurance under policies separate from those insuring the Project, or if after final payment property insurance is to be provided on the completed Project through a policy or policies other than those insuring the Project during the construction period, to the extent permissible by such policies, the Owner waives all rights in accordance with the terms of Section 11.3.1 for damages caused by fire or other causes of loss covered by this separate property insurance.

§ 11.4 Loss of Use, Business Interruption, and Delay in Completion Insurance

The Owner, at the Owner's option, may purchase and maintain insurance that will protect the Owner against loss of use of the Owner's property, or the inability to conduct normal operations, due to fire or other causes of loss. The Owner waives all rights of action against the Contractor and Architect for loss of use of the Owner's property, due to fire or other hazards however caused.

§11.5 Adjustment and Settlement of Insured Loss

§ 11.5.1 A loss insured under the Owner's property insurance required by the Agreement shall be adjusted by the Owner as fiduciary and made payable to the Owner as fiduciary for the insureds, as their interests may appear, subject to requirements of any applicable mortgagee clause and of Section 11.5.2. ~~The Owner shall pay the Architect and Contractor their just shares of insurance proceeds received by the Owner, and by appropriate agreements the Architect and Contractor shall make payments to their consultants and Subcontractors. Contractor shall pay the Subcontractors, and by appropriate agreements, written where legally required for validity, shall require Subcontractors to make payments to their Sub-subcontractors~~ in similar manner.

§ 11.5.2 ~~Prior to settlement of an insured loss, the Owner shall notify the Contractor of the terms of the proposed settlement as well as the proposed allocation of the insurance proceeds. The Contractor shall have 14 days from receipt of notice to object to the proposed settlement or allocation of the proceeds. If the Contractor does not object, the Owner shall settle the loss and the Contractor shall be bound by the settlement and allocation. Upon receipt, the Owner~~

~~shall deposit the insurance proceeds in a separate account and make the appropriate distributions. Thereafter, if no other agreement is made or the Owner does not terminate the Contract for convenience, the Owner and Contractor shall execute a Change Order for reconstruction of the damaged or destroyed Work in the amount allocated for that purpose. If the Contractor timely objects to either the terms of the proposed settlement or the allocation of the proceeds, the Owner may proceed to settle the insured loss, and any dispute between the Owner and Contractor arising out of the settlement or allocation of the proceeds shall be resolved pursuant to Article 15. Pending resolution of any dispute, the Owner may issue a Construction Change Directive for the reconstruction of the damaged or destroyed Work. The Owner as fiduciary shall have the power to adjust and settle a loss with insurers.~~

ARTICLE 12 UNCOVERING AND CORRECTION OF WORK

§ 12.1 Uncovering of Work

§ 12.1.1 If a portion of the Work is covered contrary to the Architect's request or to requirements specifically expressed in the Contract Documents, it must, if requested in writing by the Architect, be uncovered for the Architect's examination and be replaced at the Contractor's expense without change in the Contract Time.

§ 12.1.2 If a portion of the Work has been covered that the Architect has not specifically requested to examine prior to its being covered, the Architect may request to see such Work and it shall be uncovered by the Contractor. If such Work is in accordance with the Contract Documents, the Contractor shall be entitled to an equitable adjustment to the Contract Sum and Contract Time as may be appropriate. If such Work is not in accordance with the Contract Documents, the costs of uncovering the Work, and the cost of correction, shall be at the Contractor's expense.

§ 12.2 Correction of Work

§ 12.2.1 Before Substantial Completion

The Contractor shall promptly correct Work rejected by the Architect or failing to conform to the requirements of the Contract Documents, discovered before Substantial Completion and whether or not fabricated, installed or completed. Costs of correcting such rejected Work, including additional testing and inspections, the cost of uncovering and replacement, and compensation for the Architect's services and expenses made necessary thereby, shall be at the Contractor's expense.

§ 12.2.2 After Substantial Final Completion

§ 12.2.2.1 In addition to the Contractor's obligations under Section 3.5, if, within one year after the date of Substantial Final Completion of the Work or designated portion thereof or after the date for commencement of warranties established under Section 9.9.1, or by terms of any applicable special warranty required by the Contract Documents, any of the Work is found to be not in accordance with the requirements of the Contract Documents, the Contractor ~~shall~~ shall, at Contractor's sole cost and expense, correct it promptly after receipt of notice from the Owner to do so, unless the Owner has previously given the Contractor a written acceptance of such condition. The Owner shall give such notice promptly after discovery of the condition. During the one-year period for correction of Work, if the Owner fails to notify the Contractor and give the Contractor an opportunity to make the correction, the Owner waives the rights to require correction by the Contractor and to make a claim for breach of warranty. If the Contractor fails to correct nonconforming Work within a reasonable time during that period after receipt of notice from the Owner or Architect, the Owner may correct it in accordance with Section 2.5.

§ 12.2.2.2 The one-year period for correction of Work shall be extended with respect to portions of Work first performed after Substantial Final Completion by the period of time between Substantial Final Completion and the actual completion of that portion of the Work.

§ 12.2.2.3 ~~The one-year period for correction of Work shall not be extended by corrective Work performed by the Contractor pursuant to this Section 12.2. In the case of any Work performed in correcting defects pursuant to guarantees or warranties provided or referred to by this Article 12, the warranty or guarantee period shall begin anew from the date of the completion or correction of such Work.~~

§ 12.2.3 The Contractor shall remove from the site portions of the Work that are not in accordance with the requirements of the Contract Documents and are neither corrected by the Contractor nor accepted by the Owner.

§ 12.2.4 The Contractor shall bear the cost of correcting destroyed or damaged construction of the Owner or Separate Contractors, whether completed or partially completed, caused by the Contractor's correction or removal of Work that

is not in accordance with the requirements of the Contract ~~Documents~~. Documents and pay all attorney's fees and expenses related thereto immediately upon demand.

§ 12.2.5 Nothing contained in this Section 12.2 shall be construed to establish a period of limitation with respect to other obligations the Contractor has under the Contract Documents. Establishment of the one-year period for correction of Work as described in Section 12.2.2 relates only to the specific obligation of the Contractor to correct the Work, and has no relationship to the time within which the obligation to comply with the Contract Documents may be sought to be enforced, nor to the time within which proceedings may be commenced to establish the Contractor's liability with respect to the Contractor's obligations other than specifically to correct the Work.

§ 12.3 Acceptance of Nonconforming Work

If the Owner prefers to accept Work that is not in accordance with the requirements of the Contract Documents, the Owner may do so instead of requiring its removal and correction, in which case the Contract Sum will be reduced as appropriate and equitable. Such adjustment shall be effected whether or not final payment has been made.

ARTICLE 13 MISCELLANEOUS PROVISIONS

§ 13.1 Governing Law

The Contract shall be governed by the law of the ~~place where the Project is located, excluding that jurisdiction's choice of law rules. If the parties have selected arbitration as the method of binding dispute resolution, the Federal Arbitration Act shall govern Section 15.4.~~ State of Illinois.

§ 13.2 Successors and Assigns

§ 13.2.1 The Owner and Contractor respectively bind themselves, their partners, successors, assigns, and legal representatives to covenants, agreements, and obligations contained in the Contract Documents. Except as provided in Section 13.2.2, neither party to the Contract shall assign the Contract as a whole without written consent of the other. If either party attempts to make an assignment without such consent, that party shall nevertheless remain legally responsible for all obligations under the Contract.

§ 13.2.2 The Owner may, without consent of the Contractor, assign the Contract to a lender providing construction financing for the Project, if the lender assumes the Owner's rights and obligations under the Contract Documents. The Contractor shall execute all consents reasonably required to facilitate the assignment.

§ 13.3 Rights and Remedies

§ 13.3.1 Duties and obligations imposed by the Contract Documents and rights and remedies available thereunder shall be in addition to and not a limitation of duties, obligations, rights, and remedies otherwise imposed or available by law.

§ 13.3.2 No action or failure to act by the Owner, Architect, or Contractor shall constitute a waiver of a right or duty afforded them under the Contract, nor shall such action or failure to act constitute approval of or acquiescence in a breach thereunder, except as may be specifically agreed upon in writing.

§ 13.4.3 The Owner and the Architect reserve the right to accept or reject any substitutions bid upon. If substitutions are not specifically accepted in writing, materials specified as "standard" shall be used in construction of this project.

§ 13.4.4 Any material specified by reference to the number, symbol or title of specific standards, such as Commercial Standards, Federal Specifications, trade association standards, or similar standards, shall comply with requirements in the latest revision thereof and any amendment or supplement thereto in effect on the date of the Instruments of Service, except as limited to type, class or grade, or modified in such reference by a given date. The standards related to, except as modified in the Specifications, shall have full force and effect as though printed in the Specifications.

§ 13.4 Tests and Inspections

§ 13.4.1 Tests, inspections, and approvals of portions of the Work shall be made as required by the Contract Documents and by applicable laws, statutes, ordinances, codes, rules, and regulations or lawful orders of public authorities. Unless otherwise provided, the Contractor shall make arrangements for such tests, inspections, and approvals with an independent testing laboratory or entity acceptable to the Owner, or with the appropriate public authority, and shall bear all related costs of tests, inspections, and approvals. The Contractor shall give the Architect

timely notice of when and where tests and inspections are to be made so that the Architect may be present for such procedures. The Owner shall bear costs of tests, inspections, or approvals that do not become requirements until after bids are received or negotiations concluded. The Owner shall directly arrange and pay for tests, inspections, or approvals where building codes or applicable laws or regulations so require.

§ 13.4.2 If the Architect, Owner, or public authorities having jurisdiction determine that portions of the Work require additional testing, inspection, or approval not included under Section 13.4.1, the Architect will, upon written authorization from the Owner, instruct the Contractor to make arrangements for such additional testing, inspection, or approval, by an entity acceptable to the Owner, and the Contractor shall give timely notice to the Architect of when and where tests and inspections are to be made so that the Architect may be present for such procedures. Such costs, ~~except as provided in Section 13.4.3,~~ shall be at the ~~Owner's Contractor's~~ expense.

§ 13.4.3 If procedures for testing, inspection, or approval under Sections 13.4.1 and 13.4.2 reveal failure of the portions of the Work to comply with requirements established by the Contract Documents, all costs made necessary by such failure, including those of repeated procedures and compensation for the Architect's services and expenses, shall be at the Contractor's expense. Notwithstanding any other term or provision in this Article 13 to the contrary, in the event that any testing or inspection of the Work or any part thereof reveals defects in materials or workmanship, then the Contractor shall remedy such defects and shall bear all costs and expenses associated with such testing which is related to determining whether such defects have been properly remedied.

§ 13.4.4 Required certificates of testing, inspection, or approval shall, unless otherwise required by the Contract Documents, be secured by the Contractor and promptly delivered to the Architect.

§ 13.4.5 If the Architect is to observe tests, inspections, or approvals required by the Contract Documents, the Architect will do so promptly and, where practicable, at the normal place of testing.

§ 13.4.6 Tests or inspections conducted pursuant to the Contract Documents shall be made promptly to avoid unreasonable delay in the Work.

§ 13.5 Interest

~~Payments due and unpaid under the Contract Documents shall bear interest from the date payment is due at the rate the parties agree upon in writing or, in the absence thereof, at the legal rate prevailing from time to time at the place where the Project is located. Any references in this Agreement to interest being assessed against the Owner are hereby deleted.~~

§ 13.6 Intentionally Deleted.

§ 13.7 REGULATIONS

§ 13.7.1 The Contractor and/or Subcontractor warrant/s that it is familiar with and it shall comply with Federal, State and local laws, statutes, ordinances, rules and regulations, School Board Rules and Policies, and the orders and decrees of any courts or administrative bodies or tribunals in any manner affecting the performance of the contract including without limitation Workmen's Compensation Laws, minimum salary and wage statutes and regulations, laws with respect to permits and licenses and fees in connection therewith, laws regarding maximum working hours, and, without limitation, such other laws and regulations as are specifically described below. Additionally, Contractor and subcontractor warrant that s/he shall comply with any amendments to such Federal, State and local laws, statutes, ordinances, rules and regulations that are enacted thereafter during the performance of the Work and under this Agreement. To the extent that there are any violations of any of the applicable laws, rules, regulations and/or court orders/decrees mentioned herein, Contractor and Subcontractor shall be responsible for indemnifying and holding both the Owner and Architect free and harmless from all costs, fees and expenses incurred, directly or indirectly and including without limitation attorneys' fees, by the Owner or the Architect in responding to and complying with demands made by any of the governmental departments/agencies and/or the courts, or an aggrieved employee or person and such amounts may be withheld from the payments to be made on the project. It is the intention that the Owner and Architect shall suffer no time loss or other additional expenses in complying with any inquiry made with regard to any compliance with the applicable laws, rules and regulations referenced herein. No plea of misunderstanding or ignorance thereof will be considered.

§ 13.7.1.1 Whenever required or upon the request of the Architect or Owner, the Contractor or Subcontractor shall furnish the Architect and the Owner with satisfactory proof of compliance with said Federal, State and local laws, statutes, ordinances, rules, regulations, orders, and decrees.

§ 13.7.2 The Contractor shall comply with the non-discrimination federal, state and local laws, including without limitation:

§ 13.7.2.1 Equal Employment Opportunities Act, American with Disabilities Act and Human Rights Act. The Contractor acknowledges that this Contract is subject to and governed by the rules and regulations of the Illinois Human Rights Act (the "Human Rights Act"), including the mandatory provisions that each contractor have in place written sexual harassment policies that shall include, at minimum, the following information: (i) the illegality of sexual harassment; (ii) the definition of sexual harassment under state law; (iii) a description of sexual harassment, utilizing examples; (iv) the vendor's internal complaint process including penalties; (v) the legal recourse, investigation and complaint process available through the Department and the Commission; and (vii) protection against retaliation as provided by Section 6-101 of said Act and that it has a written sexual harassment policy in place in full compliance with Section 105(A)(4) of the Human Rights Act, 775 LICs 5/2-105(A)(4). The Contractor agrees to fully comply with the requirements of the Illinois Human Rights Act, 775 LICs 5/1-101 et seq., including but not limited to, the provision of sexual harassment policies and procedures pursuant to Section 2-105 of the Act. The Contractor further agrees to comply with all federal Equal Employment Opportunity Laws, including, but not limited to, the Americans with Disabilities Act, 42 U.S.C. Section 12101 et seq., and rules and regulations promulgated thereunder. The provisions of Section 14.2 are included in this Amendment pursuant to the requirements of the regulations of the Illinois Department of Human Rights, Title 44, Part 750, of the Illinois Administrative Code, and Contractor shall be required to comply with these provisions only if and to the extent they are applicable under the law.

§ 13.7.2.2 As required by Illinois law, in the event of the Contractor's non-compliance with the provisions of this Equal Employment Opportunity Clause, the Illinois Human Rights Act or the Rules and Regulations of the Illinois Department of Human Rights ("Department"), the Contractor may be declared ineligible for future contracts or subcontracts with the State of Illinois or any of its political subdivisions or municipal corporations, and the Contract may be canceled or voided in whole or in part, and such other sanctions or penalties may be imposed or remedies invoked as provided by statute or regulation. During the performance of this Contract, the Contractor agrees as follows:

§ 13.7.2.2.1 That it will not discriminate against any employee or applicant for employment because of race, color, religion, creed, sex, marital status, national origin or ancestry, age, citizenship, physical or mental handicap or disability, military status, unfavorable discharge from military service or arrest record status, or any other basis that is currently protected by applicable law; and further that it will examine all job classifications to determine if minority persons or women are underutilized and will take appropriate affirmative action to rectify any such underutilization.

§ 13.7.2.2.2 That, in all solicitations or advertisements for employees placed by it or on its behalf, it will state that all applicants will be afforded equal opportunity without discrimination because of race, color, religion, sex, marital status, national origin or ancestry, age, physical or mental handicap unrelated to ability, an unfavorable discharge from military service, or any other basis that is currently protected by applicable law.

§ 13.7.2.2.3 That it will submit reports as required by the Department's Rules, furnish all relevant information as may from time to time be requested by the Department or the contracting agency, and in all respect comply with the Illinois Human Rights Act and the Department's Rules.

§ 13.7.2.2.4 That it will permit access to all relevant books, records, accounts and work sites by personnel of the contracting agency and the Department for purposes of investigation to ascertain compliance with the Illinois Human Rights Act and the Department's Rules.

§ 13.7.2.2.5 That it will include verbatim or by reference the provisions of this clause in every subcontract it awards under which any portion of the Contract obligations are undertaken or assumed, so that such provisions will be binding upon such subcontractor. In the same manner as with other provisions of this Contract, the Contractor will be liable for compliance with applicable provisions of this clause by such subcontractors; and further it will promptly notify the contracting agency and the Department in the event any subcontractor fails or refuses to comply therewith. In addition, the Contractor will not utilize any subcontractor declared by the Illinois Human Rights Commission to be

ineligible for Contractors or subcontracts with the State of Illinois or any of its political subdivisions or municipal corporation.

§ 13.7.3 Illinois Department of Labor Requirements and Prevailing Wage Act.

§ 13.7.3.1 The Contractor agrees to comply with and that this Agreement is subject to and governed by the Illinois Prevailing Wage Act (820 ILCS 130/0.01 et seq.). The Contractor shall ensure that any Subcontractors shall comply with the Illinois Prevailing Wage Act. Contractor and Subcontractors shall include in Bids the cost for the current prevailing wage. As changes are made in these prevailing wages, the Contractor and Subcontractors performing work on the project will be responsible for conforming to the changes and shall have the responsibility for determining when changes are made. No additional costs are to be incurred by the Owner as a result of changes in the prevailing wage. All record keeping requirements are the obligation of the Contractor and Subcontractors.

§ 13.7.3.2 To the extent that there are any violations of the Prevailing Wage Act and any demands are made upon the Owner, Contractor or Architect by the Illinois Department of Labor or by any employee of the Contractor or a Subcontractor performing work on the project, the Contractor or the particular Subcontractor and Contractor shall be responsible for indemnifying and holding the Owner, Contractor and Architect free and harmless from all costs incurred, directly or indirectly, by the Owner, Contractor or Architect in responding to and complying with demands made by the Department of Labor, or an aggrieved employee and such amounts may be withheld from the payments to be made on the project. It is the intention that the Owner, Contractor and Architect shall suffer no time loss or other additional expenses in complying with any inquiry made with regard to this Act.

§ 13.7.3.3 It shall be mandatory upon the Contractor and upon any Subcontractors thereof to pay all laborers, workman, and mechanics employed by them not less than the prevailing wages in the locality for each craft or type of workman or mechanic needed to perform such work and the general prevailing rate for legal holidays and overtime work as ascertained by the Illinois Department of Labor and pursuant to Illinois law and statutes in such case made and provided.

§ 13.7.3.4 Not used

§ 13.7.3.5 Upon 2 business days' notice, the Contractor and each Subcontractor shall make available for inspection the records identified in the Prevailing Wage Act to the Owner in charge of the project, its officers and agents, and to the Director of Labor and his deputies and agents. Upon 2 business days' notice, the Contractor and each Subcontractor shall make such records available at all reasonable hours at a location within this State.

§ 13.7.4 Public Contract Fraud Act. Contractor agrees to comply with and that this Agreement is subject to and governed by the Illinois Public Contract Fraud Act (30 ILCS 545/0.01).

§ 13.7.5 Public Construction Contract Act. Contractor agrees to comply with and that this Agreement is subject to and governed by the Illinois Construction Contract Act (30 ILCS 557/1).

§ 13.7.6 Public Construction Bond Act. Contractor agrees to comply with and that this agreement is subject to and governed by the Illinois Public Construction Bond Act (30 ILCS 550/0.01). If the Contractor furnishes material or labor on the project, or assume any Contracts for material or labor awarded or entered into by the Owner, Contractor first shall supply and deliver to Owner a bond conditioned upon the completion of the Contract, and the payment of such material and labor, as required by the Illinois Public Construction Bond Act. 30 ILCS 550/1 et seq.

§ 13.7.7 Public Works Preference Act. Contractor agrees to comply with and that this agreement is subject to and governed by the Illinois Public Works Preference Act (30 ILCS 560/0.01).

§ 13.7.8 Employment of Illinois Workers on Public Works Act. Contractor agrees to comply with and that that his Agreement is subject to and governed by the Illinois Employment of Illinois Workers on Public Works Act (30 ILCS 570/0.01).

§ 13.7.9 Public Works Contract Change Order Act. Contractor agrees to comply with and that this Agreement is subject to and governed by the Illinois Public Works Contract Change Order Act (50 ILCS 525/1).

§ 13.7.10 Local Government Professional Services Selection Act. Contractor agrees to comply with and that this Agreement is subject to and governed by the Illinois Local Government Professional Services Selection Act (50 ILCS 510/0.01).

§ 13.7.11 Veterans Preference Act. The Contractor agrees to comply with and that this Agreement is subject to and governed by the Illinois Veterans Preference Act (330 ILCS 55/0.01) that, in the employment and appointment to fill positions in the construction, addition to, or alteration of all public works undertaken or contracted for by the State, or by any political subdivision thereof, preference shall be given to persons who have been members of the armed forces of the United States or who, while citizens of the United States, were members of the armed forces of allies of the United States in time of hostilities with a foreign country, and have served under one or more of the following conditions: (1) the veteran served a total of at least 6 months, or (2) the veteran served for the duration of hostilities regardless of the length of engagement, or 3) the veteran served in the theater of operations but was discharged on the basis of a hardship, (4) the veteran was released from active duty basis of a hardship, or because of a service connected disability and was honorably discharged. But such preference shall be given only to those persons who are found to possess the business capacity necessary for the proper discharge of the duties of such employment. No political subdivision or person contracting for such public works is required to give preference to veterans, not residents of such district, over residents thereof, who are not veterans.

§ 13.7.12 As used in this Section: "Time of hostilities with a foreign country" means any period of time in the past, present, or future during which a declaration of war by the United States Congress has been or is in effect or during which an emergency condition has been or is in effect that is recognized by the issuance of a Presidential proclamation or a Presidential executive order and in which the armed forces expeditionary medal or other campaign service medals are awarded according to Presidential executive order.

§ 13.7.12.1 "Armed forces of the United States" means the United States Army, Navy, Air Force, Marine Corps, Coast Guard. Service in the Merchant Marine that constitutes active duty under Section 401 of federal Public Law 95 202 shall also be considered service in the Armed Forces of the United States for purposes of this Section.

§ 13.7.13 Drug Free Workplace. The Contractor certifies by the execution of this Contract that the Contractor will provide a drug free workplace in compliance with the Illinois Drug Free Workplace Act (30 ILCS 580/1 et seq.), including provision of providing notifications, imposing sanctions, providing assistance with counseling, and complying with all other requirements of said Act.

§ 13.7.14 Bid Rigging and Rotating. The Contractor certifies that the Contractor is in compliance with Illinois law and not barred from bidding on the Contract as a result of a conviction for either bid-rigging or bid rotating under Article 33E of the Criminal Code of 1961(720 ILCS 5/33E).

§ 13.7.15 No Smoking. In accordance with the state (105 ILCS 5/10-20.5b) and federal law and Board of Education Policy, smoking is prohibited on all School District property.

§ 13.7.16 Concurrent with the execution of this Contract, the Contractor shall execute the Certificate of Eligibility to enter into public contracts.

§ 13.7.17 The Contractor understands and acknowledges that its Work, in whole or in part, will be performed on public school property where there may be direct, daily contact with school students. The Contractor further understands and acknowledges that the State of Illinois requires that all employees of vendors, licensees, contractors or others having direct, daily contact with students are subject to a criminal background check and may not be listed on the State Sex Offender Registry, the Statewide Sex Offender Database and the Statewide Murderer and Violent Offender against Youth Database. Prior to allowing any of its employees who will be performing the scope of work access to school property, the Contractor agrees to provide the Owner, at the sole cost of the Contractor with the following:

- (1) Evidence that each employee, agent, contractor or other person performing work on school property under this Agreement was subjected to a criminal background check in conformity with 105 ILCS 5/10-21.9; that said persons are not listed on said Registry; and said persons have no criminal convictions for the offenses listed under 105 ILCS 5/10-21.9;
- (2) The Contractor will provide the Owner, upon request, a copy of the criminal background check conducted on each such person.

In the event the Contractor plans to subcontract with or use the services of another person or firm that may have direct, daily contact with students on school property, in order to fulfill its obligations under its Agreement with the Owner then in that event the Contractor will require all such persons or firms to comply with the provisions of this paragraph and 105 ILCS 5/10-21.9.

In the event the Contractor fails to comply with the provisions of this paragraph and 105 ILCS 5/10-21.9, and as a result a suit or claim is instituted by a student for harm caused by an employee of the Contractor, or caused by an employee of a subcontractor to the Contractor, then in that event the Contractor agrees to fully defend and indemnify, including reimbursement of attorney's fees and costs, the Owner against any such claims.

ARTICLE 14 TERMINATION OR SUSPENSION OF THE CONTRACT

§ 14.1 Termination by the Contractor

Intentionally Deleted. .3.

~~§ 14.1.1 The Contractor may terminate the Contract if the Work is stopped for a period of 30 consecutive days through no act or fault of the Contractor, a Subcontractor, a Sub-subcontractor, their agents or employees, or any other persons or entities performing portions of the Work, for any of the following reasons:~~

- ~~.1 Issuance of an order of a court or other public authority having jurisdiction that requires all Work to be stopped;~~
- ~~.2 An act of government, such as a declaration of national emergency, that requires all Work to be stopped;~~
- ~~.3 Because the Architect has not issued a Certificate for Payment and has not notified the Contractor of the reason for withholding certification as provided in Section 9.4.1, or because the Owner has not made payment on a Certificate for Payment within the time stated in the Contract Documents; or~~
- ~~.4 The Owner has failed to furnish to the Contractor reasonable evidence as required by Section 2.2.~~

~~§ 14.1.2 The Contractor may terminate the Contract if, through no act or fault of the Contractor, a Subcontractor, a Sub-subcontractor, their agents or employees, or any other persons or entities performing portions of the Work, repeated suspensions, delays, or interruptions of the entire Work by the Owner as described in Section 14.3, constitute in the aggregate more than 100 percent of the total number of days scheduled for completion, or 120 days in any 365-day period, whichever is less.~~

~~§ 14.1.3 If one of the reasons described in Section 14.1.1 or 14.1.2 exists, the Contractor may, upon seven days' notice to the Owner and Architect, terminate the Contract and recover from the Owner payment for Work executed, as well as reasonable overhead and profit on Work not executed, and costs incurred by reason of such termination.~~

~~§ 14.1.4 If the Work is stopped for a period of 60 consecutive days through no act or fault of the Contractor, a Subcontractor, a Sub-subcontractor, or their agents or employees or any other persons or entities performing portions of the Work because the Owner has repeatedly failed to fulfill the Owner's obligations under the Contract Documents with respect to matters important to the progress of the Work, the Contractor may, upon seven additional days' notice to the Owner and the Architect, terminate the Contract and recover from the Owner as provided in Section 14.1.3.~~

§ 14.2 Termination by the Owner for Cause

~~§ 14.2.1 The Owner may terminate the Contract if the Contractor~~

- ~~.1 repeatedly refuses or fails to supply enough properly skilled workers or proper materials;~~
- ~~.2 fails to make payment to Subcontractors or suppliers in accordance with the respective agreements between the Contractor and the Subcontractors or suppliers;~~
- ~~.3 repeatedly disregards applicable laws, statutes, ordinances, codes, rules and regulations, or lawful orders of a public authority; or~~
- ~~.4 otherwise is guilty of substantial breach of a provision of the Contract Documents.~~If the Contractor shall institute proceedings or consent to proceedings requesting relief or arrangement under the Federal Bankruptcy Act or any similar or applicable federal or state law, or if a petition under any federal or state bankruptcy or insolvency law is filed against the Contractor and such petition is not dismissed within sixty (60) days after the date of said filing, or if the Contractor admits in writing his inability to pay his debts generally as they become due, or if he makes a general assignment for the benefit of his creditors, or if a receiver, liquidator, trustee or assignee is appointed on account of his bankruptcy or insolvency; or if a receiver of all or any substantial portion of the Contractor's properties is appointed;

or if the Contractor abandons the Work; or if he fails, except in cases for which extension of time is provided, to prosecute promptly and diligently the Work or to supply enough properly skilled workmen or proper materials for the Work; or if he submits an Application for Payment, sworn statement, waiver of lien, affidavit or document of any nature whatsoever which is intentionally falsified; or if he fails to make prompt payment to Subcontractors or for materials or labor or otherwise breaches his obligations under any subcontract with a Subcontractor; or if a mechanic's or material man's lien or notice of lien is filed against any part of the Work or the site of the Project and not promptly bonded or insured over by the Contractor in a manner satisfactory to the Owner; or if the Contractor disregards any laws, statutes, ordinances, rules, regulations or orders of any governmental body or public or quasi-public authority having jurisdiction of the Work or the site of the Project; or if he otherwise violates any provision of the Contract Documents; then the Owner, without prejudice to any right or remedy available to the Owner under the Contract Documents or at law or in equity, the Owner may, after giving the Contractor and the surety under the Performance Bond and under the Labor and Material Payment Bond in Exhibit A, seven (7) days' written notice, terminate the employment of the Contractor. If requested by the Owner, the Contractor shall remove any part or all of his equipment, machinery and supplies from the site of the Project within seven (7) days after the date of such request, and in the event of the Contractor's failure to do so, the Owner shall have the right to remove or store such equipment, machinery and supplies at the Contractor's expense. In case of such termination, the Contractor shall not be entitled to receive any further payment for Work performed by the Contractor through the date of termination. The Owner's right to terminate the Owner-Contractor Agreement pursuant to this Section 14.2.1 shall be in addition to and not in limitation of any rights or remedies existing hereunder or pursuant hereto or at law or in equity.

§ 14.2.2 When any of the reasons described in Section 14.2.1 exist, and upon certification by the Architect that sufficient cause exists to justify such action, the Owner may, without prejudice to any other rights or remedies of the Owner and after giving the Contractor and the Contractor's surety, if any, seven days' notice, terminate employment of the Contractor and may, subject to any prior rights of the surety:

- .1 Exclude the Contractor from the site and take possession of all materials, equipment, tools, and construction equipment and machinery thereon owned by the Contractor;
- .2 Accept assignment of subcontracts pursuant to Section 5.4; and
- .3 Finish the Work by whatever reasonable method the Owner may deem expedient. Upon written request of the Contractor, the Owner shall furnish to the Contractor a detailed accounting of the costs incurred by the Owner in finishing the Work.

§ 14.2.3 When the Owner terminates the Contract for one of the reasons stated in Section 14.2.1, the Contractor shall not be entitled to receive further payment until the Work is finished.

§ 14.2.4 ~~If the unpaid balance of the Contract Sum exceeds costs of finishing the Work, including compensation for the Architect's services and expenses made necessary thereby, and other damages incurred by the Owner and not expressly waived, such excess shall be paid to the Contractor. If such costs and damages exceed the all costs to the Owner of completing the Work, then the Contractor shall be paid for all Work performed by the Contractor to the date of termination. If such costs to the Owner of completing the Work exceed such unpaid balance, the Contractor shall pay the difference to the Owner. The amount the Owner immediately upon the Owner's demand. The costs to the Owner of completing the Work shall include, but not be limited to, the cost of any additional architectural, managerial and administrative services required thereby, any costs incurred in retaining another contractor or other subcontracts, any additional interest or fees which the Owner must pay by reason of a delay in the completion of the Work, attorneys' fees and expenses, and any other damages, costs, and expenses the Owner may incur by reason of completing the Work or any delay thereof. . The amount, if any, to be paid to the Contractor or Owner, as the case may be, shall be certified by the Initial Decision Maker, upon application, shall be certified by the Architect, upon application, in the manner provided in Section 9.4, and this obligation for payment shall survive termination of the Contract.~~

§ 14.3 Suspension by the Owner for Convenience

§ 14.3.1 The Owner may, without cause, order the Contractor in writing to suspend, delay or interrupt the Work, in whole or in part for such period of time as the Owner may determine.

§ 14.3.2 The Contract Sum and Contract Time shall be adjusted for increases in the cost and time caused by suspension, delay, or interruption under Section 14.3.1. Adjustment of the Contract Sum shall include profit. No adjustment shall be made to the extent

- .1 that performance is, was, or would have been, so suspended, delayed, or interrupted, by another cause for which the Contractor is responsible; or
- .2 that an equitable adjustment is made or denied under another provision of the Contract.

§ 14.4 Termination by the Owner for Convenience

§ 14.4.1 The Owner may, at any time, terminate the Contract for the Owner's convenience and without cause upon seven (7) days written notice to the Contractor, terminate the Agreement between the Owner and Contractor without cause. Upon written request and submittal of the appropriate documentation as required by the Owner, the Owner shall pay the Contractor for all work performed by the Contractor to the date of termination that has been approved by the Owner. The Owner may, upon the Contractor executing such a confirmatory assignments as the Owner shall request, accept and assume all of the Contractor's obligations under all subcontracts executed in accordance with the terms of the Contract Documents that may accrue after the date of such termination and that the Contractor has incurred in good faith in connection with the Work. Upon receipt of notice of termination, the Contractor shall cease all operations on the date specified by the Owner, terminate subcontracts not assumed by the Owner, make no further orders of materials or equipment, complete work not terminated (if any), and provide such reports as may be requested by the Owner and the Architect as to the status of the Work and the Work remaining to be completed. The Owner's right to terminate the Contract under this Section shall be in addition to, and not in limitation of, its rights to stop the Work without terminating the Contract.

§ 14.4.2 Upon receipt of notice from the Owner of such termination for the Owner's convenience, the Contractor shall

- .1 cease operations as directed by the Owner in the notice;
- .2 take actions necessary, or that the Owner may direct, for the protection and preservation of the Work; and
- .3 except for Work directed to be performed prior to the effective date of termination stated in the notice, terminate all existing subcontracts and purchase orders and enter into no further subcontracts and purchase orders.

§ 14.4.3 In case of such termination for the Owner's convenience, the Owner shall pay the Contractor for Work properly executed; costs incurred by reason of the termination, including costs attributable to termination of Subcontracts; and the termination fee, if any, set forth in the Agreement.

ARTICLE 15 CLAIMS AND DISPUTES

§ 15.1 Claims

§ 15.1.1 Definition

A Claim is a demand or assertion by one of the parties to the Contract seeking, as a matter of right, payment of money, a change in the Contract Time, or other relief with respect to the terms of the Contract. The term "Claim" also includes other disputes and matters in question between the Owner and Contractor arising out of or relating to the Contract. The responsibility to substantiate Claims shall rest with the party making the Claim. This Section 15.1.1 does not require the Owner to file a Claim in order to impose liquidated damages in accordance with the Contract Documents.

§ 15.1.2 Time Limits on Claims

The Owner and Contractor shall commence all Claims and causes of action against the other and arising out of or related to the Contract, whether in contract, tort, breach of warranty or otherwise, in accordance with the requirements of the binding dispute resolution method selected in the Agreement and within the period specified by applicable law, but in any case not more than 10 years after the date of Substantial Completion of the Work. The Owner and Contractor waive all Claims and causes of action not commenced in accordance with this Section 15.1.2.

§ 15.1.3 Notice of Claims

§ 15.1.3.1 Claims by either the Owner or Contractor, where the condition giving rise to the Claim is first discovered prior to expiration of the period for correction of the Work set forth in Section 12.2.2, shall be initiated by notice to the other party and to the Initial Decision Maker with a copy sent to the Architect, if the Architect is not serving as the Initial Decision Maker. Claims by either party under this Section 15.1.3.1 shall be initiated within 21 days after

occurrence of the event giving rise to such Claim or within 21 days after the claimant first recognizes the condition giving rise to the Claim, whichever is later.

§ 15.1.3.2 Claims by either the Owner or Contractor, where the condition giving rise to the Claim is first discovered after expiration of the period for correction of the Work set forth in Section 12.2.2, shall be initiated by notice to the other party. In such event, no decision by the Initial Decision Maker is required.

§ 15.1.4 Continuing Contract Performance

§ 15.1.4.1 Pending final resolution of a Claim, except as otherwise agreed in writing or as provided in Section 9.7 and Article 14, the Contractor shall proceed diligently with performance of the Contract and the Owner shall continue to make payments in accordance with the Contract Documents.

§ 15.1.4.2 The Contract Sum and Contract Time shall be adjusted in accordance with the Initial Decision Maker's decision, subject to the right of either party to proceed in accordance with this Article 15. The Architect will issue Certificates for Payment in accordance with the decision of the Initial Decision Maker.

§ 15.1.5 Claims for Additional Cost

If the Contractor wishes to make a Claim for an increase in the Contract Sum, notice as provided in Section 15.1.3 shall be given before proceeding to execute the portion of the Work that is the subject of the Claim. Prior notice is not required for Claims relating to an emergency endangering life or property arising under Section 10.4.

§ 15.1.6 Claims for Additional Time

§ 15.1.6.1 If the Contractor wishes to make a Claim for an increase in the Contract Time, notice as provided in Section 15.1.3 shall be ~~given. The Contractor's Claim given within seven (7) calendar days after the event giving rise to the claim for additional time. The Contractor's claim~~ shall include an estimate of cost and of probable effect of delay on progress of the Work. In the case of a continuing delay, only one ~~Claim-claim~~ is necessary.

§ 15.1.6.2 If adverse weather conditions are the basis for a Claim for additional time, such Claim shall be documented by data substantiating that weather conditions were abnormal for the period of time, could not have been reasonably anticipated, and had an adverse effect on the scheduled construction.

§ 15.1.7 Waiver of Claims for Consequential Damages

The Contractor ~~and Owner waive Claims against each other~~ ~~waives Claims against the Owner and Architect~~ for consequential damages arising out of or relating to this Contract. This ~~mutual~~ waiver includes

- ~~1 damages incurred by the Owner for rental expenses, for losses of use, income, profit, financing, business and reputation, and for loss of management or employee productivity or of the services of such persons; and~~
- ~~2 damages incurred by the Contractor for principal office expenses including the compensation of personnel stationed there, for losses of financing, business and reputation, and for loss of profit, except anticipated profit arising directly from the Work.~~

This ~~mutual~~ waiver is applicable, without limitation, to all consequential damages due to either party's termination in accordance with Article 14. Nothing contained in this Section 15.1.7 shall be deemed to preclude assessment of liquidated damages, when applicable, in accordance with the requirements of the Contract Documents.

§ 15.2 Initial Decision

§ 15.2.1 Claims, excluding those where the condition giving rise to the Claim is first discovered after expiration of the period for correction of the Work set forth in Section 12.2.2 or arising under Sections 10.3, 10.4, and 11.5, shall be referred to the Initial Decision Maker for initial decision. The Architect will serve as the Initial Decision Maker, unless otherwise indicated in the ~~Agreement. Except for those Claims excluded by this Section 15.2.1, an initial decision shall be required as a condition precedent to mediation of any Claim. If an initial decision has not been rendered within 30 days after the Claim has been referred to the Initial Decision Maker, the party asserting the Claim may demand mediation and binding dispute resolution without a decision having been rendered.~~ ~~Agreement.~~ Unless the Initial Decision Maker and all affected parties agree, the Initial Decision Maker will not decide disputes between the Contractor and persons or entities other than the Owner.

§ 15.2.2 The Initial Decision Maker will review Claims and within ten days of the receipt of a Claim take one or more of the following actions: (1) request additional supporting data from the claimant or a response with supporting data from the other party, (2) reject the Claim in whole or in part, (3) approve the Claim, (4) suggest a compromise, or (5) advise the parties that the Initial Decision Maker is unable to resolve the Claim if the Initial Decision Maker lacks sufficient information to evaluate the merits of the Claim or if the Initial Decision Maker concludes that, in the Initial Decision Maker's sole discretion, it would be inappropriate for the Initial Decision Maker to resolve the Claim.

§ 15.2.3 In evaluating Claims, the Initial Decision Maker may, but shall not be obligated to, consult with or seek information from either party or from persons with special knowledge or expertise who may assist the Initial Decision Maker in rendering a decision. ~~The Initial Decision Maker may request the Owner to authorize retention of such persons at the Owner's expense.~~

§ 15.2.4 If the Initial Decision Maker requests a party to provide a response to a Claim or to furnish additional supporting data, such party shall respond, within ten days after receipt of the request, and shall either (1) provide a response on the requested supporting data, (2) advise the Initial Decision Maker when the response or supporting data will be furnished, or (3) advise the Initial Decision Maker that no supporting data will be furnished. Upon receipt of the response or supporting data, if any, the Initial Decision Maker will either reject or approve the Claim in whole or in part.

§ 15.2.5 The Initial Decision Maker will render an initial decision approving or rejecting the Claim, or indicating that the Initial Decision Maker is unable to resolve the Claim. This initial decision shall (1) be in writing; (2) state the reasons therefor; and (3) notify the parties and the Architect, if the Architect is not serving as the Initial Decision Maker, of any change in the Contract Sum or Contract Time or both. The initial decision shall be final and binding on the parties ~~but subject to mediation and, if the parties fail to resolve their dispute through mediation, to binding dispute resolution subject to litigation.~~

§ 15.2.6 ~~Either party may file for mediation of an initial decision at any time, subject to the terms of Section 15.2.6.1. Intentionally Deleted.~~

~~§ 15.2.6.1 Either party may, within 30 days from the date of receipt of an initial decision, demand in writing that the other party file for mediation. If such a demand is made and the party receiving the demand fails to file for mediation within 30 days after receipt thereof, then both parties waive their rights to mediate or pursue binding dispute resolution proceedings with respect to the initial decision.~~

§ 15.2.7 In the event of a Claim against the Contractor, the Owner may, but is not obligated to, notify the surety, if any, of the nature and amount of the Claim. If the Claim relates to a possibility of a Contractor's default, the Owner may, but is not obligated to, notify the surety and request the surety's assistance in resolving the controversy.

§ 15.2.8 If a Claim relates to or is the subject of a mechanic's lien, the party asserting such Claim may proceed in accordance with applicable law to comply with the lien notice or filing deadlines.

§ 15.3 Mediation

~~§ 15.3.1 Claims, disputes, or other matters in controversy arising out of or related to the Contract, except those waived as provided for in Sections 9.10.4, 9.10.5, and 15.1.7, shall be subject to mediation as a condition precedent to binding dispute resolution.~~

~~§ 15.3.2 The parties shall endeavor to resolve their Claims by mediation which, unless the parties mutually agree otherwise, shall be administered by the American Arbitration Association in accordance with its Construction Industry Mediation Procedures in effect on the date of the Agreement. A request for mediation shall be made in writing, delivered to the other party to the Contract, and filed with the person or entity administering the mediation. The request may be made concurrently with the filing of binding dispute resolution proceedings but, in such event, mediation shall proceed in advance of binding dispute resolution proceedings, which shall be stayed pending mediation for a period of 60 days from the date of filing, unless stayed for a longer period by agreement of the parties or court order. If an arbitration is stayed pursuant to this Section 15.3.2, the parties may nonetheless proceed to the selection of the arbitrator(s) and agree upon a schedule for later proceedings.~~

~~§ 15.3.3~~ Either party may, within 30 days from the date that mediation has been concluded without resolution of the dispute or 60 days after mediation has been demanded without resolution of the dispute, demand in writing that the other party file for binding dispute resolution. If such a demand is made and the party receiving the demand fails to file for binding dispute resolution within 60 days after receipt thereof, then both parties waive their rights to binding dispute resolution proceedings with respect to the initial decision.

~~§ 15.3.4~~ The parties shall share the mediator's fee and any filing fees equally. The mediation shall be held in the place where the Project is located, unless another location is mutually agreed upon. Agreements reached in mediation shall be enforceable as settlement agreements in any court having jurisdiction thereof.

~~§ 15.4 Arbitration~~

~~§ 15.4.1~~ If the parties have selected arbitration as the method for binding dispute resolution in the Agreement, any Claim subject to, but not resolved by, mediation shall be subject to arbitration which, unless the parties mutually agree otherwise, shall be administered by the American Arbitration Association in accordance with its Construction Industry Arbitration Rules in effect on the date of the Agreement. The Arbitration shall be conducted in the place where the Project is located, unless another location is mutually agreed upon. A demand for arbitration shall be made in writing, delivered to the other party to the Contract, and filed with the person or entity administering the arbitration. The party filing a notice of demand for arbitration must assert in the demand all Claims then known to that party on which arbitration is permitted to be demanded.

~~§ 15.4.1.1~~ A demand for arbitration shall be made no earlier than concurrently with the filing of a request for mediation, but in no event shall it be made after the date when the institution of legal or equitable proceedings based on the Claim would be barred by the applicable statute of limitations. For statute of limitations purposes, receipt of a written demand for arbitration by the person or entity administering the arbitration shall constitute the institution of legal or equitable proceedings based on the Claim.

~~§ 15.4.2~~ The award rendered by the arbitrator or arbitrators shall be final, and judgment may be entered upon it in accordance with applicable law in any court having jurisdiction thereof.

~~§ 15.4.3~~ The foregoing agreement to arbitrate and other agreements to arbitrate with an additional person or entity duly consented to by parties to the Agreement, shall be specifically enforceable under applicable law in any court having jurisdiction thereof.

~~§ 15.4.4 Consolidation or Joinder~~

~~§ 15.4.4.1~~ Subject to the rules of the American Arbitration Association or other applicable arbitration rules, either party may consolidate an arbitration conducted under this Agreement with any other arbitration to which it is a party provided that (1) the arbitration agreement governing the other arbitration permits consolidation, (2) the arbitrations to be consolidated substantially involve common questions of law or fact, and (3) the arbitrations employ materially similar procedural rules and methods for selecting arbitrator(s).

~~§ 15.4.4.2~~ Subject to the rules of the American Arbitration Association or other applicable arbitration rules, either party may include by joinder persons or entities substantially involved in a common question of law or fact whose presence is required if complete relief is to be accorded in arbitration, provided that the party sought to be joined consents in writing to such joinder. Consent to arbitration involving an additional person or entity shall not constitute consent to arbitration of any claim, dispute or other matter in question not described in the written consent.

ARTICLE 16 LIMIT TO AVOID INCORPORATION OF RESPONSIBILITY BY REFERENCE

§ 16.1 Where any specification which is incorporated herein by reference, through the words "and/or as directed by the Architect," or phrases having a similar effect appear to give the Architect the right to direct something other than that specified, the Architect has in fact no such right to except as it may be established in specific instances in portions of this Instruments of Service other than in said specifications.

ARTICLE 17 INCORPORATION OF CONTRACT TERMS WITH SUBCONTRACTORS

§ 17.1 Contractor agrees that s/he will be responsible to incorporate all of the terms and conditions herein, including all amendments to this Contract, with any and all of the Subcontractors as well as any Subcontractors retained by Subcontractors. Contractor acknowledges that it is the Owner’s intent that all of the terms and conditions herein, including all amendments to this Contract, will be adhered to by the Contractor and all Subcontractors performing any Work in this project.

~~§ 15.4.4.3 The Owner and Contractor grant to any person or entity made a party to an arbitration conducted under this Section 15.4, whether by joinder or consolidation, the same rights of joinder and consolidation as those of the Owner and Contractor under this Agreement.~~



DRAFT AIA® Document A101™ - 2017

Exhibit A

Insurance and Bonds

This Insurance and Bonds Exhibit is part of the Agreement, between the Owner and the Contractor, dated the <> day of <> in the year <>
(In words, indicate day, month and year.)

for the following PROJECT:
(Name and location or address)

< Kirby School District 140 - General >
<REVISED 020419 >

THE OWNER:
(Name, legal status and address)

<Board of Education - Kirby School District 140>< >
<16931 South Grissom Drive
Tinley Park, Illinois 60477 >

THE CONTRACTOR:
(Name, legal status and address)

< >< >
< >

TABLE OF ARTICLES

- A.1 GENERAL
- A.2 OWNER'S INSURANCE
- A.3 CONTRACTOR'S INSURANCE AND BONDS
- A.4 SPECIAL TERMS AND CONDITIONS

ARTICLE A.1 GENERAL

The Owner and Contractor shall purchase and maintain insurance, and provide bonds, as set forth in this ~~Exhibit.~~ Exhibit from companies lawfully authorized to do business in the jurisdiction in which the Project is located. As used in this Exhibit, the term General Conditions refers to AIA Document A201™-2017, General Conditions of the Contract for Construction.

ARTICLE A.2 OWNER'S INSURANCE

§ A.2.1 General

Prior to commencement of the Work, the Owner shall secure the insurance, and provide evidence of the coverage, required under this Article A.2 and, upon the Contractor's request, provide a copy of the property insurance policy or policies required by Section A.2.3. The copy of the policy or policies provided shall contain all applicable conditions, definitions, exclusions, and endorsements.

ADDITIONS AND DELETIONS:

The author of this document has added information needed for its completion. The author may also have revised the text of the original AIA standard form. An *Additions and Deletions Report* that notes added information as well as revisions to the standard form text is available from the author and should be reviewed.

This document has important legal consequences. Consultation with an attorney is encouraged with respect to its completion or modification.

This document is intended to be used in conjunction with AIA Document A201™-2017, General Conditions of the Contract for Construction. Article 11 of A201™-2017 contains additional insurance provisions.

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§ A.2.2 Liability Insurance

The Owner shall be responsible for purchasing and maintaining the Owner’s usual general liability insurance.

§ A.2.3 Required Property Insurance

§ A.2.3.1 Unless this obligation is placed on the Contractor pursuant to Section A.3.3.2.1, the Owner shall purchase and maintain, from an insurance company or insurance companies lawfully authorized to issue insurance in the jurisdiction where the Project is located, property insurance written on a builder’s risk "all-risks" completed value or equivalent policy form and sufficient to cover the total value of the entire Project on a replacement cost basis. The Owner’s property insurance coverage shall be no less than the amount of the initial Contract Sum, plus the value of subsequent Modifications and labor performed and materials or equipment supplied by others. The property insurance shall be maintained until Substantial Completion and thereafter as provided in Section A.2.3.1.3, unless otherwise provided in the Contract Documents or otherwise agreed in writing by the parties to this Agreement. This insurance shall include the interests of the Owner, Contractor, Subcontractors, and Sub-subcontractors in the Project as insureds. ~~This insurance shall include the interests of mortgagees as loss payees. The policy shall be based on a \$5,000 deductible, applicable to all losses for each occurrence. The Contractor shall be solely response for any and all losses up to \$5,000 per loss. Losses are payable to the Owner for Owner’s own account.~~

§ A.2.3.1.1 Causes of Loss. The insurance required by this Section A.2.3.1 shall provide coverage for direct physical loss or damage, and shall not exclude the risks of fire, explosion, theft, vandalism, malicious mischief, collapse, earthquake, flood, ~~or windstorm, and debris removal including demolition occasioned by enforcement of any legal requirements, or windstorm and shall cover reasonable compensation for Architect’s and Contractor’s services and expenses required as a result of an insured loss.~~ The insurance shall also provide coverage for ensuing loss or resulting damage from error, omission, or deficiency in construction methods, design, specifications, workmanship, or materials. Sub-limits, if any, are as follows:
(Indicate below the cause of loss and any applicable sub-limit.)

Causes of Loss	Sub-Limit

§ A.2.3.1.2 Specific Required Coverages. The insurance required by this Section A.2.3.1 shall provide coverage for loss or damage to falsework and other temporary structures, and to building systems from testing and startup. The insurance shall also cover debris removal, including demolition occasioned by enforcement of any applicable legal requirements, and reasonable compensation for the Architect’s and Contractor’s services and expenses required as a result of such insured loss, including claim preparation expenses. Sub-limits, if any, are as follows:
(Indicate below type of coverage and any applicable sub-limit for specific required coverages.)

Coverage	Sub-Limit

§ A.2.3.1.2.1 Coverage shall not extend to:

- A. ~~The Contractors’, Subcontractors’, or the Architect’s/Engineer’s Tools, apparatus, machinery, scaffolding, hoists, forms, staging, shoring and other similar items commonly referred to as construction equipment, which may be on the site and the capital value of which is not included in the Work.~~
- B. ~~Property owned by employees of any of the foregoing.~~
- C. ~~Vehicles of any kind.~~
- D. ~~Trees and shrubs.~~
- E. ~~Drawings and specifications.~~

§ A.2.3.1.2.2 ~~The policy by its terms or endorsement shall specifically permit and allow for beneficial or partial occupancy prior to completion or acceptance of the project by the Owner.~~

§ A.2.3.1.2.3 ~~The prompt repair or reconstruction of the Work as a result of any insured loss or damage shall be the Contractor’s responsibility and shall be accomplished at no additional cost to the Owner or Architect. The Contractor shall furnish proper assistance in the adjustment and settlement of any loss. Loss will be adjustable with and payable to the party purchasing the property insurance. The policy shall contain a provision that the policy will~~

not be canceled, changed or altered until at least thirty (30) calendar days prior written notice has been given to the named insured.

§ A.2.3.1.3 Unless the parties agree otherwise, upon Substantial Completion, the Owner shall continue the insurance required by Section A.2.3.1 or, if necessary, replace the insurance policy required under Section A.2.3.1 with property insurance written for the total value of the Project that shall remain in effect until expiration of the period for correction of the Work set forth in Section 12.2.2 of the General Conditions.

§ A.2.3.1.4 ~~Deductibles and Self-Insured Retentions. If the insurance required by this Section A.2.3 is subject to deductibles or self-insured retentions, the Owner shall be responsible for all loss not covered because of such deductibles or retentions.~~ Retentions. The policy shall be based on a \$5,000 deductible, applicable to all losses for each occurrence. The Contractor shall be solely responsible for any and all losses up to \$5,000 per loss. Losses are payable to the Owner for Owner's own account.

§ A.2.3.2 ~~Occupancy or Use Prior to Substantial Completion. The Owner's occupancy or use of any completed or partially completed portion of the Work prior to Substantial Completion shall not commence until the insurance company or companies providing the insurance under Section A.2.3.1 have consented in writing to the continuance of coverage. The Owner and the Contractor shall take no action with respect to partial occupancy or use that would cause cancellation, lapse, or reduction of insurance, unless they agree otherwise in writing.~~ policy by its terms or endorsement shall specifically permit and allow for beneficial or partial occupancy prior to completion or acceptance of the Project by the Owner.

§ A.2.3.3 Insurance for Existing Structures

If the Work involves remodeling an existing structure or constructing an addition to an existing structure, the Owner shall purchase and maintain, until the expiration of the period for correction of Work as set forth in Section 12.2.2 of the General Conditions, "all-risks" property insurance, on a replacement cost basis, protecting the existing structure against direct physical loss or damage from the causes of loss identified in Section A.2.3.1, notwithstanding the undertaking of the Work. The Owner shall be responsible for all co-insurance penalties.

§ A.2.4 Optional Extended Property Insurance.

The Owner ~~shall~~ may purchase and maintain the insurance selected and described below.

(Select the types of insurance the Owner is required to purchase and maintain by placing an X in the box(es) next to the description(s) of selected insurance. For each type of insurance selected, indicate applicable limits of coverage or other conditions in the fill point below the selected item.)

[] § A.2.4.1 Loss of Use, Business Interruption, and Delay in Completion Insurance, to reimburse the Owner for loss of use of the Owner's property, or the inability to conduct normal operations due to a covered cause of loss.

[] § A.2.4.2 Ordinance or Law Insurance, for the reasonable and necessary costs to satisfy the minimum requirements of the enforcement of any law or ordinance regulating the demolition, construction, repair, replacement or use of the Project.

[] § A.2.4.3 Expediting Cost Insurance, for the reasonable and necessary costs for the temporary repair of damage to insured property, and to expedite the permanent repair or replacement of the damaged property.

§ A.2.4.4 Extra Expense Insurance, to provide reimbursement of the reasonable and necessary excess costs incurred during the period of restoration or repair of the damaged property that are over and above the total costs that would normally have been incurred during the same period of time had no loss or damage occurred.

§ A.2.4.5 Civil Authority Insurance, for losses or costs arising from an order of a civil authority prohibiting access to the Project, provided such order is the direct result of physical damage covered under the required property insurance.

§ A.2.4.6 Ingress/Egress Insurance, for loss due to the necessary interruption of the insured's business due to physical prevention of ingress to, or egress from, the Project as a direct result of physical damage.

§ A.2.4.7 Soft Costs Insurance, to reimburse the Owner for costs due to the delay of completion of the Work, arising out of physical loss or damage covered by the required property insurance: including construction loan fees; leasing and marketing expenses; additional fees, including those of architects, engineers, consultants, attorneys and accountants, needed for the completion of the construction, repairs, or reconstruction; and carrying costs such as property taxes, building permits, additional interest on loans, realty taxes, and insurance premiums over and above normal expenses.

§ A.2.5 Other Optional Insurance.

The Owner shall purchase and maintain the insurance selected below.

(Select the types of insurance the Owner is required to purchase and maintain by placing an X in the box(es) next to the description(s) of selected insurance.)

~~§ A.2.5.1 Cyber Security Insurance for loss to the Owner due to data security and privacy breach, including costs of investigating a potential or actual breach of confidential or private information. *(Indicate applicable limits of coverage or other conditions in the fill point below.)*~~

~~§ A.2.5.2 Other Insurance *(List below any other insurance coverage to be provided by the Owner and any applicable limits.)*~~

Coverage

Limits

ARTICLE A.3 CONTRACTOR'S INSURANCE AND BONDS

§ A.3.1 General

§ A.3.1.1 Certificates of Insurance. The Contractor shall provide certificates of insurance acceptable to the Owner evidencing compliance with the requirements in this Article A.3 at the following times: (1) prior to commencement of the Work; (2) upon renewal or replacement of each required policy of insurance; and (3) upon the Owner's written request. An additional certificate evidencing continuation of commercial liability coverage, including coverage for completed operations, shall be submitted with the final Application for Payment and thereafter upon renewal or replacement of such coverage until the expiration of the periods required by Section A.3.2.1 and Section

A.3.3.1. The certificates will show the Owner as an additional insured on the Contractor's Commercial General Liability and excess or umbrella liability policy or policies.

§ A.3.1.2 Deductibles and Self-Insured Retentions. The Contractor shall disclose to the Owner any deductible or self-insured retentions applicable to any insurance required to be provided by the Contractor.

§ A.3.1.3 Additional Insured Obligations. To the fullest extent permitted by law, the Contractor shall cause the commercial general liability coverage to include (1) the Owner, the Architect, and the Architect's consultants as additional insureds for claims caused in whole or in part by the Contractor's negligent acts or omissions during the Contractor's operations; and (2) the Owner as an additional insured for claims caused in whole or in part by the Contractor's negligent acts or omissions for which loss occurs during completed operations. The additional insured coverage shall be primary and non-contributory to any of the Owner's general liability insurance policies and shall apply to both ongoing and completed operations. To the extent commercially available, the additional insured coverage shall be no less than that provided by Insurance Services Office, Inc. (ISO) forms CG 20 10 07 04, CG 20 37 07 04, and, with respect to the Architect and the Architect's consultants, CG 20 32 07 04. The Contractor shall also cause the automobile liability policy to include the Owner, the Architect and the Architect's consultants as additional insureds.

§ A.3.2 Contractor's Required Insurance Coverage

§ A.3.2.1 The Contractor shall purchase and maintain the following types and limits of insurance from an insurance company or insurance companies lawfully authorized to issue insurance in the jurisdiction where the Project is located. The Contractor shall maintain the required insurance until the expiration of the period for correction of Work as set forth in Section 12.2.2 of the General Conditions, unless a different duration is stated below: *(If the Contractor is required to maintain insurance for a duration other than the expiration of the period for correction of Work, state the duration.)*

«Coverages shall be maintained without interruption from date of commencement of the Work until 60 days after the date of Final Completion or for such other period for maintenance of completed operations coverage as specified in the Contract Documents. With respect to the Contractor's completed operations coverage, coverage shall be maintained until expiration of the period for correction of Work or for such other period for maintenance of completed operations coverage as specified in the Contract Documents.»

§ A.3.2.2 Commercial General Liability

§ A.3.2.2.1 Commercial General Liability insurance for the Project written on an occurrence form with policy limits of not less than «One Million Dollars » (\$ «1,000,000 ») each occurrence, «Two Million Dollars » (\$ «2,000,000 ») general aggregate, and «One Million Dollars » (\$ «1,000,000 ») aggregate for products-completed operations hazard, providing coverage for claims including

- .1 damages because of bodily injury, sickness or disease, including occupational sickness or disease, and death of any person;
- .2 personal injury and advertising injury;
- .3 damages because of physical damage to or destruction of tangible property, including the loss of use of such property;
- .4 bodily injury or property damage arising out of completed operations; and
- .5 the Contractor's indemnity obligations under Section 3.18 of the General Conditions.

.6 Liability insurance should be written on the comprehensive general liability basis, and shall include, but not be limited to the following sub-lines:

- A. Premises and Operations including X, C, U coverages (explosion, collapse, underground).
- B. Products and Completed Operations to be maintained for two (2) years after Final Completion.
- C. Independent Contractor's Protective.
- D. Broad Form Comprehensive General Liability Endorsement:
 1. Contractual Liability, including contractors' obligation under Section 3.18.
 2. Personal Injury & Advertising Injury Liability
 3. Premises Medical Payments
 4. Fire Legal Liability - Real Property

5. Broad Form Property Damage Liability (including Completed Operations)
6. Incidental Medical Malpractice Liability
7. Additional Persons Insured, including employees for personal and advertising injury.
8. Extended Bodily Injury Liability
- .10 If liability insurance is written under the new simplified form - Commercial General Liability, the above listed coverages should be included.
- .11 If the General Liability coverages are provided by a Commercial General Liability Policy on a claims-made basis, the policy date or retroactive date shall predate the contract; the termination date of the policy shall be no earlier than the termination date of coverages required to be maintained after final payment, certified in accordance with Section 9.10.2, and an extended period endorsement "Supplemental Tail," must be purchased.
- .12 In any and all claims against the Owner or the Architect, or any of their officers, directors, board members, officials, agents or employees, by any employee or Contractor, any subcontractor, anyone directly or indirectly employed by any of them, or anyone for whose acts any of them may be liable, the insurance obligation under this Section shall not be limited in any way by any limitation on the amount or type of damages, compensation, or benefits payable by or for the Contractor or subcontractor under the Worker's Compensation Act, disability benefit acts or other employees benefits acts.

§ A.3.2.2.2 The Contractor's Commercial General Liability policy under this Section A.3.2.2 shall not contain an exclusion or restriction of coverage for the following:

- .1 Claims by one insured against another insured, if the exclusion or restriction is based solely on the fact that the claimant is an insured, and there would otherwise be coverage for the claim.
- .2 Claims for property damage to the Contractor's Work arising out of the products-completed operations hazard where the damaged Work or the Work out of which the damage arises was performed by a Subcontractor.
- .3 Claims for bodily injury other than to employees of the insured.
- .4 Claims for indemnity under Section 3.18 of the General Conditions arising out of injury to employees of the insured.
- .5 Claims or loss excluded under a prior work endorsement or other similar exclusionary language.
- .6 Claims or loss due to physical damage under a prior injury endorsement or similar exclusionary language.
- .7 Claims related to residential, multi-family, or other habitational projects, if the Work is to be performed on such a project.
- .8 Claims related to roofing, if the Work involves roofing.
- .9 Claims related to exterior insulation finish systems (EIFS), synthetic stucco or similar exterior coatings or surfaces, if the Work involves such coatings or surfaces.
- .10 Claims related to earth subsidence or movement, where the Work involves such hazards.
- .11 Claims related to explosion, collapse and underground hazards, where the Work involves such hazards.

§ A.3.2.3 Automobile Liability covering vehicles owned, and non-owned vehicles used, by the Contractor, with policy limits of not less than «One Million Dollars» (\$ «1,000,000») per accident, for bodily injury, death of any person, and property damage arising out of the ownership, maintenance and use of those motor vehicles along with any other statutorily required automobile coverage.

~~§ A.3.2.4 The Contractor may achieve the required limits and coverage for Commercial General Liability and Automobile Liability through a combination of primary and excess or umbrella liability insurance, provided such primary and excess or umbrella insurance policies result in the same or greater coverage as the coverages required under Section A.3.2.2 and A.3.2.3, and in no event shall any excess or umbrella liability insurance provide narrower coverage than the primary policy. The excess policy shall not require the exhaustion of the underlying limits only through the actual payment by the underlying insurers. Umbrella Excess Liability insurance in the amount of Two Million Dollars (\$2,000,000) over commercial general liability insurance, automobile liability insurance and Employer's Liability insurance.~~

§ A.3.2.5 Workers' Compensation at statutory limits.

§ A.3.2.6 Employers' Liability with policy limits not less than «One Million Dollars» (\$ «1,000,000») each accident, «One Million Dollars» (\$ «1,000,000») each employee, and «One Million Dollars» (\$ «1,000,000») policy limit.

§ A.3.2.7 Jones Act, and the Longshore & Harbor Workers' Compensation Act, as required, if the Work involves hazards arising from work on or near navigable waterways, including vessels and docks

§ A.3.2.8 If the Contractor is required to furnish professional services as part of the Work, the Contractor shall procure Professional Liability insurance covering performance of the professional services, with policy limits of not less than «One Million Dollars» (\$ «1,000,000») per claim and «One Million Dollars» (\$ «1,000,000») in the aggregate.

§ A.3.2.9 If the Work involves the transport, dissemination, use, or release of pollutants, the Contractor shall procure Pollution Liability insurance, with policy limits of not less than «One Million Dollars» (\$ «1,000,000») per claim and «One Million Dollars» (\$ «1,000,000») in the aggregate.

~~§ A.3.2.10 Coverage under Sections A.3.2.8 and A.3.2.9 may be procured through a Combined Professional Liability and Pollution Liability insurance policy, with combined policy limits of not less than «\$» per claim and «\$» in the aggregate.~~

~~§ A.3.2.11 Insurance for maritime liability risks associated with the operation of a vessel, if the Work requires such activities, with policy limits of not less than «\$» per claim and «\$» in the aggregate.~~

~~§ A.3.2.12 Insurance for the use or operation of manned or unmanned aircraft, if the Work requires such activities, with policy limits of not less than «\$» per claim and «\$» in the aggregate.~~

§ A.3.3 Contractor's Other Insurance Coverage

§ A.3.3.1 Insurance selected and described in this Section A.3.3 shall be purchased from an insurance company or insurance companies lawfully authorized to issue insurance in the jurisdiction where the Project is located. The Contractor shall maintain the required insurance until the expiration of the period for correction of Work as set forth in Section 12.2.2 of the General Conditions, unless a different duration is stated below:

(If the Contractor is required to maintain any of the types of insurance selected below for a duration other than the expiration of the period for correction of Work, state the duration.)

« The Contractor shall purchase and maintain insurance covering the Owner's contingent liability for claims which may arise from operations under the Agreement and that will protect the Owner and the Architect and their respective officers, directors, board members, its agents and employees from and against all claims, damages, losses and expenses including attorney's fees and all other defense costs whether in legal or administrative actions arising (a) out of or resulting from the performance of the work provided that any such claim, damage, loss or expense is attributable to bodily injury, sickness, disease or death, or to injury or to destruction of tangible property (other than the work itself) including the loss of use resulting therefrom and (b) out of any claim made by any employee of the contractor or any subcontractor or by the Illinois Department of Labor for the amount of any wages or salaries which should have been paid to such employees and interest thereon, fines or other assessments relating to such violation, pursuant to provisions of the Prevailing Wage Act, 820 ILCS 130/0.01 et seq., regardless of whether or not it is caused in part by a party to whom insurance is afforded pursuant to this department. »

§ A.3.3.2 The Contractor shall purchase and maintain the following types and limits of insurance in accordance with Section A.3.3.1.

(Select the types of insurance the Contractor is required to purchase and maintain by placing an X in the box(es) next to the description(s) of selected insurance. Where policy limits are provided, include the policy limit in the appropriate fill point.)

[«»] § A.3.3.2.1 Property insurance of the same type and scope satisfying the requirements identified in

Section A.2.3, which, if selected in this section A.3.3.2.1, relieves the Owner of the responsibility to purchase and maintain such insurance except insurance required by Section A.2.3.1.3 and Section A.2.3.3. The Contractor shall comply with all obligations of the Owner under Section A.2.3 except to the extent provided below. The Contractor shall disclose to the Owner the amount of any deductible, and the Owner shall be responsible for losses within the deductible. Upon request, the Contractor shall provide the Owner with a copy of the property insurance policy or policies required. The Owner shall adjust and settle the loss with the insurer and be the trustee of the proceeds of the property insurance in accordance with Article 11 of the General Conditions unless otherwise set forth below: *(Where the Contractor's obligation to provide property insurance differs from the Owner's obligations as described under Section A.2.3, indicate such differences in the space below. Additionally, if a party other than the Owner will be responsible for adjusting and settling a loss with the insurer and acting as the trustee of the proceeds of property insurance in accordance with Article 11 of the General Conditions, indicate the responsible party below.)*

« »

[« »] § A.3.3.2.2 Railroad Protective Liability Insurance, with policy limits of not less than « » (\$ « ») per claim and « » (\$ « ») in the aggregate, for Work within fifty (50) feet of railroad property.

[« »] § A.3.3.2.3 Asbestos Abatement Liability Insurance, with policy limits of not less than « » (\$ « ») per claim and « » (\$ « ») in the aggregate, for liability arising from the encapsulation, removal, handling, storage, transportation, and disposal of asbestos-containing materials.

[« »] § A.3.3.2.4 Insurance for physical damage to property while it is in storage and in transit to the construction site on an "all-risks" completed value form.

[« »] § A.3.3.2.5 Property insurance on an "all-risks" completed value form, covering property owned by the Contractor and used on the Project, including scaffolding and other equipment.

[« »] § A.3.3.2.6 Other Insurance
(List below any other insurance coverage to be provided by the Contractor and any applicable limits.)

Coverage

Limits

§ A3.3.3 Other Insurance Requirements

§ A 3.3.3.1 Certificates of insurance acceptable to the Owner shall be filed with the Owner prior to commencement of the Work and thereafter upon renewal or replacement of each required policy of insurance. These certificates and the insurance policies required of the Contractor by this Exhibit A shall contain a provision that coverages afforded under the policies will not be canceled or allowed to expire until at least thirty (30) days' prior written notice has been given to the Owner. An additional certificate of insurance evidencing continuation of liability coverage, including coverage for completed operations, shall be submitted with the final Application for Payment as required by General Conditions A201-2017, Article 9.10 and thereafter upon renewal or replacement of such coverage until the expiration of the time required by this Exhibit A. Information concerning reduction of coverage on account of revised limits or claims paid under the General Aggregate, or both, shall be furnished by the Contractor with reasonable promptness. On the Certificate of Insurance, delete in the cancellation provision the following words, 'Endeavor to' and 'but failure to mail such notice shall impose no obligation or liability of any kind upon the company, its agents or representatives.'

§ A 3.3.3.2 The insurance company issuing the comprehensive general liability insurance coverage required for the performance of this contract shall be licensed to do business in Illinois with Best's Insurance Guide (current edition) rating of "A" or better and satisfactory to the Owner.

§ A 3.3.3.3 The Contractor shall name the Owner and the Architect and each of their respective officers, directors, officials, board members, agents and employees as additional insureds on the Contractor's general liability policy for claims arising from the Contractor's operations, the automobile liability policy and the excess/ umbrella liability policy. The foregoing policies shall be endorsed to be primary over any other insurance which the additional insureds may have and shall contain a severability of interests clause. The Contractor shall require each of its subcontractors to comply with the requirements of this Section A3.3.3.3.

§ A.3.4 Performance Bond and Payment Bond

The Contractor shall provide surety bonds, from a company or companies lawfully authorized to issue surety bonds in the jurisdiction where the Project is ~~located,~~ located with a A.M. Best rating of "A" and with a surety company for which the Owner has no objection. The Contractor's performance bond and labor and materials payment bond shall be in the amount of one hundred percent (100%) of the Contract Sum as may be adjusted from time to time by change order, as follows:

(Specify type and penal sum of bonds.)

Type

Penal Sum (\$0.00)

Payment Bond

See above.

Performance Bond

See above.

Payment and Performance Bonds shall be AIA Document A312™, Payment Bond and Performance Bond, or contain provisions identical to AIA Document A312™, current as of the date of this Agreement.

§ A 3.4.1 The Contractor shall deliver the required bonds to the Owner not later than ten days following the date of notification of the Award of Contract or if the Work is to be commenced prior thereto in response to a letter of intent, the Contractor shall, prior to the commencement of the Work, submit evidence satisfactory to the Owner that such bonds will be furnished.

§ A 3.4.2 The Contractor shall require the attorney in fact who executes the required bonds on behalf of the surety to affix thereto a certified and current copy of the power of attorney. Such bonds shall be in the form of American Institute of Architect's Document A-311 or a similar form worded exactly the same as Doc. A-311 and shall bear the same date as, or a date subsequent to, the date of the Contract. The bonds shall be issued by a bonding company licensed to operate in the State of Illinois and approved by the Owner.

§ A 3.4.3 The failure of the Contractor to supply the required bonds within 10 days after the prescribed Agreement forms are presented for signature, or if the bonding company finds that the Contractor is NOT bondable, shall constitute a default, and the Owner may award the Contract to the next responsible low bidder.

§ 3.4.5 If at any time the Owner becomes dissatisfied with any Surety or Sureties then upon the Bonds, or for any other reason such Bonds shall cease to be adequate security for the Owner, the Contractor shall, within five (5) days after notice to do so, substitute acceptable Bonds in such forms and sum and signed by such other Sureties as may be satisfactory to the Owner. No further payments shall be deemed due nor shall be made until the new Sureties shall have qualified.

§ A 3.4.6 Whenever the Contractor shall be and is declared by the Owner to be in default under the Contract, the Surety and Contractor are each responsible to make full payment to the Owner for any and all additional services of the Architect as which are required as a result of the Contractor's default and in protecting the Owner's right under the Agreement with the Contractor.

§ A 3.4.7 The Contractor must within ten (10) days after the execution of this Agreement furnish a Performance Bond agreeing to pay not less than the prevailing wage for work to be performed in accordance with the Contract and the laws of the State of Illinois, and agreeing to pay all sums of money due for labor, materials, apparatus, fixtures or machinery and transportation with respect thereto, as in said Payment Bond provided, each dated the same day as the Agreement, in the forms prescribed by the Owner and each in an amount equal to the Contract Sum with a corporate Surety or Sureties acceptable to the Owner authorized to do business in the State of Illinois. These Bonds shall be maintained by the Contractor and shall remain in full force and effect until final acceptance of the

work by the Owner or sixty (60) days following the date of Final Payment, whichever occurs later. The Contractor shall agree and shall cause the Surety to agree to be bound by each and every provision of the Contract Documents.

§ A 3.4.8 In the event the Surety will make any assignment for the benefit of creditors or commit any act of bankruptcy, or if it shall be declared bankrupt or if it shall file a voluntary petition in bankruptcy or shall in the opinion of the Owner be insolvent, the Contractor shall agree forthwith upon request of the Owner to furnish and maintain other corporate Surety with respect to such bonds satisfactory to the Owner.

ARTICLE A.4 SPECIAL TERMS AND CONDITIONS

Special terms and conditions that modify this Insurance and Bonds Exhibit, if any, are as follows:

§ A 4.1 The Contractor is responsible for determining that subcontractors are adequately insured against claims arising out of or relating to the Work. The premium cost and charges for such insurance shall be paid by each Subcontractor.

»

SECTION 00820

PREVAILING WAGE REQUIREMENTS

PART 1 – GENERAL

1.1 REQUIREMENTS

- A. Each Contractor shall comply with the requirements of the Illinois Prevailing Wage Act 820 ILCS 130/.01 et seq. which regulates the wages of laborers, workers, and mechanics employed in any Public Works project by the State, County, City or by any public body or any political subdivision or by anyone under contract for Public Works, including but not limited to: wages, medical and hospitalization insurance and retirement for those trades covered by the Act.
- B. If, during the course of work under this contract, the Department of Labor revises the prevailing rate of wages for any trade or occupation to be paid under this contract, the Contractor shall notify each Subcontractor of the changes in the prevailing rate of wages. The Contractor shall have the sole responsibility and duty to ensure that the revised prevailing rate of wages is paid by all Contractors and all Subcontractors to each laborer, worker, or mechanic to whom a revised rate is applicable. Revisions to the prevailing rate of wages as set forth above shall not result in an increase in the Contract Sum.

1.2 ACT AND ORDINANCES

- A. The Illinois Prevailing Wage Act requires all contractors and subcontractors to pay laborers, workers, and mechanics performing services on a Public Works project no less than the “prevailing rate of wages” (hourly cash wages plus fringe benefits) in the county where the work is performed.
 1. A copy of Illinois Department of Labor Prevailing Wages for Cook County effective – October 2023 is included herein.
 2. Refer to the Illinois Department of Labor’s web site for changes in the “prevailing rate of wage” throughout the duration of the project. All Contractors and Subcontractors rendering services under this contract must comply with all the requirements of the Illinois Prevailing Wage Act, including, but not limited to, all wage notice and recordkeeping duties.

END OF SECTION

Cook County Prevailing Wage Rates posted on 10/5/2023

Trade Title	Rg	Type	C	Base	Foreman	Overtime					Pension	Vac	Trng	Other Ins	Add OT 1.5x owed	Add OT 2.0x owed
						M-F	Sa	Su	Hol	H/W						
ASBESTOS ABT-GEN	All	ALL		48.90	49.90	1.5	1.5	2.0	2.0	17.37	15.91	0.00	0.91		0.00	0.00
ASBESTOS ABT-MEC	All	BLD		40.59	43.84	1.5	1.5	2.0	2.0	15.22	15.16	0.00	0.88		2.80	5.60
BOILERMAKER	All	BLD		54.71	59.63	2.0	2.0	2.0	2.0	6.97	25.06	0.00	2.83		0.00	0.00
BRICK MASON	All	BLD		50.81	55.89	1.5	1.5	2.0	2.0	12.50	23.01	0.00	1.16	0.00	0.00	0.00
CARPENTER	All	ALL		53.51	55.51	1.5	1.5	2.0	2.0	12.29	25.26	1.70	0.81		0.00	0.00
CEMENT MASON	All	ALL		50.75	52.75	2.0	1.5	2.0	2.0	17.33	22.00	0.00	1.15	0.00	1.50	3.00
CERAMIC TILE FINISHER	All	BLD		45.62	45.62	1.5	1.5	2.0	2.0	12.75	15.64	0.00	1.04	0.00	0.00	0.00
CERAMIC TILE LAYER	All	BLD		53.14	58.14	1.5	1.5	2.0	2.0	12.75	19.41	0.00	1.12	0.00	0.00	0.00
COMMUNICATION ELECTRICIAN	All	BLD		48.66	58.37	1.5	1.5	2.0	2.0	13.90	14.40	1.25	1.31	0.25	0.00	0.00
ELECTRIC PWR EQMT OP	All	ALL		60.15	66.00	1.5	1.5	2.0	2.0	13.08	20.29	0.00	3.25	0.00	0.00	0.00
ELECTRIC PWR GRNDMAN	All	ALL		46.92	66.00	1.5	1.5	2.0	2.0	10.21	15.83	0.00	2.54	0.00	0.00	0.00
ELECTRIC PWR LINEMAN	All	ALL		60.15	66.00	1.5	1.5	2.0	2.0	13.08	20.29	0.00	3.25	0.00	0.00	0.00
ELECTRICIAN	All	ALL		53.80	58.37	1.5	1.5	2.0	2.0	18.65	19.55	1.25	1.81	0.60	0.00	0.00
ELEVATOR CONSTRUCTOR	All	BLD		65.12	73.26	2.0	2.0	2.0	2.0	16.08	20.56	5.20	0.70		0.00	0.00
FENCE ERECTOR	All	ALL		48.48	50.48	1.5	1.5	2.0	2.0	13.68	18.32	0.00	0.75	0.00	0.00	0.00
GLAZIER	All	BLD		49.75	51.25	1.5	2.0	2.0	2.0	15.44	25.36	0.00	2.07	0.00	0.00	0.00
HEAT/FROST INSULATOR	All	BLD		54.12	57.37	1.5	1.5	2.0	2.0	15.22	17.86	0.00	0.88		4.15	8.30
IRON WORKER	All	ALL		57.00	59.00	2.0	2.0	2.0	2.0	17.05	25.56	0.00	0.49		0.00	0.00
LABORER	All	ALL		48.90	49.65	1.5	1.5	2.0	2.0	17.37	15.91	0.00	0.91		0.00	0.00
LATHER	All	ALL		53.51	55.51	1.5	1.5	2.0	2.0	12.29	25.26	1.70	0.81		0.00	0.00
MACHINIST	All	BLD		55.74	59.74	1.5	1.5	2.0	2.0	9.93	8.95	1.85	1.47		0.00	0.00
MARBLE FINISHER	All	ALL		38.75	52.46	1.5	1.5	2.0	2.0	12.50	20.95	0.00	0.66	0.00	0.00	0.00
MARBLE SETTER	All	BLD		49.96	54.96	1.5	1.5	2.0	2.0	12.50	22.31	0.00	0.85	0.00	0.00	0.00
MATERIAL TESTER I	All	ALL		38.90		1.5	1.5	2.0	2.0	17.37	15.91	0.00	0.91		0.00	0.00
MATERIALS TESTER II	All	ALL		43.90		1.5	1.5	2.0	2.0	17.37	15.91	0.00	0.91		0.00	0.00
MILLWRIGHT	All	ALL		53.51	55.51	1.5	1.5	2.0	2.0	12.29	25.26	1.70	0.81		0.00	0.00

Cook County Prevailing Wage Rates posted on 10/5/2023

OPERATING ENGINEER	All	BLD	1	56.60	60.60	2.0	2.0	2.0	2.0	22.95	20.05	2.00	2.70		0.00	0.00
OPERATING ENGINEER	All	BLD	2	55.30	60.60	2.0	2.0	2.0	2.0	22.95	20.05	2.00	2.70		0.00	0.00
OPERATING ENGINEER	All	BLD	3	52.75	60.60	2.0	2.0	2.0	2.0	22.95	20.05	2.00	2.70		0.00	0.00
OPERATING ENGINEER	All	BLD	4	51.00	60.60	2.0	2.0	2.0	2.0	22.95	20.05	2.00	2.70		0.00	0.00
OPERATING ENGINEER	All	BLD	5	60.35	60.60	2.0	2.0	2.0	2.0	22.95	20.05	2.00	2.70		0.00	0.00
OPERATING ENGINEER	All	BLD	6	57.60	60.60	2.0	2.0	2.0	2.0	22.95	20.05	2.00	2.70		0.00	0.00
OPERATING ENGINEER	All	BLD	7	59.60	60.60	2.0	2.0	2.0	2.0	22.95	20.05	2.00	2.70		0.00	0.00
OPERATING ENGINEER	All	FLT	1	64.55	64.55	1.5	1.5	2.0	2.0	22.95	20.05	2.00	2.70		0.00	0.00
OPERATING ENGINEER	All	FLT	2	63.05	64.55	1.5	1.5	2.0	2.0	22.95	20.05	2.00	2.70		0.00	0.00
OPERATING ENGINEER	All	FLT	3	58.55	64.55	1.5	1.5	2.0	2.0	22.95	20.05	2.00	2.70		0.00	0.00
OPERATING ENGINEER	All	FLT	4	54.05	64.55	1.5	1.5	2.0	2.0	22.95	20.05	2.00	2.70		0.00	0.00
OPERATING ENGINEER	All	FLT	5	66.05	64.55	1.5	1.5	2.0	2.0	22.95	20.05	2.00	2.70		0.00	0.00
OPERATING ENGINEER	All	FLT	6	54.05	64.55	1.5	1.5	2.0	2.0	22.95	20.05	2.00	2.70		0.00	0.00
OPERATING ENGINEER	All	HWY	1	54.80	58.80	1.5	1.5	2.0	2.0	22.95	20.05	2.00	2.70		0.00	0.00
OPERATING ENGINEER	All	HWY	2	54.25	58.80	1.5	1.5	2.0	2.0	22.95	20.05	2.00	2.70		0.00	0.00
OPERATING ENGINEER	All	HWY	3	52.20	58.80	1.5	1.5	2.0	2.0	22.95	20.05	2.00	2.70		0.00	0.00
OPERATING ENGINEER	All	HWY	4	50.80	58.80	1.5	1.5	2.0	2.0	22.95	20.05	2.00	2.70		0.00	0.00
OPERATING ENGINEER	All	HWY	5	49.60	58.80	1.5	1.5	2.0	2.0	22.95	20.05	2.00	2.70		0.00	0.00
OPERATING ENGINEER	All	HWY	6	57.80	58.80	1.5	1.5	2.0	2.0	22.95	20.05	2.00	2.70		0.00	0.00
OPERATING ENGINEER	All	HWY	7	55.80	58.80	1.5	1.5	2.0	2.0	22.95	20.05	2.00	2.70		0.00	0.00
ORNAMENTAL IRON WORKER	All	ALL		55.01	57.51	2.0	2.0	2.0	2.0	14.23	26.00	0.00	2.00	0.00	0.00	0.00
PAINTER	All	ALL		51.55	57.99	1.5	1.5	1.5	2.0	14.76	15.69	0.00	1.86	0.00	0.00	0.00
PAINTER - SIGNS	All	BLD		41.55	46.67	1.5	1.5	2.0	2.0	3.04	3.90	0.00	0.00	0.00	0.00	0.00
PILEDRIVER	All	ALL		53.51	55.51	1.5	1.5	2.0	2.0	12.29	25.26	1.70	0.81		0.00	0.00
PIPEFITTER	All	BLD		55.00	58.00	1.5	1.5	2.0	2.0	12.65	22.85	0.00	3.12	0.00	0.00	0.00
PLASTERER	All	BLD		48.75	51.68	1.5	1.5	2.0	2.0	17.33	20.33	0.00	1.15	0.00	0.00	0.00
PLUMBER	All	BLD		56.80	60.20	1.5	1.5	2.0	2.0	17.00	17.29	0.00	1.73		0.00	0.00
ROOFER	All	BLD		49.00	54.00	1.5	1.5	2.0	2.0	11.83	15.56	0.00	0.99	0.00	0.00	0.00
SHEETMETAL WORKER	All	BLD		51.15	55.24	1.5	1.5	2.0	2.0	14.18	28.45	0.00	1.05	0.00	0.00	0.00

Cook County Prevailing Wage Rates posted on 10/5/2023

SIGN HANGER	All	BLD		34.72	37.50	1.5	1.5	2.0	2.0	6.85	4.50	0.00	0.00	0.00	0.00	0.00
SPRINKLER FITTER	All	BLD		56.70	59.45	1.5	1.5	2.0	2.0	14.45	18.70	0.00	0.75	0.00	0.00	0.00
STEEL ERECTOR	All	ALL		57.00	59.00	2.0	2.0	2.0	2.0	17.05	25.56	0.00	0.49		0.00	0.00
STONE MASON	All	BLD		50.81	55.89	1.5	1.5	2.0	2.0	12.50	23.01	0.00	1.16	0.00	0.00	0.00
TERRAZZO FINISHER	All	BLD		46.94	46.94	1.5	1.5	2.0	2.0	12.75	17.73	0.00	1.07	0.00	0.00	0.00
TERRAZZO MECHANIC	All	BLD		50.85	54.35	1.5	1.5	2.0	2.0	12.75	19.12	0.00	1.10	0.00	0.00	0.00
TRAFFIC SAFETY WORKER I	All	HWY		40.10	41.70	1.5	1.5	2.0	2.0	10.60	9.35	0.00	1.00	0.00	0.00	0.00
TRAFFIC SAFETY WORKER II	ALL	HWY		41.10	42.70	1.5	1.5	2.0	2.0	10.60	9.35	0.00	1.00	0.00	0.00	0.00
TRUCK DRIVER	E	ALL	1	41.75	42.40	1.5	1.5	2.0	2.0	12.80	15.74	0.00	0.15	0.00	0.00	0.00
TRUCK DRIVER	E	ALL	2	42.00	42.40	1.5	1.5	2.0	2.0	12.80	15.74	0.00	0.15	0.00	0.00	0.00
TRUCK DRIVER	E	ALL	3	42.20	42.40	1.5	1.5	2.0	2.0	12.80	15.74	0.00	0.15	0.00	0.00	0.00
TRUCK DRIVER	E	ALL	4	42.40	42.40	1.5	1.5	2.0	2.0	12.80	15.74	0.00	0.15	0.00	0.00	0.00
TRUCK DRIVER	W	ALL	1	42.18	42.73	1.5	1.5	2.0	2.0	11.20	15.46	0.00	0.15	0.00	0.00	0.00
TRUCK DRIVER	W	ALL	2	42.33	42.73	1.5	1.5	2.0	2.0	11.20	15.46	0.00	0.15	0.00	0.00	0.00
TRUCK DRIVER	W	ALL	3	42.53	42.73	1.5	1.5	2.0	2.0	11.20	15.46	0.00	0.15	0.00	0.00	0.00
TRUCK DRIVER	W	ALL	4	42.73	42.73	1.5	1.5	2.0	2.0	11.20	15.46	0.00	0.15	0.00	0.00	0.00
TUCK POINTER	All	BLD		50.53	51.53	1.5	1.5	2.0	2.0	9.55	21.72	0.00	1.11	0.00	0.00	0.00

Legend

Rg Region

Type Trade Type - All,Highway,Building,Floating,Oil & Chip,Rivers

C Class

Base Base Wage Rate

OT M-F Unless otherwise noted, OT pay is required for any hour greater than 8 worked each day, Mon through Fri. The number listed is the multiple of the base wage.

OT Sa Overtime pay required for every hour worked on Saturdays

OT Su Overtime pay required for every hour worked on Sundays

OT Hol Overtime pay required for every hour worked on Holidays

H/W Health/Welfare benefit

Vac Vacation

Trng Training

Other Ins Employer hourly cost for any other type(s) of insurance provided for benefit of worker.

Explanations COOK COUNTY

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The following list is considered as those days for which holiday rates of wages for work performed apply: New Years Day, Memorial Day, Fourth of July, Labor Day, Thanksgiving Day, Christmas Day and Veterans Day in some classifications/counties. Generally, any of these holidays which fall on a Sunday is celebrated on the following Monday. This then makes work performed on that Monday payable at the appropriate overtime rate for holiday pay. Common practice in a given local may alter certain days of celebration. If in doubt, please check with IDOL.

TRUCK DRIVERS (WEST) - That part of the county West of Barrington Road.

EXPLANATION OF CLASSES

ASBESTOS - GENERAL - removal of asbestos material/mold and hazardous materials from any place in a building, including mechanical systems where those mechanical systems are to be removed. This includes the removal of asbestos materials/mold and hazardous materials from ductwork or pipes in a building when the building is to be demolished at the time or at some close future date. ASBESTOS - MECHANICAL - removal of asbestos material from mechanical systems, such as pipes, ducts, and boilers, where the mechanical systems are to remain.

CERAMIC TILE FINISHER

The grouting, cleaning, and polishing of all classes of tile, whether for interior or exterior purposes, all burned, glazed or unglazed products; all composition materials, granite tiles, warning detectable tiles, cement tiles, epoxy composite materials, pavers, glass, mosaics, fiberglass, and all substitute materials, for tile made in tile-like units; all mixtures in tile like form of cement, metals, and other materials that are for and intended for use as a finished floor surface, stair treads, promenade roofs, walks, walls, ceilings, swimming pools, and all other places where tile is to form a finished interior or exterior. The mixing of all setting mortars including but not limited to thin-set mortars, epoxies, wall mud, and any other sand and cement mixtures or adhesives when used in the preparation, installation, repair, or maintenance of tile and/or similar materials. The handling and unloading of all sand, cement, lime, tile, fixtures, equipment, adhesives, or any other materials to be used in the preparation, installation, repair, or maintenance of tile and/or similar materials. Ceramic Tile Finishers shall fill all joints and voids regardless of method on all tile work, particularly and especially after installation of said tile work. Application of any and all protective coverings to all types of tile installations including, but not be limited to, all soap compounds, paper products, tapes, and all polyethylene coverings, plywood, masonite, cardboard, and any new type of products that may be used to protect tile installations, Blastrac equipment, and all floor scarifying equipment used in preparing floors to receive tile. The clean up and removal of all waste and materials. All demolition of existing tile floors and walls to be re-tiled.

COMMUNICATIONS ELECTRICIAN

Installation, operation, inspection, maintenance, repair and service of radio, television, recording, voice sound vision production and reproduction, telephone and telephone interconnect, facsimile, data apparatus, coaxial, fibre optic and wireless equipment, appliances and systems used for the transmission and reception of signals of any nature, business, domestic, commercial, education, entertainment, and residential purposes, including but not limited to, communication and telephone, electronic and sound equipment, fibre optic and data communication systems, and the performance of any task directly related to such installation or service whether at new or existing sites, such tasks to include the placing of wire and cable and electrical power

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conduit or other raceway work within the equipment room and pulling wire and/or cable through conduit and the installation of any incidental conduit, such that the employees covered hereby can complete any job in full.

MARBLE FINISHER

Loading and unloading trucks, distribution of all materials (all stone, sand, etc.), stocking of floors with material, performing all rigging for heavy work, the handling of all material that may be needed for the installation of such materials, building of scaffolding, polishing if needed, patching, waxing of material if damaged, pointing up, caulking, grouting and cleaning of marble, holding water on diamond or Carborundum blade or saw for setters cutting, use of tub saw or any other saw needed for preparation of material, drilling of holes for wires that anchor material set by setters, mixing up of molding plaster for installation of material, mixing up thin set for the installation of material, mixing up of sand to cement for the installation of material and such other work as may be required in helping a Marble Setter in the handling of all material in the erection or installation of interior marble, slate, travertine, art marble, serpentine, alberene stone, blue stone, granite and other stones (meaning as to stone any foreign or domestic materials as are specified and used in building interiors and exteriors and customarily known as stone in the trade), carrara, sanionyx, vitrolite and similar opaque glass and the laying of all marble tile, terrazzo tile, slate tile and precast tile, steps, risers treads, base, or any other materials that may be used as substitutes for any of the aforementioned materials and which are used on interior and exterior which are installed in a similar manner.

MATERIAL TESTER I: Hand coring and drilling for testing of materials; field inspection of uncured concrete and asphalt.

MATERIAL TESTER II: Field inspection of welds, structural steel, fireproofing, masonry, soil, facade, reinforcing steel, formwork, cured concrete, and concrete and asphalt batch plants; adjusting proportions of bituminous mixtures.

OPERATING ENGINEER - BUILDING

Class 1. Asphalt Plant; Asphalt Spreader; Autograde; Backhoes with Caisson Attachment; Batch Plant; Benoto (requires Two Engineers); Boiler and Throttle Valve; Caisson Rigs; Central Redi-Mix Plant; Combination Back Hoe Front End-loader Machine; Compressor and Throttle Valve; Concrete Breaker (Truck Mounted); Concrete Conveyor; Concrete Conveyor (Truck Mounted); Concrete Paver Over 27E cu. ft; Concrete Paver 27E cu. ft. and Under; Concrete Placer; Concrete Placing Boom; Concrete Pump (Truck Mounted); Concrete Tower; Cranes, All; Cranes, Hammerhead; Cranes, (GCI and similar Type); Creter Crane; Spider Crane; Crusher, Stone, etc.; Derricks, All; Derricks, Traveling; Formless Curb and Gutter Machine; Grader, Elevating; Grouting Machines; Heavy Duty Self-Propelled Transporter or Prime Mover; Highlift Shovels or Front Endloader 2-1/4 yd. and over; Hoists, Elevators, outside type rack and pinion and similar machines; Hoists, One, Two and Three Drum; Hoists, Two Tugger One Floor; Hydraulic Backhoes; Hydraulic Boom Trucks; Hydro Vac (and similar equipment); Locomotives, All; Motor Patrol; Lubrication Technician; Manipulators; Pile Drivers and Skid Rig; Post Hole Digger; Pre-Stress Machine; Pump Cretes Dual Ram; Pump Cretes: Squeeze Cretes-Screw Type Pumps; Gypsum Bulker and Pump; Raised and Blind Hole Drill; Roto Mill Grinder; Scoops - Tractor Drawn; Slip-Form Paver; Straddle Buggies; Operation of Tie Back Machine; Tournapull; Tractor with Boom and Side Boom; Trenching Machines.

Class 2. Boilers; Broom, All Power Propelled; Bulldozers; Concrete Mixer (Two Bag and Over); Conveyor, Portable; Forklift Trucks; Highlift Shovels or Front Endloaders under 2-1/4 yd.; Hoists, Automatic; Hoists, Inside Elevators; Hoists, Sewer Dragging Machine; Hoists, Tugger Single Drum; Laser Screed; Rock Drill (Self-Propelled); Rock Drill (Truck Mounted); Rollers, All; Steam Generators;

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Tractors, All; Tractor Drawn Vibratory Roller; Winch Trucks with "A" Frame.

Class 3. Air Compressor; Combination Small Equipment Operator; Generators; Heaters, Mechanical; Hoists, Inside Elevators (remodeling or renovation work); Hydraulic Power Units (Pile Driving, Extracting, and Drilling); Pumps, over 3" (1 to 3 not to exceed a total of 300 ft.); Low Boys; Pumps, Well Points; Welding Machines (2 through 5); Winches, 4 Small Electric Drill Winches.

Class 4. Bobcats and/or other Skid Steer Loaders; Oilers; and Brick Forklift.

Class 5. Assistant Craft Foreman.

Class 6. Gradall.

Class 7. Mechanics; Welders.

OPERATING ENGINEERS - HIGHWAY CONSTRUCTION

Class 1. Asphalt Plant; Asphalt Heater and Planer Combination; Asphalt Heater Scarfire; Asphalt Spreader; Autograder/GOMACO or other similar type machines; ABG Paver; Backhoes with Caisson Attachment; Ballast Regulator; Belt Loader; Caisson Rigs; Car Dumper; Central Redi-Mix Plant; Combination Backhoe Front Endloader Machine, (1 cu. yd. Backhoe Bucket or over or with attachments); Concrete Breaker (Truck Mounted); Concrete Conveyor; Concrete Paver over 27E cu. ft.; Concrete Placer; Concrete Tube Float; Cranes, all attachments; Cranes, Tower Cranes of all types: Creter Crane; Spider Crane; Crusher, Stone, etc.; Derricks, All; Derrick Boats; Derricks, Traveling; Dredges; Elevators, Outside type Rack & Pinion and Similar Machines; Formless Curb and Gutter Machine; Grader, Elevating; Grader, Motor Grader, Motor Patrol, Auto Patrol, Form Grader, Pull Grader, Subgrader; Guard Rail Post Driver Truck Mounted; Hoists, One, Two and Three Drum; Heavy Duty Self-Propelled Transporter or Prime Mover; Hydraulic Backhoes; Backhoes with shear attachments up to 40' of boom reach; Lubrication Technician; Manipulators; Mucking Machine; Pile Drivers and Skid Rig; Pre-Stress Machine; Pump Cretes Dual Ram; Rock Drill - Crawler or Skid Rig; Rock Drill - Truck Mounted; Rock/Track Tamper; Roto Mill Grinder; Slip-Form Paver; Snow Melters; Soil Test Drill Rig (Truck Mounted); Straddle Buggies; Hydraulic Telescoping Form (Tunnel); Operation of Tieback Machine; Tractor Drawn Belt Loader; Tractor Drawn Belt Loader (with attached pusher - two engineers); Tractor with Boom; Tractaire with Attachments; Traffic Barrier Transfer Machine; Trenching; Truck Mounted Concrete Pump with Boom; Raised or Blind Hole Drills (Tunnel Shaft); Underground Boring and/or Mining Machines 5 ft. in diameter and over tunnel, etc; Underground Boring and/or Mining Machines under 5 ft. in diameter; Wheel Excavator; Widener (APSCO).

Class 2. Batch Plant; Bituminous Mixer; Boiler and Throttle Valve; Bulldozers; Car Loader Trailing Conveyors; Combination Backhoe Front Endloader Machine (Less than 1 cu. yd. Backhoe Bucket or over or with attachments); Compressor and Throttle Valve; Compressor, Common Receiver (3); Concrete Breaker or Hydro Hammer; Concrete Grinding Machine; Concrete Mixer or Paver 7S Series to and including 27 cu. ft.; Concrete Spreader; Concrete Curing Machine, Burlap Machine, Belting Machine and Sealing Machine; Concrete Wheel Saw; Conveyor Muck Cars (Haglund or Similar Type); Drills, All; Finishing Machine - Concrete; Highlift Shovels or Front Endloader; Hoist - Sewer Dragging Machine; Hydraulic Boom Trucks (All Attachments); Hydro-Blaster; Hydro Excavating (excluding hose work); Laser Screed; All Locomotives, Dinky; Off-Road Hauling Units (including articulating) Non Self-Loading Ejection Dump; Pump Cretes: Squeeze Cretes - Screw Type Pumps, Gypsum Bulker and Pump; Roller, Asphalt; Rotary Snow Plows; Rototiller, Seaman, etc., self-propelled; Self-Propelled Compactor; Spreader - Chip - Stone, etc.; Scraper - Single/Twin

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Engine/Push and Pull; Scraper - Prime Mover in Tandem (Regardless of Size); Tractors pulling attachments, Sheeps Foot, Disc, Compactor, etc.; Tug Boats.

Class 3. Boilers; Brooms, All Power Propelled; Cement Supply Tender; Compressor, Common Receiver (2); Concrete Mixer (Two Bag and Over); Conveyor, Portable; Farm-Type Tractors Used for Mowing, Seeding, etc.; Forklift Trucks; Grouting Machine; Hoists, Automatic; Hoists, All Elevators; Hoists, Tugger Single Drum; Jeep Diggers; Low Boys; Pipe Jacking Machines; Post-Hole Digger; Power Saw, Concrete Power Driven; Pug Mills; Rollers, other than Asphalt; Seed and Straw Blower; Steam Generators; Stump Machine; Winch Trucks with "A" Frame; Work Boats; Tamper-Form-Motor Driven.

Class 4. Air Compressor; Combination - Small Equipment Operator; Directional Boring Machine; Generators; Heaters, Mechanical; Hydraulic Power Unit (Pile Driving, Extracting, or Drilling); Light Plants, All (1 through 5); Pumps, over 3" (1 to 3 not to exceed a total of 300 ft.); Pumps, Well Points; Vacuum Trucks (excluding hose work); Welding Machines (2 through 5); Winches, 4 Small Electric Drill Winches.

Class 5. SkidSteer Loader (all); Brick Forklifts; Oilers.

Class 6. Field Mechanics and Field Welders

Class 7. Dowell Machine with Air Compressor; Gradall and machines of like nature.

OPERATING ENGINEER - FLOATING

Class 1. Craft Foreman; Master Mechanic; Diver/Wet Tender; Engineer; Engineer (Hydraulic Dredge).

Class 2. Crane/Backhoe Operator; Boat Operator with towing endorsement; Mechanic/Welder; Assistant Engineer (Hydraulic Dredge); Leverman (Hydraulic Dredge); Diver Tender.

Class 3. Deck Equipment Operator, Machineryman, Maintenance of Crane (over 50 ton capacity) or Backhoe (115,000 lbs. or more); Tug/Launch Operator; Loader/Dozer and like equipment on Barge, Breakwater Wall, Slip/Dock, or Scow, Deck Machinery, etc.

Class 4. Deck Equipment Operator, Machineryman/Fireman (4 Equipment Units or More); Off Road Trucks; Deck Hand, Tug Engineer, Crane Maintenance (50 Ton Capacity and Under) or Backhoe Weighing (115,000 pounds or less); Assistant Tug Operator.

Class 5. Friction or Lattice Boom Cranes.

Class 6. ROV Pilot, ROV Tender

TERRAZZO FINISHER

The handling of sand, cement, marble chips, and all other materials that may be used by the Mosaic Terrazzo Mechanic, and the mixing, grinding, grouting, cleaning and sealing of all Marble, Mosaic, and Terrazzo work, floors, base, stairs, and wainscoting by hand or machine, and in addition, assisting and aiding Marble, Masonic, and Terrazzo Mechanics.

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TRAFFIC SAFETY Worker I

Traffic Safety Worker I - work associated with the delivery, installation, pick-up and servicing of safety devices during periods of roadway construction, including such work as set-up and maintenance of barricades, barrier wall reflectors, drums, cones, delineators, signs, crash attenuators, glare screen and other such items, and the layout and application or removal of conflicting and/or temporary roadway markings utilized to control traffic in construction zones, as well as flagging for these operations.

TRAFFIC SAFETY WORKER II

Work associated with the installation and removal of permanent pavement markings and/or pavement markers including both installations performed by hand and installations performed by truck.

TRUCK DRIVER - BUILDING, HEAVY AND HIGHWAY CONSTRUCTION - EAST & WEST

Class 1. Two or three Axle Trucks. A-frame Truck when used for transportation purposes; Air Compressors and Welding Machines, including those pulled by cars, pick-up trucks and tractors; Ambulances; Batch Gate Lockers; Batch Hopperman; Car and Truck Washers; Carry-alls; Fork Lifts and Hoisters; Helpers; Mechanics Helpers and Greasers; Oil Distributors 2-man operation; Pavement Breakers; Pole Trailer, up to 40 feet; Power Mower Tractors; Self-propelled Chip Spreader; Skipman; Slurry Trucks, 2-man operation; Slurry Truck Conveyor Operation, 2 or 3 man; Teamsters; Unskilled Dumpman; and Truck Drivers hauling warning lights, barricades, and portable toilets on the job site.

Class 2. Four axle trucks; Dump Crets and Adgetors under 7 yards; Dumpsters, Track Trucks, Euclids, Hug Bottom Dump Turnapulls or Turnatrailers when pulling other than self-loading equipment or similar equipment under 16 cubic yards; Mixer Trucks under 7 yards; Ready-mix Plant Hopper Operator, and Winch Trucks, 2 Axles.

Class 3. Five axle trucks; Dump Crets and Adgetors 7 yards and over; Dumpsters, Track Trucks, Euclids, Hug Bottom Dump Turnatrailers or turnapulls when pulling other than self-loading equipment or similar equipment over 16 cubic yards; Explosives and/or Fission Material Trucks; Mixer Trucks 7 yards or over; Mobile Cranes while in transit; Oil Distributors, 1-man operation; Pole Trailer, over 40 feet; Pole and Expandable Trailers hauling material over 50 feet long; Slurry trucks, 1-man operation; Winch trucks, 3 axles or more; Mechanic--Truck Welder and Truck Painter.

Class 4. Six axle trucks; Dual-purpose vehicles, such as mounted crane trucks with hoist and accessories; Foreman; Master Mechanic; Self-loading equipment like P.B. and trucks with scoops on the front.

Other Classifications of Work:

For definitions of classifications not otherwise set out, the Department generally has on file such definitions which are available. If a task to be performed is not subject to one of the classifications of pay set out, the Department will upon being contacted state which neighboring county has such a classification and provide such rate, such rate being deemed to exist by reference in this document. If no neighboring county rate applies to the task, the Department shall undertake a special determination, such special determination being then deemed to have existed under this determination. If a project requires these, or any classification not listed, please contact IDOL at 217-782-1710 for wage rates or clarifications.

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LANDSCAPING

Landscaping work falls under the existing classifications for laborer, operating engineer and truck driver. The work performed by landscape plantsman and landscape laborer is covered by the existing classification of laborer. The work performed by landscape operators (regardless of equipment used or its size) is covered by the classifications of operating engineer. The work performed by landscape truck drivers (regardless of size of truck driven) is covered by the classifications of truck driver.

MATERIAL TESTER & MATERIAL TESTER/INSPECTOR I AND II

Notwithstanding the difference in the classification title, the classification entitled "Material Tester I" involves the same job duties as the classification entitled "Material Tester/Inspector I". Likewise, the classification entitled "Material Tester II" involves the same job duties as the classification entitled "Material Tester/Inspector II".

SECTION 01100

SUMMARY

PART 1 – GENERAL

1.1 PROJECT

- A. Project Name: New Fernway Park Elementary School.
- B. Owner's Name: Kirby School District 140.
- C. The Project consists of the construction of a new masonry school and early childhood center and other site work.
 - 1. The Project scope consists of, but is not limited to, site concrete and asphalt paving; landscaping; concrete; masonry, structural steel work, window and metal panel installation, roof work, aluminum curtain wall, storefront and door installation; hollow metal frames and wood door installation; flooring and finishes work; ceiling work; athletic equipment installation; mechanical, plumbing, fire protection, and electrical work.
- D. The contractor for the **New Fernway Park Elementary School** project will also be responsible for:
 - 1. Coordination of abatement work (under separate contract) to be completed during the construction of this project.
 - 2. Contractor is responsible for coordination of owner pre-purchased equipment including, but not limited to: delivery, off-site storage (if needed) and installation. Refer to drawings and specifications for more information.
 - a. Anticipated Pre-Purchased Equipment and anticipated delivery dates:
 - 1) Chillers – December 15, 2024
 - 2) Generator - December 15, 2024
 - 3) Transfer Switches- December 15, 2024

1.2 CONTRACT DESCRIPTION

- A. Work covered by Contract Documents: As defined in the contract documents.
- B. Definitions. The following terms are used throughout the Contract Documents. The work will be governed in accord with the definitions.
 - 1. Fabricated: Fabricated pertains to items specifically assembled or made of selected materials or components to meet individual design requirements.
 - 2. Manufactured: Manufactured means standard units, usually mass produced by an established manufacturer of the respective item.
 - 3. Provide: Provide means furnish and install.
 - 4. Shop fabricated or shop made: Shop fabricated or shop made refers to items made by a Contractor or Subcontractor in their own Shop.
- C. Insurance
 - 1. Designated Purchaser:
 - a. Owner shall purchase and maintain Builder's Risk Insurance in accord with the General Conditions.
 - b. The Owner's insurance will be subject to a deductible of \$5,000 per occurrence.
- D. Contracts
 - 1. The Owner will award a single construction contract for all work specified in the Contract Documents.
 - 2. Upon award of the construction contract, the owner will issue a Letter of Intent to award a Construction Contract to the approved contractor. This Letter of Intent shall serve as a notice to proceed with the project according to the terms and conditions set forth in the Contract Documents, until the work under Contract Documents is completed. . The contractor shall commence all construction services as specified in the contract documents upon receipt of the Letter of Intent.

1.3 DUTIES OF CONTRACTOR

- A. The contractor shall be responsible for providing and paying for:
 - 1. Labor, materials and equipment.
 - 2. Tools, construction equipment and machinery.
 - 3. Temporary water, heat and other utilities required for construction.

SECTION 01100

SUMMARY

4. Other facilities and services necessary for proper execution and completion of work.
- B. The contractor shall be responsible for paying and securing all permits, governmental fees and licenses other than primary building permit necessary for the proper execution and completion of the Project.
- C. The contractor shall comply with all codes, ordinances, rules, regulations, orders and other legal requirements of the public authorities which govern the performance of the work under the Contract Documents.
- D. The contractor shall coordinate and have completed all inspections required by public authorities relating to the performance of the work under the Contract Documents including, but not limited to:
 1. Illinois Department of Public Health (IDPH) for all rough-in and final inspections of plumbing as required.
 2. All inspections required in Section 01400 to be performed by a Testing and Inspection Agency.
- E. The contractor shall have duty to promptly submit written notice to the Architect of any known or observed variances of the Contract Documents from legal requirements that may govern the work. Upon notice to the Architect, appropriate modifications will be made to the Contract Documents to account for the legal requirements. In the event the contractor fails to provide notice of any variances, he shall assume responsibility for any work known to be contrary to those legal requirements.
 1. The contractor shall enforce strict discipline and maintain good order among employees and subcontractors. Contractor shall not employ unfit person of those not skilled in the assigned task
- F. The contractor acknowledges that the Project is exempt from all State and Local use taxes. It shall be the duty of the contractor to: 1) obtain a sales tax exemption certificate number from the Owner; 2) place exemption certificate number on invoices for materials incorporated in work; 3) furnish copies of invoices to Owner upon request 4) file a notarized statement that all purchases made under exemption certificate were entitled to be exempt with Owner upon completion of work; and 5) pay any penalties assessed for the improper use of exemption certificate number.

1.4 OWNER OCCUPANCY

- A. The date of Substantial Completion shall be no later than Phase 1 – July 15, 2025, 5:00 p.m. and Phase 2 – October 30, 2025, 5:00 p.m. Note: Substantial Completion for this project refers to all scheduled work being a minimum 99% complete.
- B. The date of Final Completion shall be no later than November 30, 2025, 5:00 p.m. Note: Final Completion for this project refers to all scheduled work, punch list and closeout items being 100% complete.
- C. The Architect's and their consultants' services will terminate sixty (60) days after (1) the date of Substantial Completion of the Work or (2) the anticipated date of Substantial Completion identified in Specifications, whichever is earlier. Any work required of the Architect and their consultants after this date will be back-charged to the contractor by the Owner.
- D. Refer to General Conditions for Liquidated Damages.

1.5 JOB OPERATIONS

- A. Project Security:
 1. The contractor shall provide necessary precautions such as fences or barriers to protect Owner's personnel or members of the general public in the areas in which construction activity is on-going.
 2. The contractor shall securely close-off all areas of construction after working hours to prevent entry by unauthorized persons.

SECTION 01100

SUMMARY

- B. Project Hours:
 - 1. All work will be restricted between 7:40 a.m. and 8:20 a.m. and between 2:00 p.m. and 2:50 p.m. because of student drop off and pick up with the following exceptions (all dates listed below are based on the current school calendar and are subject to change):
 - a. Exception - Summer Break
 - b. Exception - Winter Break
 - 2. The Owner may choose to restrict work hours if the Owner/District feels the contractor is causing disruption to the learning environment, etc.
 - 3. Note: Village of Orland Park and Orland Hills noise ordinance apply (verify times).

1.6 WORK LIMITATIONS

- A. Anticipated MWRD Permit approval date is February 28, 2024.
- B. No contractors can be in the existing building during school hours unless escorted by a district staff member. If a contractor needs to get into the existing building during school hours it will need to be set up with the maintenance department to be escorted.
- C. All spaces around where work will be done may be occupied by Owner's personnel. Contractor shall limit the scope of its work during times of owner occupancy to prevent disturbing Owner.
- D. Contractor shall schedule work in such a manner as to not disrupt mechanical or electrical systems for the existing adjacent buildings during times of Owner occupancy.
- E. Contractor shall give Owner a minimum of three (3) days' notice before commencing work in Owner occupied area.

1.7 CONTRACTOR USE OF SITE AND PREMISES

- A. Contractor shall confine work at the Project site as permitted by: 1) Law; 2) Permits; 3) the Contract Documents; 4) As instructed by Owner or Owner's representative; and 5) As required for Owner's use of adjacent facilities.
- B. Confer with Owner's representative and obtain full knowledge of all Project site rules and regulations affecting work.
- C. Contractor shall conform to the Project Site rules and regulations while engaged in its work.
- D. Contractor acknowledges that the Project Site rules and regulations take precedence over other rules and regulations that may exist outside such jurisdiction.
- E. Contractor shall be obligated to permit the Owner's representative to examine the contractor's list of employees, including those of his subcontractors and their agents, working on the Project Site. Contractor shall
 - 1. Keep all vehicles, mechanized or motorized equipment locked and secured at all times when parked and unattended on Owner's premises.
 - 2. Contractor shall not, under any circumstance, leave any vehicle unattended with its motor or engine running, or with its ignition key in place.
 - 3. All traffic control subject to Owner's representative's approval.
- F. Do not unreasonably encumber site with materials or equipment.
- G. Contractor shall assume full responsibility for protection safety and safekeeping of products stored on premises.
- H. Contractor shall move all stored products or equipment which interferes with operations of Owner or other subcontractors.
- I. Contractor shall obtain and pay for the use of additional storage or work areas needed for operations.
- J. Contractor shall limit use of the Project Site for work and storage to areas depicted in the drawing or area approved in advance by Owner.
- K. The contractor acknowledges that adjacent sites may be used by the Owner or members of the general public requiring contractor to maintain appropriate safety measures.
- L. The contractor shall provide access to and from the Project Site as required by law and by Owner:

SECTION 01100

SUMMARY

- M. Emergency Building Exits During Construction: Keep all exits required by code open during construction period; provide temporary exit signs if exit routes are temporarily altered.
- N. Arrange use of site and premises to allow:
 - 1. Drop off and pick up of students via buses and cars.

1.8 SUBSTANCE ABUSE PREVENTION POLICY

- A. Pursuant to the Substance Abuse Prevention on Public Works Act (820 IL CS 265/1, et seq.), employees of the contractor and employees of the contractor and employees of any subcontractor are prohibited from the use of drugs or alcohol , as defined in the Act, while performing on any public works project.
- B. The contractor and any subcontractor shall file with the public body engaged in the construction of the public works: a copy of the substance abuse prevention program along with a cover letter certifying that their program meets the requirements of the Act or a letter certifying that the contractor or subcontractor has a collective bargaining agreement in effect dealing with the subject matter of this Act. A certification form is attached and must be completed by the contractor and each subcontractor to this contract.

1.9 WINTER PROTECTION AND WORK

- A. Contractor shall provide and pay for all materials, equipment, labor, utilities, transportation, etc. required to completely enclose and “winter protect” the Project Site during construction. The schedule dictates that complete enclosure will be required to complete the Project in a timely manner. No extensions of time or additional fees will be approved for any delays due to weather or Project Site conditions.
- B. The Project Site and access routes are to be maintained as required to facilitate the winter protection and work.

1.10 WORK SEQUENCE

- A. Construction services as specified herein shall commence upon issuance of the Letter of Intent to Award a Construction Contract.
- B. Certificate of Insurance and all Bonds to be submitted to the Architect within 3 business days upon issuance of the Letter of Intent.
- C. All Shop Drawings to be submitted to the Architect within 21 calendar days upon issuance of the Letter of Intent.

PART 2 – PRODUCTS – NOT USED

PART 3 – EXECUTION – NOT USED

END OF SECTION

SECTION 01200

PRICE AND PAYMENT PROCEDURES

PART 1 – GENERAL

1.1 SECTION INCLUDES

- A. Procedures for preparation and submittal of applications for progress payments.
- B. Change order procedures.

1.2 RELATED SECTIONS

- A. Section 01210 - Allowances: Payment procedures relating to allowances.
- B. Section 01270 - Unit Prices: Monetary values of unit prices, payment and modification procedures relating to unit prices.
- C. Section 01780 - Closeout Submittals.

1.3 SCHEDULE OF VALUES

- A. Submit a printed schedule on AIA Form G703 - Application and Certificate for Payment Continuation Sheet or Architect approved similar.
- B. Submit Schedule of Values in duplicate within 15 days after of the Letter of Intent.
- C. Include in each line item, the amount of Allowances specified. For unit cost Allowances, identify quantities taken from Contract Documents multiplied by the unit cost to achieve the total for the item.
- D. Submit separate quantities and amounts for material and labor for each respective line item.
- E. Revise schedule to list approved Change Orders, with each Application For Payment.
- F. Support values given with data to substantiate their correctness.
- G. Submit quantities of designated materials.
- H. List quantities of materials specified under unit prices.
- I. Include in the line items a total amount of Contractor's overhead and profit.
- J. Payment for materials stored on or off site will be limited to those materials listed separately in Schedule of Values.
- K. Form of Submittal
 - 1. Submit typewritten Schedule of Values on 8-1/2 x 11 paper format.
 - 2. Utilize the Table of Contents of this Project Manual.
 - 3. Identify each line item with number and title of the specification Section.
 - 4. Separate costs under the various phases.
- L. Preparation
 - 1. Itemize separate line cost for each of following cost items:
 - a. Overhead and profit.
 - b. Bonds.
 - c. Insurance.
 - d. General Requirements.
 - e. Site mobilization.
 - 2. Itemize separate line item cost for work specified in each section of the specifications. Identify work of:
 - a. Contractor's own labor forces.
 - b. All subcontractors.
 - c. All major suppliers of products or equipment.
 - 3. Break down installed costs into:
 - a. Delivered cost of product, with taxes paid.
 - b. Labor cost.
 - 4. For each line item which has an installed value of more than \$10,000.00 break down costs to list amount of labor and amount of materials under each item.
 - a. Contractor, subcontractor or supplier.
 - b. Specification section number.
 - c. Description of work or material.
 - d. Quantity.
 - e. Unit Price.
 - f. Scheduled value.

SECTION 01200

PRICE AND PAYMENT PROCEDURES

- g. % of Contract.
- 5. Round off figures to nearest ten dollars.
- 6. Make sum of total costs of all items listed in Schedule equal to total contract sum.
- M. Review and Resubmittal
 - 1. After review by Architect, revise and resubmit Schedule as directed by Architect.
 - 2. Follow original submittal procedure.
- N. Update
 - 1. Update Schedule of Values when:
 - a. Change in cost occurs.
 - b. Change of subcontractor or supplier occurs.
 - c. Change of product or equipment occurs.
 - 2. Provide written justification for any changes requested by contractor.

1.4 APPLICATIONS FOR PROGRESS PAYMENTS

- A. Payment Period: Submit at intervals stipulated in the Agreement.
- B. Present required information in typewritten form.
- C. Form: AIA G702 Application and Certificate for Payment and AIA G703 - Continuation Sheet including continuation sheets when required or Architect approved equal.
- D. For each item, provide a column for listing each of the following:
 - 1. Item Number.
 - 2. Description of work.
 - 3. Scheduled Values.
 - 4. Previous Applications.
 - 5. Work in Place and Stored Materials under this Application.
 - 6. Authorized Change Orders.
 - 7. Total Completed and Stored to Date of Application.
 - 8. Percentage of Completion
 - 9. Balance to Finish.
 - 10. Retainage.
- E. Each item on the application for payment shall include retainage in the amount of 10% of the total work completed and stored to date of application. Upon reaching Substantial Completion, and with prior authorization of the Owner and the Architect, the retainage may be reduced to 5% for each item that is deemed substantially complete on the subsequent application for payment.
- F. Execute certification by signature of authorized officer.
- G. Use data from approved Schedule of Values. Provide dollar value in each column for each line item for portion of work performed and for stored Products
- H. List each authorized Change Order as a separate line item, for each respective subcontractor or material supplier listing Change Order number and dollar amount as for an original item of Work.
- I. Submit three pencil copies of each Application for Payment for review and approval by Architect and Owner.
- J. Revise Application and Certificate of payment as directed by Architect.
- K. Once pencil copy has been approved by Architect, send three copies along with supporting documentation to the corporate office of the Architect.
- L. Include the following with the application:
 - 1. Transmittal letter as specified for Submittals in Section 01300.
 - 2. Construction progress schedule, revised and current as specified in Section 01300.
 - 3. Current construction photographs specified in Section 01300.
 - 4. Partial release of liens from Contractor for current period.
 - a. Release of liens to be provided on forms approved by the Architect prior to the first payment being submitted.
 - 5. Partial release of liens from all Subcontractors and vendors from prior period.
 - a. Release of liens to be provided on forms approved by the Architect prior to the first payment being submitted.
 - 6. Affidavits attesting to off-site stored products, with original invoices. Statement of transfer of title upon payment and insurance coverage specifically identifying stored items.

SECTION 01200

PRICE AND PAYMENT PROCEDURES

- M. When Architect requires substantiating information, submit data justifying dollar amounts in question. Provide one copy of data with cover letter for each copy of submittal. Show application number and date, and line item by number and description.

1.5 CERTIFIED PAYROLL FOR PUBLIC WORKS PROJECTS

- A. As per the Prevailing Wage Act., all contractors and their subcontractors who are engaged in public works projects must provide a certified monthly payroll report to the Illinois Department of Labor.
- B. Each Contractor or Subcontractor performing Work on this Project shall comply in all respects with all laws governing the employment of Labor, Social Security, and Unemployment Insurance of both the State and Federal government. There shall be paid to each employee engaged in Work under this Contract at the site of the Project, no less than the minimum wage for the classifications of labor employed in compliance with 820 ILCS 130/1 et seq. as now existing or hereafter amended.
- C. In accordance with 820 ILCS 130/5, the Contractor and each subcontractor shall make and keep, for a period of not less than 3 years, records of all laborers, mechanics, and other workers employed by them on the Project; the records shall include each worker's name, address, telephone number, social security number, classification or classifications, the hourly wages paid in each period, the number of hours worked each day, and the starting and ending times of each work day.
- D. The Contractor and each subcontractor shall submit monthly to the Illinois Department of Labor. The certified payroll shall consist of a complete copy of the records and all certifications required by the Illinois Department of Labor.
- E. With each monthly application for payment to the Owner, the contractor shall provide written confirmation that the Certified Payroll report has been properly submitted to the Illinois Department of Labor for all Contractors and Sub-Contractors.
- F. Upon 2 business days notice, the contractor and each subcontractor shall make available for inspection for the records to the Owner, its officers and agents, and to the Director of Labor and his deputies and agents at all reasonable hours at a location within the State. The Contractor and each subcontractor shall permit his/her employees to be interviewed on the job, during working hours, by compliance investigators of the Department or the Department of Labor.

1.6 CHANGE ORDER PROCEDURES

- A. Promptly implement Change Order procedures.
 - 1. Provide full written data required to evaluate changes.
 - 2. Maintain detailed records of work done on time-and-material/force account basis.
 - 3. Provide full documentation to Architect.
- B. Designate in writing the member of Contractor's organization:
 - 1. Who is authorized to accept changes in Work.
 - 2. Who is responsible for informing others in Contractor's employ of authorization of changes in Work.
 - 3. If other than the Owner, the Owner will designate in writing the person(s) authorized to execute Change Orders.
- C. Initiation of Contract Changes:
 - 1. Requests for change by the Contractor shall be initiated in writing.
 - 2. Subcontractors initiating a request for change shall direct their requests to the Contractor.
 - 3. The Architect will review and direct the Contractor's requests for change to the Owner or Owner's Representative with recommendations.
 - 4. Requests for change affecting contract sum or contract completion shall be made prior to starting any changes to the construction work or purchasing of materials. Failure to make appropriate written requests will invalidate any claims for additional costs or time for said work.

SECTION 01200

PRICE AND PAYMENT PROCEDURES

- D. Owner Authorizes:
 - 1. The Owner or Owner's Representative, having considered the necessity of the requested change and availability of funds will authorize the Architect to prepare a request for proposal (RFP).
- E. Architect Prepares Request for Proposal:
 - 1. The Architect, following consultation with the Contractor regarding subcontracts which will be affected by the proposed change, will prepare a RFP for Contractor response.
 - 2. Two sets of the RFP and Supplemental Drawings and Specifications for each proposed change are transmitted to the Contractor.
- F. Contractors Prepare Proposals:
 - 1. Detailed Breakdown of Material Equipment and Labor:
 - a. The Contractor or Subcontractor whose work is affected by a proposed change shall prepare a proposal for change.
 - b. The detailed breakdown shall be prepared in accordance with the Contract Documents.
 - c. If a change affects work covered by agreed on prices, such prices shall be used as the basis for adjustments to the contract sum.
 - d. In all other cases, adjustments to the contract sum shall be based on the Contractor's direct cost, including costs of material, labor, equipment, bonds and taxes as applicable.
 - e. Labor rates shall be itemized on the detailed breakdown indicating the trade base wage rate, total union fringe benefits, FICA, unemployment compensation insurance and workmen's compensation insurance. Labor charges shall not include costs for inefficiencies of construction supervision or labor.
 - f. Change order adjustments to the contract developed above shall include amounts for overhead and profit which do not exceed average amounts indicated in the Schedule of Values, or an amount of 15%, whichever is less, and that no overhead and profit shall be deducted from the total price for changes reducing the cost of the contract. If the changed work is performed by a subcontractor, no more than 10% may be added to the subcontractor's costs for overhead and profit. An additional not to exceed 5% may be included for the Contractor's overhead and profit on all work provided directly by a subcontractor employed on the project.
- G. Contractor Reviews:
 - 1. Reviews: The Contractor shall review all proposals for:
 - a. Conformance with the RFP to ensure that all items and only those items of work affected by the proposed change are included.
 - b. Assurance that the proposals are submitted in conformance with the Contract Documents.
 - 2. Transmittal: The Contractor shall forward to the Architect three complete sets of proposals with its recommendation regarding the proposal.
 - a. In making recommendations, the Contractor shall certify that the price is appropriate and if it is not appropriate, shall state the reasons for not certifying the price.
 - b. Proposals, complete with all required information, shall be submitted to the Architect within three weeks of the date of the RFP in order to receive further consideration.
- H. Architect Reviews:
 - 1. The Architect reviews the Contractor's proposals for completeness and conformance with the RFP and Contract Documents. Proposals which are incomplete or have inadequate detailed breakdowns will be returned to the Contractors for resubmission.
 - 2. The Architect will review and, when appropriate, approve all price proposals recommending Owner approve issuance of a change order.
 - 3. When the Architect considers the costs or quantities to be inappropriate to the work requested, the Architect will notify the Contractor in writing of the concerns and the Contractor will provide the necessary backup materials to justify the submittal or modify the submittal.

SECTION 01200

PRICE AND PAYMENT PROCEDURES

4. Submittals not properly justified will not be forwarded to the Owner and written notice as to the reasons will be forwarded to the Contractor. After 30 days of said written notification and no further response by the Contractor, the request will be considered inappropriate and will receive no further consideration.
- I. Architect Issues Change Order:
 1. The Architect, having received what is believed to be an appropriate and acceptable Contractor proposal for the proposed change and having received Owner's approval to issue a change order, the Architect will issue a Change Order.
 2. The Change Order package prepared by the Architect for submittal to the Owner shall contain the following items:
 - a. Three originals of the Change Order form with appropriate original signatures, along with supporting documentation including, but not limited to:
 - 1) Request for Proposal with signatures.
 - 2) Pristine copy of drawings and specifications.
 - 3) On changes initiated by the Architect, a letter explaining the circumstances related to the need for the change.
 - 4) On Owner requested Change Orders, a letter of request signed by the Owner's Representative.
 - 5) Change Order Authorization Form for Owner's Signature and permanent record in accord with Public Act 85-1295. When required on public work--for changes greater than \$10,000.00 or 30 Days.
- J. Owner Approves or disapproves Change Order: For change in Contract Sum and/or Contract Time.
- K. One copy of approved Change Order with original signatures will be returned to the Contractor, or notice and explanation as to why it has been rejected will be forwarded to the Contractor.

1.7 APPLICATION FOR FINAL PAYMENT

- A. Submit all closeout documents and comply with all requirements as put forth in Section 01780 - Closeout Submittals.
- B. Once closeout submittal have been approved by Architect, prepare Application for Final Payment as specified for progress payments, identifying total adjusted Contract Sum, previous payments, and sum remaining due; including properly executed Consent of Surety.
- C. Application for Final Payment will not be considered until the following have been accomplished:
 1. All closeout procedures specified in Section 01780.

PART 2 – PRODUCTS – NOT USED

PART 3 – EXECUTION – NOT USED

END OF SECTION

SECTION 01210

ALLOWANCES

PART 1 – GENERAL

1.1 SECTION INCLUDES

- A. Cash allowances.
- B. Inspection and testing Allowances.
- C. Payment and modification procedures relating to allowances.

1.2 RELATED SECTIONS

- A. Section 01200 - Price and Payment Procedures: Additional payment and modification procedures.

1.3 SELECTION AND PURCHASE

- A. At the earliest practical date after award of the Contract, advise Architect of the date when final selection and purchase of each product or system described by an allowance must be completed to avoid delaying the Work.
- B. At Architect's request, obtain proposals for each allowance for use in making final selections. Include recommendations that are relevant to performing the Work.
- C. Purchase products and systems selected by Architect from the designated supplier.
- D. Any unused allowance funds will be credited back to Owner by Change Order prior to close out.

1.4 SUBMITTALS

- A. Submit proposals for purchase of products or systems included in allowances, in the form specified for Change Orders.
- B. Submit invoices or delivery slips to show actual quantities of materials delivered to the site for use in fulfillment of each allowance.
- C. Submit time sheets and other documentation to show labor time and cost for installation of allowance items that include installation as part of the allowance.
- D. Coordinate and process submittals for allowance items in same manner as for other portions of the Work.

1.5 COORDINATION

- A. Coordinate allowance items with other portions of the Work. Furnish templates as required to coordinate installation.
- B. Architect Responsibilities:
 - 1. Consult with Contractor for consideration and selection of products, suppliers, and installers.
 - 2. Select products in consultation with Owner and transmit decision to Contractor.
 - 3. Prepare Allowance Authorization.
- C. Contractor Responsibilities:
 - 1. Assist Architect in selection of products, suppliers, and installers.
 - 2. Obtain proposals from suppliers and installers and offer recommendations.
 - 3. On notification of which products have been selected, execute purchase agreement with designated supplier and installer.
 - 4. Arrange for and process shop drawings, product data, and samples. Arrange for delivery.

1.6 CASH ALLOWANCES

- A. Costs Included in cash allowances:
 - 1. Allowances shall cover the cost to the Contractor of materials and equipment delivered to the site and all required taxes, less applicable trade discounts.
 - 2. Contractor's costs for unloading and handling at the site, installation costs, overhead, profit and other expenses contemplated for stated allowance amounts shall be included in the Base Bid and not in the allowances.

SECTION 01210

ALLOWANCES

1.7 INSPECTION AND TESTING ALLOWANCES

- A. Costs Included in Inspecting and Testing Allowances: Cost of engaging the inspecting or testing agency of record; execution of inspecting and tests; and reporting results.
- B. Costs Not Included in the Inspecting and Testing Allowances:
 - 1. Costs of testing services used by Contractor separate from Contract Document requirements.
 - 2. Costs of testing services used by the Contractor from a source other than the testing agency of record.
 - 3. Costs of retesting upon failure of previous tests as determined by Architect.
 - 4. The allowance does not include incidental labor required to assist the testing agency or costs for retesting if previous tests and inspections result in failure. The cost for incidental labor to assist the testing agency shall be included in the Contract Sum.

PART 2 – PRODUCTS – NOT USED

PART 3 – EXECUTION

3.1 EXAMINATION

- A. Examine products covered by an allowance promptly on delivery for damage or defects. Return damaged or defective products to manufacturer for replacement.

3.2 PREPARATION

- A. Coordinate materials and their installation for each allowance with related materials and installations to ensure that each allowance item is completely integrated and interfaced with related work.

3.3 SCHEDULE OF ALLOWANCES

- A. Allowance No. 1: Cash Allowance: Include the stipulated sum/price of \$1,350,0000 for use upon Owner's instructions.
- B. Allowance No. 2: Inspection and Testing Allowance: Include the stipulated sum/price of \$150,000.00 for use upon Owner's instructions.

END OF SECTION

SECTION 01230

ALTERNATES

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Alternate submission procedures.
- B. Documentation of changes to Contract Sum and Contract Time.

1.2 RELATED SECTIONS

- A. Section 00100 – Instructions to Bidders: Instructions for preparation of pricing for alternatives.

1.3 ACCEPTANCE OF ALTERNATES

- A. Alternates quoted on Bid Forms will be reviewed and accepted or rejected at Owner's option. Immediately accepted alternates will be identified in the Owner-Contractor Agreement.
- B. The Owner may accept any Alternate within 90 days of the date of contract.
- C. State the amount of Alternates prices to be added or deducted from the Base Bid price on the Bid Form.
- D. Perform all portions of the work affected by this Section in accordance with the requirements of the Contract Documents.
- E. Comply with requirements relative to materials and workmanship contained in the respective specification sections.
- F. Coordinate related work and modify surrounding work to integrate the Work of each Alternate.

1.4 SCHEDULE OF ALTERNATES

Alternate No. 1: Early Childhood Wing

State the amount to be ADDED to the lump sum base bid if the early childhood wing and associated additional site work shown as Alternate #1 on the drawings is completed.

Alternate No. 2: Learning Stair

State the amount to be ADDED to the lump sum base bid if the learning stair and all associated items are provided. All Logos remains provide and paint below logo on east wall. Refer to Drawings A3.16 for more information.

Alternate No. 3: Early Childhood Playground

State the amount to be ADDED to the lump sum base bid if the east early childhood playground, fencing, surfacing and drainage are omitted. Provide seed and blanket.

Alternate No. 4: K-5 Playground

State the amount to be ADDED to the lump sum base bid if the west playground equipment, surfacing, curbs and drainage are omitted. Provide seed and blanket.

Alternate No.5: Removal of Baffles and Associated Linear Pendant Lighting

State the amount to be DEDUCTED from the lump sum base bid to provide 2x4 acoustical tile ceiling system (SAT-1) and (4) F8 light fixtures at (5) base bid locations as detailed on 1/A7.30 in lieu of Acoustical PET Baffle system, black 2x2 SAT ceiling and F2A light fixtures. Remove associated transition pieces between ceiling types.

Alternate No. 6: Removal (2) Masonry Planters

State the amount to be DEDUCTED from the lump sum base bid if the following (2) masonry planters and associated items are removed. Provide seed and blanket in removed footprint. Provide brick and stepped foundation on east wall of Garage where planter was removed.

1. Planter one in front of Garage 200G.
2. Planter two in front of Rooms 101-103.

SECTION 01230

ALTERNATES

Alternate No. 7: Vinyl Wall Covering

State the amount to be DEDUCTED from the lump sum base bid if (5) vinyl wall coverings (VF-1) as detailed in 1/A3.13 are removed and replaced with (1) painted accent color per pod/area.

Alternate No. 8: Tackboard and Markerboard Wall Coverings

State the amount to be DEDUCTED from the lump sum base bid if Claridge white porcelain enamel on steel markerboards with anodized natural frames and chalk and map rail and vinyl coated fabric with natural cork with hardboard backing Claridge tackboards with natural anodized, aluminum extruded frame with fasters are provided and installed in lieu of tackboard and markerboard wall covering (TB-1 and WC-1). Refer to floor plans and interior elevations for all locations. Sizes to closely match specified and walls on all sides of marker boards and tack board to be painted.

Alternate No. 9: Roof Stairs

State the amount to be DEDUCTED from the lump sum base bid if (3) Roof Stairs shown on Modules A, B and C are replaced with Roof Ladders Per Details 1/A8.32.

PART 2 – PRODUCTS – NOT USED

PART 3 – EXECUTION – NOT USED

END OF SECTION

SECTION 01270

UNIT PRICES

PART 1 – GENERAL

1.1 SECTION INCLUDES

- A. List of unit prices, for use in preparing Bids.
- B. Measurement and payment criteria applicable to Work performed under a unit price payment method.
- C. Defect assessment and non-payment for rejected work.

1.2 RELATED SECTIONS

- A. Unit prices listed on Bid Form

1.3 COSTS INCLUDED

- A. Unit Prices included on the Bid Form shall include full compensation for all required labor, products, tools, equipment, plant, transportation, services and incidentals; erection, application or installation of an item of the Work; overhead and profit.

1.4 APPLICATION

- A. Enter unit prices for each work item in Bid Form in space provided. Omission may result in rejection of bid.
- B. Contractor shall take all measurements and compute quantities. Measurements and quantities will be verified by field measurement or assessment.

1.5 UNIT QUANTITIES SPECIFIED

- A. Quantities indicated in the Bid Form are for bidding and contract purposes only. Quantities and measurements of actual Work will determine the payment amount.

1.6 MEASUREMENT OF QUANTITIES

- A. Measurement methods delineated in the individual specification sections complement the criteria of this section. In the event of conflict, the requirements of the individual specification section govern.
- B. Take all measurements and compute quantities. Measurements and quantities will be verified by Architect.
 - 1. Contractor shall provide necessary equipment, workers, and survey personnel as required at no additional cost to Owner.
- C. Measurement Devices:
 - 1. Weight Scales: Inspected, tested and certified by the applicable state Weights and Measures department within the past year.
 - 2. Platform Scales: Of sufficient size and capacity to accommodate the conveying vehicle.
 - 3. Metering Devices: Inspected, tested and certified by the applicable State department within the past year.
- D. Measurement by Weight: Concrete reinforcing steel, rolled or formed steel or other metal shapes will be measured by handbook weights. Welded assemblies will be measured by handbook or scale weight.
- E. Measurement by Volume: Measured by cubic dimension using mean length, width and height or thickness.
- F. Measurement by Area: Measured by square dimension using mean length and width or radius.
- G. Linear Measurement: Measured by linear dimension, at the item centerline or mean chord.
- H. Stipulated Sum/Price Measurement: Items measured by weight, volume, area, or linear means or combination, as appropriate, as a completed item or unit of the Work.
- I. Perform surveys required to determine quantities, including control surveys to establish measurement reference lines. Notify Architect prior to starting work.
- J. Contractor's Engineer Responsibilities: Sign surveyor's field notes or keep duplicate field notes, calculate and certify quantities for payment purposes.

SECTION 01270

UNIT PRICES

1.7 PAYMENT

- A. Payment for Work governed by unit prices will be made on the basis of the actual measurements and quantities of Work which is incorporated in or made necessary by the Work and accepted by the Architect, multiplied by the unit sum/price.
- B. Payment will not be made for any of the following:
 - 1. Products wasted or disposed of in a manner that is not acceptable.
 - 2. Products determined as unacceptable before or after placement.
 - 3. Products not completely unloaded from the transporting vehicle.
 - 4. Products placed beyond the lines and levels of the required Work.
 - 5. Products remaining on hand after completion of the Work.
 - 6. Loading, hauling, and disposing of rejected Products.

1.8 DEFECT ASSESSMENT

- A. Replace Work, or portions of the Work, not conforming to specified requirements.
- B. If, in the opinion of Owner, it is not practical to remove and replace the Work, Owner will direct one of the following remedies:
 - 1. The defective Work may remain, but the unit sum/price will be adjusted to a new sum/price at the discretion of Owner.
 - 2. The defective Work will be partially repaired to the instructions of the Owner, and the unit sum/price will be adjusted to a new sum/price at the discretion of Owner.
- C. The individual specification sections may modify these options or may identify a specific formula or percentage sum/price reduction.
- D. The authority of Architect to assess the defect and identify payment adjustment is final.

1.9 SCHEDULE OF UNIT PRICES

- A. Contractor shall include unit prices in Bid Form for specified item.
- B. Schedule:
 - 1. Structural Fill - CA-6 – per cubic yard.
 - 2. Graded Granular Fill - CA-6 – per cubic yard.
 - 3. Open Granular Fill - CA-7 – per cubic yard.
 - 4. Crushed Stone Aggregate base course – CA6 – per cubic yard.
 - 5. Concrete Fill - Lean Concrete – per cubic yard.
 - 6. Remove Unsuitable Material – per cubic yard.
 - 7. Asphalt paving – per square yard for standard duty section
 - 8. Soil Haul Off – per cubic yard

PART 2 – PRODUCTS – NOT USED

PART 3 – EXECUTION – NOT USED

END OF SECTION

SECTION 01300

ADMINISTRATIVE REQUIREMENTS

PART 1 – GENERAL

1.1 SECTION INCLUDES

- A. Preconstruction meeting.
- B. Site mobilization meeting.
- C. Progress meetings.
- D. Construction progress schedule.
- E. Progress photographs.
- F. Coordination drawings.
- G. Submittals for review, information, and project closeout.
- H. Number of copies of submittals.
- I. Submittal procedures.

1.2 RELATED SECTIONS

- A. Document 00700 - General Conditions: Dates for applications for payment.
- B. Section 01100 - Summary: Stages of the Work, Work covered by each contract, occupancy.
- C. Section 01200 - Price and Payment Procedures:
- D. Section 01325 - Construction Progress Schedule: Form, content, and administration of schedules.
- E. Section 01700 - Execution Requirements: Additional coordination requirements.
- F. Section 01780 - Closeout Submittals: Project record documents.

1.3 PROJECT COORDINATION

- A. Project Coordinator: Contractor.
- B. Cooperate with the Contractor in allocation of mobilization areas of site; for field offices and sheds, for access, traffic, and parking facilities.
- C. During construction, coordinate use of site and facilities through the Contractor.
- D. Comply with procedures for intra-project communications; submittals, reports and records, schedules, coordination drawings, and recommendations; and resolution of ambiguities and conflicts.
- E. Comply with instructions of the Contractor for use of temporary utilities and construction facilities.
 - 1. Direct and check-out of utilities, operational systems, and equipment.
 - 2. Record dates of start of operation of systems and equipment.
- F. Coordinate field engineering and layout work under instructions of the Contractor.
- G. Develop and implement procedure for review and processing of applications for progress and final payments: Submit recommendation to Architect for Certification to Owner for Payment.
- H. Establish on-site lines of authority and communication; schedule and conduct project meetings among:
 - 1. Owner's Representative.
 - 2. Architect.
 - 3. Subcontractors.
- I. Cost Control:
 - 1. Maintain cost accounting records for authorized work performed under Unit Costs.
 - 2. Develop and implement procedure for review and processing of applications for progress and final payments: Submit recommendation to Architect for Certification to Owner for Payment.
- J. Administer processing of:
 - 1. Shop drawings, product data and samples.
 - 2. Field drawings.
 - 3. Coordination drawings.
 - 4. Closeout submittals.
- K. Maintain Reports and Records at Job Site:
 - 1. Daily log of progress of work, available to Architect and Owner.
 - 2. Verify that all subcontractors maintain record documents on a current basis.

SECTION 01300

ADMINISTRATIVE REQUIREMENTS

3. At completion of Project, assemble record documents from all subcontractors and deliver to the Architect in accordance with Section 01780.
4. Assemble documentation for handling of claims and disputes.
- L. Contractor to verify that specified cleaning is done during progress of work and at the completion of each subcontractor's work.
- M. Make the following types of submittals to Architect through the Project Coordinator:
 1. Requests for interpretation.
 2. Requests for substitution.
 3. Shop drawings, product data, and samples.
 4. Submittals for information.
 5. Test and inspection reports.
 6. Design data.
 7. Manufacturer's instructions and field reports.
 8. Applications for payment and change order requests.
 9. Progress schedules.
 10. Coordination drawings.
 11. Closeout submittals.
- N. Upon contractor's determination of Substantial Completion of work or portion thereof, notify Architect in writing as to project status and request inspection and compilation of punch list of incomplete or unsatisfactory items.
- O. Upon Architect's Certification of Date of Substantial Completion, supervise correction and completion of work within specified period.
- P. Upon Contractor's determination that Work is finally complete:
 1. Submit written notice to Architect and Owner, that Work is ready for final inspection.
 2. Secure and transmit to Architect required closeout submittals as put forth in Section 01780.
- Q. Contractor to turn over to Architect for approval all items for closeout as put forth in Section 01780.

PART 2 - PRODUCTS - NOT USED

PART 3 – EXECUTION

3.1 PRECONSTRUCTION MEETING

- A. Architect will schedule a meeting within 10 days of date of Letter of Intent.
- B. Attendance Required:
 1. Owner.
 2. Architect.
 3. Contractor:
 4. Field Superintendent
 5. Project Manager
 6. Safety Representative.
 7. Contractor's Major Subcontractors.
- C. Minimum Agenda:
 1. Items required to be submitted by Contractor at Preconstruction Meeting:
 - a. Fully executed bonds and Insurance Certificates
 - b. List of major Subcontractors and suppliers.
 - c. Tentative construction schedule.
 - d. Letter from Project Safety Representative certifying that he/she will be empowered as the Contractor's Safety Engineer, is responsible for enforcing all safety requirements and is familiar with the Manual of Accident Prevention in Construction by the Associated General Contractors of America, current edition, and further that the Contractor will maintain at the project a copy of said publication and will strictly enforce the applicable requirements of same.

SECTION 01300

ADMINISTRATIVE REQUIREMENTS

2. Distribute and discuss documents required to be submitted by Contractor at Preconstruction meeting.
3. Execution of Owner-Contractor Agreement.
4. Identify critical work sequencing.
5. Discussion of schedule of values, and progress schedule.
6. Discussion of list of Subcontractors, list of Products, schedule of values, and progress schedule.
7. Designation of responsible personnel representing the parties to Contract; Owner, Architect and Contractor.
8. Establish chain of Authority.
9. Procedures and processing of field decisions, submittals, substitutions, applications for payments, proposal request, Change Orders, and Contract closeout procedures.
10. Scheduling.
 - a. Discuss major equipment deliveries and priorities.
11. Review of use of premises:
 - a. Office and storage areas.
 - b. Access to site and facilities.
12. Owner's requirements.
13. Security procedures.
14. Review requirements of and procedures for maintaining record documents.
15. Architect will record minutes and distribute copies within five days after meeting to participants, with copies to Contractor, Owner, participants, and those directly affected by decisions made.

3.2 SITE MOBILIZATION MEETING

- A. Contractor will schedule a meeting at the Project site prior to Contractor occupancy.
- B. Attendance Required:
 1. Contractor.
 2. Owner.
 3. Architect.
 4. Special Consultants.
 5. Contractor's Superintendent.
 6. Major Subcontractors.
 7. Safety Representative.
- C. Agenda:
 1. Use of premises by Owner and Contractor.
 2. Owner's requirements and occupancy prior to completion.
 3. Construction facilities and controls provided by Owner.
 4. Temporary utilities provided by Owner.
 5. Survey and building layout.
 6. Security and housekeeping procedures.
 7. Schedules.
 8. Application for payment procedures.
 9. Procedures for testing.
 10. Procedures for maintaining record documents.
 11. Requirements for start-up of equipment.
 12. Inspection and acceptance of equipment put into service during construction period.
 13. Establish safety and first aid procedures.
 14. Procedures and reviews of mock-up panels.
- D. Contractor will record minutes and distribute copies within five (5) days after meeting to participants, with two copies to Architect, Owner, participants, and those affected by decisions made.

SECTION 01300

ADMINISTRATIVE REQUIREMENTS

3.3 PROGRESS MEETINGS

- A. Contractor will schedule and administer meetings throughout progress of the Work at maximum bi-monthly intervals.
- B. Contractor will make arrangements for meetings, prepare agenda with copies for participants 5 business days in advance of meeting date, preside at meetings.
- C. Attendance Required: Job superintendent, major Subcontractors and suppliers, Owner, Architect, as appropriate to agenda topics for each meeting.
- D. Agenda:
 - 1. Review minutes of previous meetings.
 - 2. Review of Work progress.
 - 3. Field observations, problems, and decisions.
 - 4. Identification of problems which impede planned progress.
 - 5. Review of submittals schedule and status of submittals.
 - 6. Review of off-site fabrication and delivery schedules.
 - 7. Maintenance of progress schedule.
 - 8. Corrective measures to regain projected schedules.
 - 9. Planned progress during succeeding work period.
 - 10. Coordination of projected progress.
 - 11. Maintenance of quality and work standards.
 - 12. Effect of proposed changes on progress schedule and coordination.
 - 13. Other business relating to Work.
 - 14. Process Payment Requests Monthly.
- E. Contractor shall record minutes and distribute copies within Five (5) calendar days after meeting to participants, with two copies to Architect, Owner, participants, and those affected by decisions made.

3.4 CONSTRUCTION PROGRESS SCHEDULE - See Section 01325

3.5 PROGRESS PHOTOGRAPHS

- A. Provide photographs of site and construction throughout progress of Work produced by an experienced photographer, acceptable to Architect.
- B. Submit samples of Photographer's work on similar projects if required by Architects.
- C. Take photographs on the first day of each month and as follows:
 - 1. Site clearing.
 - 2. Excavations.
 - 3. Foundations.
 - 4. Structural framing.
 - 5. Enclosure of building.
 - 6. Final completion.
- D. Take photographs as evidence of existing project conditions.
- E. Views:
 - 1. Provide aerial photographs from four cardinal views at each specified time, until structure is enclosed.
 - 2. Provide non-aerial photographs from four cardinal views at each specified time, until Date of Substantial Completion.
 - 3. Consult with Architect for instructions on views required.
 - 4. Provide factual presentation.
 - 5. Provide correct exposure and focus, high resolution and sharpness, maximum depth of field, and minimum distortion.
- F. Prints: Digital.
 - 1. Identify name of Project, contract number, phase, orientation of view, date and time of view, name and address of photographer, and photographer's numbered identification.
- G. Deliver prints with each Application for Payment with transmittal letter specified in this Section.
- H. Deliver one set of prints each to Architect and Project record documents file.

SECTION 01300

ADMINISTRATIVE REQUIREMENTS

3.6 COORDINATION DRAWINGS

- A. Conduct coordination meetings in accordance with each respective section as work progresses. Contractor shall coordinate with Architect for such meetings.
- B. Provide information required by Contractor for preparation of coordination drawings.
- C. Review drawings prior to submission to Architect.

3.7 SUBMITTALS FOR REVIEW

- A. When the following are specified in individual sections, submit them for review:
 - 1. Product data.
 - 2. Shop drawings.
 - 3. Samples for selection.
 - 4. Samples for verification.
- B. Submit to Architect for review for the limited purpose of checking for conformance with information given and the design concept expressed in the contract documents.
- C. Samples will be reviewed only for aesthetic, color, or finish selection.
- D. After review, provide copies and distribute in accordance with SUBMITTAL PROCEDURES article below and for record documents purposes described in Section 01780 - CLOSEOUT SUBMITTALS.

3.8 SUBMITTALS FOR INFORMATION

- A. When the following are specified in individual sections, submit them for information:
 - 1. Design data.
 - 2. Certificates.
 - 3. Test reports.
 - 4. Inspection reports.
 - 5. Manufacturer's instructions.
 - 6. Manufacturer's field reports.
 - 7. Other types indicated.
- B. Submit for Architect's knowledge as contract administrator or for Owner.

3.9 SUBMITTALS FOR PROJECT CLOSEOUT

- A. When the following are specified in individual sections, submit them at project closeout:
 - 1. Project record documents.
 - 2. Operation and maintenance data.
 - 3. Warranties.
 - 4. Bonds.
 - 5. Lien Waivers.
 - 6. Other types as indicated.
- B. Submit for Owner's benefit during and after project completion.

3.10 NUMBER OF COPIES OF SUBMITTALS

- A. Documents for Review or for information:
 - 1. The Contractor has the option of providing Submittals for review or for information either as a hard copy or electronically as outlined below.
 - 2. If Submittal is provided as a hard copy:
 - a. Submit the number of copies which the Contractor requires, plus three copies which will be retained by the Architect.
 - 3. If Submittal is provided electronically:
 - a. Deliver one copy of submittal to Architect via email or Compact Disc in PDF file format.
 - b. At Architect's discretion, the reviewed submittal, with any corrections, will be returned as one electronic copy in PDF format, or as one hard copy delivered to the Contractor.
- B. Documents for Project Closeout: Shall be submitted as hard copies only. Make one reproduction of submittal originally reviewed. Submit one extra of submittals for information.
- C. Samples: Submit the number specified in individual specification sections; one of which will be retained by Architect.

SECTION 01300

ADMINISTRATIVE REQUIREMENTS

1. After review, produce duplicates.
2. Retained samples will not be returned to Contractor unless specifically so stated.

3.11 SUBMITTAL PROCEDURES

- A. Sequentially number the transmittal form and clearly indicate the respective specification section number for reference. Revise submittals with original number and a sequential alphabetic suffix.
- B. Identify Project, Contractor, Subcontractor or supplier; pertinent drawing and detail number, and specification section number, as appropriate on each copy.
- C. Apply Contractor's stamp, signed or initialed certifying that review, approval, verification of Products required, field dimensions, adjacent construction Work, and coordination of information is in accordance with the requirements of the Work and Contract Documents.
- D. Deliver submittals to Architect at business address or via email.
- E. Schedule submittals to expedite the Project, and coordinate submission of related items.
- F. For each submittal for review, allow 10 days excluding delivery time to and from the Contractor.
- G. Identify variations from Contract Documents and Product or system limitations which may be detrimental to successful performance of the completed Work.
- H. Provide space for Contractor and Architect review stamps.
- I. Shop drawings which incorporate, in part or in whole, direct reproductions of the contract documents, are not acceptable and will be returned, without review, to the contractor, for resubmittal.
- J. All shop drawings which are poorly prepared or handwritten will be returned, without review, to the contractor for resubmittal. Architect's determination of properly prepared shop drawings is final.
- K. Electronic Media/Files
 1. Construction drawings for this project have been prepared by the Architect and Engineer utilizing the following Computer Aided Drawing (CAD) System: Auto Cad Release 2015.
 2. Contractors and Subcontractors may purchase electronic media files of the Contract Documents.
 3. Upon request to purchase electronic media or files, the Contractor shall complete the "Request for Electronic Drawing Files" issued by the Architect and issue the appropriate fee to the Architect.
 4. Sheets can be formatted to provide background information only, background plus various layers of equipment; or of complete sheets as issued for construction.
 5. The Contractor may utilize these CAD Drawings in the preparation of their Shop Drawings and as built drawings only.
 6. The information issued is provided in a good faith effort to expedite the Project and simplify the efforts of the Contractor with no guarantee by the issuer as to the accuracy or correctness of the information provided. The Architect accepts no responsibility or liability for the Contractor's or subcontractor's use of these CAD documents.
 7. The use of these CAD documents by the Contractor(s) does not relieve them of their responsibility to field measure existing conditions and to properly fit the work to the Project.
 8. These documents will be provided when purchased for the convenience of the Contractor and this Project. Ownership and use of the issued documents are governed by the terms of the General Conditions.
- L. Submittals
 1. **Submit all submittals within 21 calendar days after date of Letter of Intent.** Failure to do so may cause scheduled contractor payments to be withheld.
 2. **Submit all manufacturer's letter's confirming prompt ordering of all material and equipment within 21 calendar days after date of Letter of Intent.** Failure to do so may cause scheduled contractor payments to be withheld. Confirmation Letters are to include the following:
 - a. Order date.
 - b. Manufacturing date.
 - c. Delivery date.

SECTION 01300

ADMINISTRATIVE REQUIREMENTS

- d. Confirmation that no factors will deter delivery on schedule.
 - e. Any other pertinent information.
 3. Submit four prints of shop drawings, and number of copies of product data and samples which Contractor requires for distribution and future submission under Section 01700 plus one copy which will be retained by Architect.
 4. Submit number of samples specified in each of specification sections.
 5. Accompany submittals with transmittal letter, in duplicate, containing:
 - a. Date.
 - b. Project title and number.
 - c. Contractor's name and address.
 - d. Relevant Specification section number.
 - e. The number of shop drawings, product data and samples submitted.
 - f. Notification of any deviations from Contract Documents.
 - g. Other pertinent data.
 6. Submittals shall include:
 - a. Date and revision dates.
 - b. Project title and number.
 - c. Names of:
 - 1) Architect
 - 2) Architect's consultant(s)
 - 3) Subcontractor
 - 4) Sub-subcontractor.
 - 5) Supplier.
 - 6) Manufacturer.
 - 7) Separate detailer when pertinent.
 - d. Identification of product or material.
 - e. Relation to adjacent structure or material.
 - f. Field dimensions, clearly identified as such.
 - g. Specification section and page number.
 - h. Specified standards, such as ASTM number or Federal Specification.
 - i. A blank space, 4" x 6" for Architect's stamp.
 - j. Identification of previously approved deviation(s) from Contract Documents.
 - k. Identification of color selections required and color selection charts.
 7. All shop drawing submittals received by the Architect which do not bear the contractor's approval stamp and initials or signatures will be returned, without review, to the contractor, for resubmittal.
 8. All shop drawing submittals which do not contain a reproducible transparency set of the submittal will be returned without review, to the contractor, for resubmittal.
- M. Resubmission Requirements
1. Shop Drawings:
 - a. Definition: Shop Drawings are original drawings prepared by Contractor, subcontractor, sub-subcontractor, supplier, or distributor, which illustrates some portion of the work, showing fabrication, layout, setting or erection details.
 - b. Revise initial drawings as directed and resubmit in accordance with submittal procedures.
 - c. Indicate on drawings all changes which have been made in addition to those requested by Architect.
 - d. Clearly indicate by revision number and date, each resubmittal of each shop drawing.
 - e. When revised for resubmission, identify all changes made since previous submission.
 - f. Shop drawings which incorporate, in part or in whole, direct reproductions of the contract documents, will NOT be accepted and will be returned without review.
 2. Product data and samples: Submit new data and samples as specified for initial submittal.
 3. Make all resubmittals within 10 business days after date of Architect's previous review.

SECTION 01300

ADMINISTRATIVE REQUIREMENTS

- N. Distribution of Submittals After Review
 - 1. Contractor will distribute copies of shop drawings and product data which carry Architect's stamp to:
 - a. Contractor's file.
 - b. Job site file.
 - c. Record documents file.
 - d. Subcontractors.
 - e. Suppliers.
 - f. Fabricators.
 - g. Other contractors as required.
 - 2. Distribute samples as directed in accordance with Contract Documents.
 - 3. Distribute copies of reviewed submittals as appropriate. Instruct parties to promptly report any inability to comply with requirements.
- O. Contractor Responsibilities
 - 1. Review shop drawings, product data and samples prior to submission to the next level of authority.
 - 2. Verify:
 - a. Field dimensions and drawing dimensions.
 - b. Field construction criteria.
 - c. Catalog numbers and similar data.
 - d. Compliance of items submitted with Contract Documents.
 - e. Dimensions and elevations requirements necessary to properly install product.
 - 3. Coordinate each submittal with requirements of:
 - a. The Work.
 - b. The Contract Documents.
 - c. The work of other subcontractors.
 - 4. Contractor's responsibility for errors and omissions in submittals is not relieved by Architect/Engineer's review of submittals.
 - 5. Notify Architect in writing prior to submission and specifically on the submittal, of proposed deviations in submittals from contract requirements.
 - 6. Contractor's responsibility for notifying Architect of deviations and for correcting deviations not properly identified in submittals is not relieved by Architect's review of improperly documented submittals.
 - 7. Do not begin any work which requires submittals without having Architect's stamp and initials or signature indicating review.
 - 8. After Architect's review, make response required by Architect's stamp and distribute copies. Indicate by transmittal that copy of approved data has been distributed.
 - 9. Subcontractors:
 - a. Subcontractors send their submittals to the Contractor.
 - b. Contractor reviews and initials submittals for compliance with scope, coordination and integration with the work of all other subcontractors.
 - c. Contractor transmits his reviewed copies of subcontractor's submittals to Architect.
 - d. Contractor retains copy of submittals after review by Architect and distributes copies to submitting subcontractor and to other subcontractors for coordination and integration.
 - e. Contractor: Enforce resubmission requirements.

SECTION 01300

ADMINISTRATIVE REQUIREMENTS

- P. Architect's Duties
 1. Review submittals within 10 business days.
 2. Review for compliance to design concept of project.
 3. Review all requests for proposed deviations. Obtain Owner's concurrence and respond to Contractor's request.
 4. Review of separate item does not constitute review of an assembly in which item functions.
 5. Affix stamp, date, and initials or signature certifying to review of submittal, and with instructions for contractor response.
 6. Return submittals to Contractor for response or distribution.
 7. Select product colors upon receipt of all shop drawings and submittals requiring color selections.
- Q. Submittals not requested will not be recognized or processed.

END OF SECTION

SECTION 01315

MECHANICAL AND ELECTRICAL COORDINATOR

PART 1 – GENERAL

1.1 SECTION INCLUDES

- A. Services of a mechanical and electrical coordinator.
- B. Coordination documents.

1.2 RELATED SECTIONS

- A. Section 01100 - Summary: Responsibilities of separate contractors.
- B. Section 01300 - Administrative Requirements: Additional requirements for coordination.
- C. Section 01600 - Product Requirements: Spare parts and maintenance materials.
- D. Section 01700 - Execution Requirements: Starting of Systems. Systems Demonstration.
- E. Section 01780 - Closeout Submittals: Project record documents.

1.3 REFERENCES

- A. See individual sections in Division 15 and 16.
- B. Equipment, devices, systems, workmanship, shall be entirely suitable and safe for each respective application and shall be in full compliance with all specified standards and laws of state and utility companies.
- C. Where laws so require, written approval shall be obtained for system from proper authorities before ordering equipment.

1.4 MECHANICAL AND ELECTRICAL COORDINATOR

- A. Employ and pay for services of a person, technically qualified and administratively experienced in field coordination for the type of mechanical and electrical work required for this Project, for the duration of the Work.
- B. Contractor shall act as coordinator of General, Plumbing, Heating, Ventilating, Air Conditioning, Fire Protection, and Electrical Sub-contract Work for the duration of construction.

1.5 SUBMITTALS

- A. Submit name, address, and telephone number of Contractor and name of principal officer for review.
- B. Submit coordination drawings and schedules prior to submitting shop drawings, product data, and samples.

PART 2 – PRODUCTS – NOT USED

PART 3 – EXECUTION

3.1 COORDINATION REQUIRED

- A. Coordinate work of Divisions 2 with each other and with work of other divisions.
- B. Coordinate progress schedules, including dates for submittals and for delivery of Products.
- C. Conduct meetings among Subcontractors and others concerned with the Work, to establish and maintain coordination and schedules, and to resolve coordination matters in dispute.
- D. Participate in progress meetings. Report on progress of Work to be adjusted under coordination requirements, and any required changes in schedules. Transmit minutes of meetings and reports to concerned parties.
- E. Each subcontractor shall be responsible for all of their work fitting into place in a neat and concise manner in accordance with the specifications and intent of the drawings and to the approval of the Architect.
- F. Confer with other subcontractors regarding the location and size of pipes, equipment, fixtures, conduit, ducts, openings, switches, outlets, and other mechanical and electrical items, so that there shall be no interferences between the installation and the progress of the work of any contractor on the project.

SECTION 01315

MECHANICAL AND ELECTRICAL COORDINATOR

- G. References to contractors in specifications and drawings include respective subcontractors.

3.2 COORDINATION DRAWINGS

- A. Prepare coordination drawings to organize installation of Products for efficient use of available space, for proper sequence of installation, and to identify potential conflicts.
- B. Prepare a master schedule to identify responsibilities under each section of Divisions 1 through 17 of the Project Manual for activities which directly relate to this work, including submittals and temporary utilities.
- C. Identify electrical power characteristics and control wiring required for each item of equipment.
- D. Maintain documents for the duration of the Work, recording changes due to site instructions, modifications or adjustments.
- E. The Mechanical and Electrical drawings are diagrammatic and shall be followed as closely as actual construction of the building and the work of other contractors will permit. Make minor changes from drawings to make the work of each contractor conform to general building construction and the work of other contractors.
- F. After Architect review of original and revised documents, reproduce and distribute copies to concerned parties.

3.3 COORDINATION OF SUBMITTALS

- A. Review Shop Drawings, Product Data, and Samples for compliance with Contract Documents and for coordination with work of the Project Manual. Transmit for review, copy reviewed documents to Architect.
- B. A copy of all submittals that include information pertinent to another subcontractor shall be submitted to them for review and information.
- C. Check field dimensions and clearances and relationship to available space and anchors.
- D. Check compatibility with equipment and Work of other sections, electrical characteristics, and operational control requirements.
- E. Check motor voltages and control characteristics.
- F. Coordinate controls, interlocks, wiring of pneumatic switches, and relays.
- G. Coordinate wiring and control diagrams.
- H. Review the effect of any changes on work of other sections.
- I. Verify information and coordinate maintenance of record documents.

3.4 COORDINATION OF SUBSTITUTIONS AND MODIFICATIONS

- A. Review proposals and requests for substitution prior to submission to Architect.
- B. Verify compliance with Contract Documents and for compatibility with Work and Products of other sections.
- C. Submit with recommendation for action.
- D. Space Preference:
 - 1. Carefully verify and coordinate the location and level of conduit, pipes, and ducts. Preliminary levels shall be run and verified with other subcontractors so that conflicts may be avoided. Where conflicts occur the following preference schedule shall be followed:
 - a. Recessed Electrical Fixtures.
 - b. Storm Drainage.
 - c. Sprinkler Piping.
 - d. High Pressure Ductwork
 - e. Sanitary Drainage
 - f. Hot and Chilled Water.
 - g. Low Pressure Ductwork.
 - h. Domestic Water, Storm, and Vent Lines.
 - i. Electrical Conduits.
- E. No other work shall have preference over plumbing lines below plumbing fixtures or electrical work above or below switchgear and electrical panels.
- F. No piping conveying fluids shall be installed directly over electrical equipment or through elevator shafts.

SECTION 01315

MECHANICAL AND ELECTRICAL COORDINATOR

- G. Change in equipment:
 - 1. When a change in specified or scheduled equipment including sizes shown, is made or directed for any reason, the contractor making the change shall be responsible for generating coordination drawings showing the new layout of all equipment, indicating required clearances, connection points, and the rerouting of piping, ductwork and conduit.
 - 2. The contractor making the change shall pay for all costs incurred by the other contractors to make the changes.
- H. Equipment requiring more than one type of connection, service or subcontractor to install it:
 - 1. Whenever a piece of equipment is to be supplied by one contractor, but various connections to the equipment must be made by other contractors, the contractor supplying the equipment shall consult with the other contractors before ordering this equipment.
 - 2. Opening size and location for access to any mechanical or electrical equipment, or the placement, maintenance or removal of that equipment shall be coordinated between contractors.

3.5 OBSERVATION OF WORK

- A. Observe Work for compliance with Contract Documents.
- B. Maintain a list of observed deficiencies and defects; promptly submit.
- C. Unless explicitly stated to the contrary, each Contractor shall provide each item of equipment or material hereinafter specified, complete with all fittings, supports, trim, piping, and insulation for a complete and properly operating installation.
- D. Equipment and materials shall be installed according to the manufacturer's instructions unless otherwise specifically directed by the Contract Documents.
- E. Wiring of Mechanical Equipment and Motors
 - 1. Unless otherwise specified the Electrical contractor shall provide conduits, wiring, disconnects, starters, thermal overload heaters, holding coils, remote pushbutton stations and pilot lights for all electrically operated mechanical equipment including final connections to the equipment and as hereinafter specified leaving the equipment ready for operation.
 - 2. Where starters or control panels come as an integral part of the respective equipment, the Electrical contractor shall furnish and install a disconnect switch and make final connections to the line side of the starter. Wiring beyond this point shall be by the contractor or equipment manufacturer furnishing the equipment unless otherwise shown on the electrical drawings.
 - 3. Each respective Mechanical contractor shall provide conduit and wiring for all automatic control devices from the holding coils of the starter or the ungrounded load side of manual motor starters, except remote pushbutton stations, and pilot lights. All work shall be in accordance with Division 16.
 - 4. Each contractor shall consult with the Electrical Contractor before ordering or installing equipment to coordinate the motor type, voltage and size with the starter type, holding coil voltage, thermal overload capacities, interlocks and shall be responsible to insure that the equipment installed is of proper size and type.
 - 5. After wiring is completed by the Electrical contractor, each equipment contractor shall inspect the wiring before motors are operated. When discrepancies are discovered, notify the Electrical contractor in writing of the discrepancies. After changes are complete the contractor who furnished the motor shall be completely responsible for motor protection during the warranty period including initial startup of each motor. Electrical contractor shall be responsible for the correct rotation, supply voltage and grounding of motors.
- F. Grounding: Electrically operated equipment shall be grounded in accordance with Division 16.

3.6 DOCUMENTATION

- A. Observe and maintain a record of tests. Record:
 - 1. Specification section number and product name.
 - 2. Name of Contractor, Subcontractor.
 - 3. Name of testing agency and name of inspector.
 - 4. Name of manufacturer's representative present.

SECTION 01315

MECHANICAL AND ELECTRICAL COORDINATOR

5. Date, time, and duration of tests.
 6. Type of test, and results.
 7. Retesting required.
- B. Assemble background documentation for dispute and claim settlement.
 - C. Submit copies of documentation to Architect upon request.

3.7 EQUIPMENT START-UP

- A. Verify utilities, connections, and controls are complete and equipment is in operable condition as required by Section 01700.
- B. Observe start-up and adjustments, test run, record time and date of start-up, and results.
- C. Observe equipment demonstrations to Owner; record times and additional information required for operation and maintenance manuals.

3.8 INSPECTION AND ACCEPTANCE OF EQUIPMENT

- A. Prior to inspection, verify that equipment is tested, operational, clean, and ready for operation.
- B. Assist Architect with review. Prepare list of items to be completed and corrected.
- C.

END OF SECTION

SECTION 01325

CONSTRUCTION PROGRESS SCHEDULE

PART 1 – GENERAL

1.1 SECTION INCLUDES

- A. Preliminary schedule.
- B. Construction progress schedule, bar chart type.

1.2 RELATED SECTIONS

- A. Section 01100 - Summary: Work sequence.

1.3 REFERENCES

- A. AGC (CPM) - The Use of CPM in Construction - A Manual for General Contractors and the Construction Industry; Associated General Contractors of America; 1976.

1.4 PRECONSTRUCTION MEETING

- A. Within 10 days after date of Agreement, submit preliminary schedule defining planned operations for the first 90 days of Work, with a general outline for remainder of Work
- B. If preliminary schedule requires revision after review, submit revised schedule within 10 days.
- C. Within 20 days after review of preliminary schedule, submit draft of proposed complete schedule for review.
 - 1. Include written certification that major contractors have reviewed and accepted proposed schedule.
 - a. Within 10 days after joint review, submit complete schedule.
- D. Submit updated schedule every 30 days or as requested by Architect.
- E. Submit the number of opaque reproductions that Contractor requires, plus one copy which will be retained by Architect and Owner. Furnish additional copies when directed.
- F. Submit under transmittal letter form specified in Section 01300.

1.5 QUALITY ASSURANCE

- A. Scheduler: Contractor's personnel or specialist Consultant specializing in CPM scheduling with five years minimum experience in scheduling construction work of a complexity comparable to this Project, and having use of computer facilities capable of delivering a detailed graphic printout within 48 hours of request.

1.6 SCHEDULE FORMAT

- A. Listings: In chronological order according to the start date for each activity. Identify each activity with the applicable specification section number.
- B. Diagram Sheet Size: Maximum 11x17 inches or width required.
- C. Sheet Size: Minimum of 8-1/2 x 11 inches, Maximum of 24" x 36".
- D. Scale and Spacing: To allow for notations and revisions.

1.7 START OF CONSTRUCTION SERVICES

- A. Construction services as specified herein shall commence upon issuance of the Letter of Intent to Award a Construction Contract.

PART 2 – PRODUCTS - NOT USED

PART 3 – EXECUTION

3.1 PRELIMINARY SCHEDULE

- A. Prepare (preliminary) schedule in the form of a horizontal bar chart.

SECTION 01325

CONSTRUCTION PROGRESS SCHEDULE

3.2 CONTENT

- A. Show complete sequence of construction by activity, with dates for beginning and completion of each element of construction.
- B. Identify each item by specification section number.
- C. Identify work of separate stages and other logically grouped activities.
- D. Provide sub-schedules for each stage of Work identified in Section 01100.
- E. Provide sub-schedules to define critical portions of the entire schedule.
- F. Include conferences and meetings in schedule.
- G. Show accumulated percentage of completion of each item, and total percentage of Work completed, as of the first day of each month.
- H. Provide separate schedule of submittal dates for shop drawings, product data, and samples, owner-furnished products, Products identified under Allowances, and dates reviewed submittals will be required from Architect. Indicate decision dates for selection of finishes.
- I. Indicate delivery dates for owner-furnished products.
- J. Coordinate content with schedule of values specified in Section 01200.
- K. Provide legend for symbols and abbreviations used.

3.3 BAR CHARTS

- A. Include a separate bar for each major portion of Work or operation.
- B. Identify the first work day of each week.

3.4 NETWORK ANALYSIS

- A. Prepare network analysis diagrams and supporting mathematical analyses using the Critical Path Method.
- B. Illustrate order and interdependence of activities and sequence of work; how start of a given activity depends on completion of preceding activities, and how completion of the activity may restrain start of subsequent activities.
- C. Mathematical Analysis: Tabulate each activity of detailed network diagrams, using calendar dates, and identify for each activity:
 1. Preceding and following event numbers.
 2. Activity description.
 3. Estimated duration of activity, in maximum 15 day intervals.
 4. Earliest start date.
 5. Earliest finish date.
 6. Actual start date.
 7. Actual finish date.
 8. Latest start date.
 9. Latest finish date.
 10. Total and free float; float time shall accrue to Owner and to Owner's benefit.
 11. Monetary value of activity, keyed to Schedule of Values.
 12. Percentage of activity completed.
 13. Responsibility.
- D. Analysis Program: Capable of compiling monetary value of completed and partially completed activities, accepting revised completion dates, and re-computation of all dates and float.
- E. Required Reports: List activities in sorts or groups:
 1. By preceding work item or event number from lowest to highest.
 2. By amount of float, then in order of early start.
 3. By responsibility in order of earliest possible start date.
 4. In order of latest allowable start dates.
 5. In order of latest allowable finish dates.
 6. Contractor's periodic payment request sorted by Schedule of Values listings.
 7. Listing of basic input data which generates the report.
 8. Listing of activities on the critical path.

SECTION 01325

CONSTRUCTION PROGRESS SCHEDULE

3.5 REVIEW AND EVALUATION OF SCHEDULE

- A. Participate in joint review and evaluation of schedule with Architect at each submittal.
- B. Evaluate project status to determine work behind schedule and work ahead of schedule.
- C. After review, revise as necessary as result of review, and resubmit within 5 days.

3.6 UPDATING SCHEDULE

- A. Maintain schedules to record actual start and finish dates of completed activities.
- B. Indicate progress of each activity to date of revision, with projected completion date of each activity.
- C. Annotate diagrams to graphically depict current status of Work.
- D. Identify activities modified since previous submittal, major changes in Work, and other identifiable changes.
- E. Indicate changes required to maintain Date of Substantial Completion.
- F. Submit reports required to support recommended changes.
- G. Provide narrative report to define problem areas, anticipated delays, and impact on the schedule. Report corrective action taken or proposed and its effect including the effects of changes on schedules of separate contractors.

3.7 DISTRIBUTION OF SCHEDULE

- A. Distribute copies of updated schedules to Contractor's project site file, to Subcontractors, suppliers, Architect, Owner, and other concerned parties.
- B. Instruct recipients to promptly report, in writing, problems anticipated by projections shown in schedules.

END OF SECTION

SECTION 01400

QUALITY REQUIREMENTS

PART 1 – GENERAL

1.1 SECTION INCLUDES

- A. References and standards.
- B. Quality assurance submittals.
- C. Mock-ups.
- D. Control of installation.
- E. Tolerances.
- F. Testing and Inspection Agencies.
- G. Manufacturers' field services.

1.2 RELATED SECTIONS

- A. Section 01210 - Allowances: Allowance for payment of testing services.
- B. Section 01300 - Administrative Requirements: Submittal procedures.
- C. Section 01600 - Product Requirements: Requirements for material and product quality.

1.3 SUBMITTALS

- A. Design Data: Submit for Architect's knowledge as contract administrator or for the Owner, for information for the limited purpose of assessing conformance with information given and the design concept expressed in the contract documents.
- B. Test Reports: After each test/inspection, promptly submit five copies of report to Architect and to Contractor.
 - 1. Include:
 - a. Date issued.
 - b. Project title and number.
 - c. Testing laboratory name and address.
 - d. Name and signature of inspector.
 - e. Date and time of sampling or inspection.
 - f. Record of temperature and weather.
 - g. Identification of product and specifications section.
 - h. Location in the Project.
 - i. Type of test/inspection.
 - j. Date of test/inspection.
 - k. Results of test/inspection.
 - l. Conformance with Contract Documents.
 - m. When requested by Architect, provide interpretation of results.
 - 2. Test reports are submitted for Architect's knowledge as contract administrator or for the Owner, for information for the limited purpose of assessing conformance with information given and the design concept expressed in the contract documents.
- C. Certificates: When specified in individual specification sections, submit certification by the manufacturer and Contractor or installation/application subcontractor to Architect, in quantities specified for Product Data.
 - 1. Indicate material or product conforms to or exceeds specified requirements. Submit supporting reference data, affidavits, and certifications as appropriate.
 - 2. Certificates may be recent or previous test results on material or product, but must be acceptable to Architect.
- D. Manufacturer's Instructions: When specified in individual specification sections, submit printed instructions for delivery, storage, assembly, installation, start-up, adjusting, and finishing, for the Owner's information. Indicate special procedures, perimeter conditions requiring special attention, and special environmental criteria required for application or installation.
- E. Manufacturer's Field Reports: Submit reports for Architect's benefit as contract administrator or for Owner.
 - 1. Submit report in duplicate within 30 days of observation to Architect for information.
 - 2. Submit for information for the limited purpose of assessing conformance with information given and the design concept expressed in the contract documents.

SECTION 01400

QUALITY REQUIREMENTS

- F. Erection Drawings: Submit drawings for Architect's benefit as contract administrator or for Owner.
 - 1. Submit for information for the limited purpose of assessing conformance with information given and the design concept expressed in the contract documents.
 - 2. Data indicating inappropriate or unacceptable Work may be subject to action by Architect or Owner.

1.4 REFERENCES AND STANDARDS - See Section 01425

1.5 TESTING AND INSPECTION AGENCIES

- A. Contractor will employ and pay for services, from Testing Allowances, of an independent testing agency to perform specified testing and inspection.
- B. Testing Agency of record: The Testing Agency of Record shall be identified by the Owner within 15 days of the Letter of Intent.
- C. Employment of agency in no way relieves Contractor of obligation to perform Work in accordance with requirements of Contract Documents.
- D. Inspection sampling and testing is required for:
 - 1. Section: 02310; Grading.
 - 2. Section: 02315; Excavation.
 - 3. Section: 02316; Fill and Backfill.
 - 4. Bituminous Concrete Paving.
 - 5. Portland Cement Concrete Paving.
 - 6. Section: 03200; Concrete Reinforcement.
 - 7. Section: 03300; Cast-in-Place Concrete.
 - 8. Section: 04065; Mortar and Masonry Grout.
 - 9. Section: 05120; Structural Steel.
 - 10. Section: 05310; Steel Joists
- E. Additional services as requested by Architect
- F. Testing Agency:
 - 1. Testing agency: Comply with requirements of ASTM E 329, ASTM E 548, ASTM E 543, ASTM C 1021, ASTM C 1077, ASTM C 1093, and ASTM C 1021.
 - 2. Inspection agency: Comply with requirements of ASTM D290.
 - 3. Laboratory: Authorized to operate in State in which Project is located.
 - 4. Laboratory Staff: Maintain a full time registered Engineer on staff to review services.
 - 5. Testing Equipment: Calibrated at reasonable intervals with devices of accuracy traceable to either National Bureau of Standards or accepted values of natural physical constants.

PART 2 – PRODUCTS – NOT USED

PART 3 – EXECUTION

3.1 CONTRACTOR CONTROL OF INSTALLATION

- A. Monitor quality control over suppliers, manufacturers, products, services, site conditions, and workmanship, to produce Work of specified quality.
- B. Comply with manufacturers' instructions, including each step in sequence.
- C. Should manufacturers' instructions conflict with Contract Documents, request clarification from Architect before proceeding.
- D. Comply with specified standards as minimum quality for the Work except where more stringent tolerances, codes, or specified requirements indicate higher standards or more precise workmanship.
- E. Have Work performed by persons qualified to produce required and specified quality.
- F. Verify that field measurements are as indicated on shop drawings or as instructed by the manufacturer.

SECTION 01400

QUALITY REQUIREMENTS

- G. Secure products in place with positive anchorage devices designed and sized to withstand stresses, vibration, physical distortion, and disfigurement.

3.2 MOCK-UPS

- A. Tests will be performed under provisions identified in this section and identified in the respective product specification sections.
- B. Assemble and erect specified items with specified attachment and anchorage devices, flashings, seals, accessories and finishes.
- C. Accepted mock-ups shall be a comparison standard for the remaining Work.
- D. Where mock-up has been accepted by Architect and is specified in product specification sections to be removed, remove mock-up and clear area when directed to do so.

3.3 TOLERANCES

- A. Monitor fabrication and installation tolerance control of products to produce acceptable Work. Do not permit tolerances to accumulate.
- B. Comply with manufacturer's tolerances. Should manufacturer's tolerances conflict with Contract Documents, request clarification from Architect before proceeding.
- C. Where specified tolerances within individual sections exceed those accepted by the Manufacturer, comply with the more stringent tolerances specified.
- D. Adjust products to appropriate dimensions; position before securing products in place.

3.4 TESTING AND INSPECTION

- A. See individual specification sections for testing and inspection required.
- B. Testing Agency Duties:
 - 1. Test samples of mixes submitted by Contractor.
 - 2. Provide qualified personnel at site. Cooperate with Architect and Contractor in performance of services.
 - 3. Acquaint Architect's personnel with testing procedures and with all special conditions encountered at the site.
 - 4. Perform specified inspections, sampling and testing of products in accordance with specified standards.
 - 5. Ascertain compliance of materials and mixes with requirements of Contract Documents.
 - 6. Promptly notify Architect and Contractor of observed irregularities or non-conformance of Work or products.
 - 7. Perform additional tests and inspections required by Architect.
 - 8. Attend preconstruction meetings and progress meetings as directed by Architect.
 - 9. Submit reports of all tests/inspections specified.
 - 10. Obtain written acknowledgement of each inspection, sampling and test made from subcontractor whose work is being tested.
- C. Limits on Testing/Inspection Agency Authority:
 - 1. Agency may not release, revoke, alter, or enlarge on requirements of Contract Documents.
 - 2. Agency may not approve or accept any portion of the Work.
 - 3. Agency may not assume any duties of Contractor.
 - 4. Agency has no authority to stop the Work.
- D. Contractor Responsibilities:
 - 1. Provide to agency at designated location, adequate samples of materials proposed to be used which require testing, along with proposed mix designs.
 - 2. Cooperate with laboratory personnel, and provide access to the Work and to manufacturers' facilities.
 - a. Monitor or direct superintendent to monitor each inspection, sampling and test.
 - b. Provide laboratory with written acknowledgement of each inspection, sampling or test.
 - c. Within 24 hours notify Architect in writing of reasons for not acknowledging laboratory field procedures.
 - 3. Furnish copies of mill test reports.
 - 4. Furnish verification of compliance with contract requirements for materials and equipment

SECTION 01400

QUALITY REQUIREMENTS

5. Provide incidental labor and facilities:
 - a. To provide access to Work to be tested/inspected.
 - b. To obtain and handle samples at the site or at source of Products to be tested/inspected.
 - c. To facilitate tests/inspections.
 - d. To provide storage and curing of test samples.
6. Notify Architect and laboratory 48 hours prior to expected time for operations requiring testing/inspection services.
7. Employ services of an independent qualified testing laboratory and pay for additional samples, tests, and inspections required by Contractor beyond specified requirements.
8. Arrange with Owner's agency and pay for additional samples, tests, and inspections required by Contractor beyond specified requirements.
9. Correct work which is defective or which fails to conform to the Contract Documents in accordance with the General conditions. Corrective work shall not delay the project schedule or the work of other subcontractors.
10. Re-testing required because of non-conformance to specified requirements shall be performed by the same agency on instructions by Architect. Payment for re testing will be charged to the Contractor by deducting testing charges from the Contract Price.

3.5 MANUFACTURERS' FIELD SERVICES

- A. When specified in individual specification sections, require material or product suppliers or manufacturers to provide qualified staff personnel to observe site conditions, conditions of surfaces and installation, quality of workmanship, start-up of equipment, test, adjust and balance of equipment as applicable, and to initiate instructions when necessary.
- B. Submit qualifications of observer to Architect 30 days in advance of required observations.
 1. Observer subject to approval of Architect.
 2. Observer subject to approval of Owner.
- C. Report observations and site decisions or instructions given to applicators or installers that are supplemental or contrary to manufacturer's written instructions.

3.6 DEFECT ASSESSMENT

- A. Replace Work or portions of the Work not conforming to specified requirements.
- B. If, in the opinion of Architect, it is not practical to remove and replace the Work, Architect will direct an appropriate remedy or adjust payment.

END OF SECTION

SECTION 01425

REFERENCE STANDARDS

PART 1 – GENERAL

1.1 SECTION INCLUDES

- A. Requirements relating to referenced standards.
- B. Reference standards full title and edition date.

1.2 RELATED SECTIONS

- A. Document 00700 - General Conditions: Reference standards.

1.3 QUALITY ASSURANCE

- A. For products or workmanship specified by reference to a document or documents not included in the Project Manual, also referred to as reference standards, comply with requirements of the standard, except when more rigid requirements are specified or are required by applicable codes.
- B. Conform to reference standard of date of issue specified in this section, except where a specific date is established by applicable code.
- C. Obtain copies of standards when required by the Contract Documents.
- D. Maintain copy at project site during submittals, planning, and progress of the specific work, until Substantial Completion.
- E. Should specified reference standards conflict with Contract Documents, request clarification from the Architect before proceeding.
- F. Neither the contractual relationships, duties or responsibilities of the parties in Contract nor those of the Architect shall be altered by the Contract Documents by mention or inference otherwise in any reference document.

PART 2 – CONSTRUCTION INDUSTRY ORGANIZATION DOCUMENTS

2.1 AA – ALUMINUM ASSOCIATION, INC.

- A. AA ADM-1 - Aluminum Design Manual; 2000.
- B. AA DAF-45 - Designation System for Aluminum Finishes; 2003.
- C. AA SAAA-46 - Standards for Anodized Architectural Aluminum; 1978.
- D. AA BDAS-516161 - Behavior and Design of Aluminum Structures; 1992.

2.2 AABC -- ASSOCIATED AIR BALANCE COUNCIL

- A. AABC MN-1 - AABC National Standards for Total System Balance; 2002.

2.3 AAMA -- AMERICAN ARCHITECTURAL MANUFACTURERS ASSOCIATION

- A. AAMA/NWWDA 101/I.S.2 - Voluntary Specifications for Aluminum, Vinyl (PVC) and Wood Windows and Glass Doors; 1997 with revisions contained in "reprinting" of 12/99.
- B. AAMA 303 - Voluntary Specification for Poly (Vinyl Chloride) (PVC) Exterior Profile Extrusions; 2000.
- C. AAMA 501 - Methods of Test for Exterior Walls; 1994.
- D. AAMA 501.1 - Standard Test Method for Exterior Windows, Curtain Walls and Doors for Water Penetration Using Dynamic Pressure; 1994 (part of AAMA 501).
- E. AAMA 501.2 - Field Check of Metal Storefronts, Curtain Walls, and Sloped Glazing Systems for Water Leakage; 1994 (part of AAMA 501).
- F. AAMA 501.3 - Field Check of Water Penetration Through Installed Exterior Windows, Curtain Walls, and Doors by Uniform Air Pressure Difference (part of AAMA 501); 1994.
- G. AAMA 603.8 - Voluntary Performance Requirements and Test Procedures for Pigmented Organic Coatings on Extruded Aluminum; 1998.
- H. AAMA 605.2 - Voluntary Specification for High Performance Organic Coatings on Architectural Aluminum Extrusions and Panels; 1998.
- I. AAMA 606.1 - Voluntary Guide Specifications and Inspection Methods for Integral Color Anodic Finishes for Architectural Aluminum; 1976.

SECTION 01425

REFERENCE STANDARDS

- J. AAMA 607.1 - Voluntary Guide Specification and Inspection Methods for Clear Anodic Finishes For Architectural Aluminum; 1977.
- K. AAMA 608.1 - Voluntary Guide Specification and Inspection Methods for Electrolytically Deposited Color Anodic Finishes for Architectural Aluminum; 1977.
- L. AAMA 609 - Voluntary Guide Specification for Cleaning and Maintenance of Architectural Anodized Aluminum; 2002.
- M. AAMA 610.1 - Voluntary Guide Specification for Cleaning and Maintenance of Painted Aluminum Extrusions and Curtain Wall Panels; 1979.
- N. AAMA 611 - Voluntary Specification for Anodized Architectural Aluminum; 1998.
- O. AAMA 701/702 - Combined Voluntary Specifications for Pile Weatherstrip and Replaceable Fenestration Weatherseals; 2000.
- P. AAMA 800 - Voluntary Specifications and Test Methods for Sealants; 1992, Addendums 1994, 2000.
- Q. AAMA 802.3 - Compound (Part of AAMA 800); 1992.
- R. AAMA 803.3 - Voluntary Specifications and Test Methods for Narrow Joint Seam Sealer (Part of AAMA 800); 1992.
- S. AAMA 804.3 - Sealants: Back Bedding Mastic Type Glazing Tapes (Part of AAMA 800); 1992.
- T. AAMA 806.3 - Tape (Part of AAMA 800); 1992.
- U. AAMA 807.3 - Glazing Tape (Part of AAMA 800); 1992.
- V. AAMA 809.2 - Sealants: Non-Drying Sealant (Part of AAMA 800); 1992.

PART 3 – EXECUTION – NOT USED

END OF SECTION

SECTION 01500

TEMPORARY FACILITIES AND CONTROLS

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Temporary utilities.
- B. Temporary telephone and facsimile service.
- C. Temporary sanitary facilities.
- D. Temporary Controls: Barriers, enclosures, and fencing.
- E. Waste removal facilities and services.
- F. Winter Protection

1.2 RELATED SECTIONS

- A. Section 01510 - Temporary Utilities.
- B. Section 01525 - Field Offices.
- C. Section 01585 - Project Signs.

1.3 TEMPORARY UTILITIES

- A. Refer to Section 01510 – Temporary Utilities for additional information
- B. Provide and pay for all electrical power, lighting, water, heating and cooling, and ventilation required for construction purposes.
- C. Existing facilities may not be used.
- D. New permanent facilities may be used.

1.4 TELEPHONE SERVICE

- A. Provide, maintain, and pay for telephone service to field office at time of project mobilization.
- B. Provide, maintain and pay for facsimile service and a dedicated telephone line to field office at time of project mobilization.

1.5 TEMPORARY SANITARY FACILITIES

- A. Provide and maintain required facilities and enclosures. Provide at time of project mobilization.
- B. Provide and maintain a temporary toilet for all workers on the project, in an enclosed, roofed structure housing adequate plumbing fixtures.
- C. Portable toilets shall be serviced twice weekly, including emptying tanks, recharging with a germicidal and deodorizing solution and scrubbing entire interior with germicidal solution.
- D. As soon as plumbing is installed in building, temporary fixtures may be provided for all workers and portable toilet facilities may be removed from the site.
- E. Use of existing facilities is not permitted.
- F. New permanent facilities may be used during construction operations.
- G. Maintain daily in clean and sanitary condition.
- H. At end of construction, return facilities to same or better condition as originally found.

1.6 TEMPORARY ENVIRONMENTAL CONTROLS

- A. Provide controls over environmental conditions at the construction site and related areas under the Contractor's control.
- B. Equip internal combustion engines on compressors with mufflers to reduce noise to a minimum. Do not operate in enclosed areas without adequate ventilation.
- C. Do not use power actuated tools except where specified in individual specifications
- D. Provide dust control materials to minimize dust from construction operations. Prevent air-borne dust from dispersing into the atmosphere.
- E. Control surface water to prevent damage to the project, the site or adjoining properties. Provide, operate and maintain hydraulic equipment of adequate capacity to control surface water.
- F. Dispose of drainage water in a manner to prevent flooding, erosion, silting, or runoff of silt or sediment or other damage to all portions of the site or to adjoining areas.
- G. Provide rodent control to prevent infestation of construction or storage areas. Employ methods and use materials which will not adversely affect condition at the site or on adjoining properties.

SECTION 01500

TEMPORARY FACILITIES AND CONTROLS

- H. When the use of rodenticides is deemed necessary, submit a copy of proposed program to Architect with a copy to the Owner. Clearly indicate:
 - 1. Areas to be treated.
 - 2. Rodenticides to be used, with copy of manufacturer's current printed instructions.
 - 3. Pollution preventative measures to be employed.
- I. Plan and execute construction and earthwork by methods to control surface drainage from cuts and fills, and from borrow waste disposal areas, to prevent erosion and sedimentation.
- J. Construct fills and waste areas by selective placement to eliminate surface silts or clays which will erode. Periodically inspect earthwork to detect evidence of the start of erosion. Apply corrective measures to control erosion.

1.7 BARRIERS

- A. Provide barriers to prevent unauthorized entry to construction areas, to allow for owner's use of site and to protect existing facilities and adjacent properties from damage from construction operations and demolition.
- B. Provide barricades and covered walkways required by governing authorities for public rights-of-way and for public access to existing building.
- C. Provide protection for plants designated to remain. Replace damaged plants.
- D. Provide temporary barriers 4 foot high around each, or around each group of trees and plants at drip line.
- E. Carefully supervise excavating, grading, and filling and subsequent construction operations, to prevent damage.
- F. Protect non-owned vehicular traffic, stored materials, site, and structures from damage.
- G. Materials may be new or used, suitable for purpose. Materials at Contractor's options, appropriate for purpose. Do not violate code requirements.

1.8 FENCING

- A. Construction: Chain Link Cyclone Fence.
- B. Provide minimum 6 foot high fence around construction site; equip with vehicular and pedestrian gates, with chain link gates and steel posts spaced a 6'-0" on center, maximum. Gates shall be kept locked during all non-working hours. Two sets of keys shall be provided to the Owner.
- C. Contractor shall provide and maintain a temporary construction fence, and where necessary, warning lights in connection therewith in compliance with the requirements of applicable codes and regulations of public agencies having jurisdiction, for the duration of this project.
- D. Maintain and relocate fences and barriers during entire construction period.

1.9 CONSTRUCTION AIDS

- A. Provide and maintain all miscellaneous temporary facilities such as ladders, ramps, scaffolds, hoists, railings, chutes, barricades, enclosures, platforms, walks, etc., as required for the proper execution of the Work.
- B. Materials may be new or used, suitable for purpose. Comply with specified codes and standards.
- C. Consult with Owner's representative, review site conditions and factors which affect construction procedures and construction aids, including adjacent properties and public facilities which may be affected by execution of the work.
- D. Installation:
 - 1. Comply with respective Project Manual Specifications Sections.
 - 2. Relocate construction aids as construction progresses to expedite storage or work requirements and to accommodate legitimate requirements of Owners and other contractors at the site.

SECTION 01500

TEMPORARY FACILITIES AND CONTROLS

1.10 EXTERIOR ENCLOSURES

- A. Provide temporary insulated weather tight closure of exterior openings to accommodate acceptable working conditions and protection for Products, to allow for temporary heating and maintenance of required ambient temperatures identified in individual specification sections, and to prevent entry of unauthorized persons. Provide access doors with self-closing hardware and locks.
- B. All openings under construction or renovation, for which permanent construction will not serve as a security closure, shall be protected by a weatherproof security closure at the end of each working day.
- C. Contractor shall be responsible for inspection and repair, of all security closures, on a daily basis, including non-working days.

1.11 INTERIOR ENCLOSURES

- A. Provide temporary partitions and ceilings as indicated to separate work areas from Owner-occupied areas, to prevent penetration of dust and moisture into Owner-occupied areas, and to prevent damage to existing materials and equipment.
- B. Construction: Framing and reinforced polyethylene sheet materials with closed joints and sealed edges at intersections with existing surfaces:
 - 1. Insulated to R 15.
 - 2. STC rating of 35 in accordance with ASTM E 90.
 - 3. Maximum flame spread rating of 75 in accordance with ASTM E 84.
- C. Paint surfaces exposed to view from Owner-occupied areas.

1.12 WASTE REMOVAL

- A. Provide waste removal facilities and services as required to maintain the site in clean and orderly condition. Do not burn or bury rubbish on project site.
- B. Provide additional collections and disposal of debris whenever regular schedule is inadequate to prevent accumulation.
- C. Provide containers with lids. Remove trash from site periodically.
- D. If materials to be recycled or re-used on the project must be stored on-site, provide suitable non-combustible containers; locate containers holding flammable material outside the structure unless otherwise approved by the authorities having jurisdiction.
- E. Open free-fall chutes are not permitted. Terminate closed chutes into appropriate containers with lids.
- F. Prevent contamination of soil, water or atmosphere by the discharge of noxious substances from construction operations.
- G. Provide equipment and personnel; perform emergency measures to contain all spillages, and to remove contaminated soils or liquids.
- H. Take special measures to prevent harmful substances from entering public waters. Prevent disposal of wastes, effluents, chemicals, or other such substances adjacent to streams, or in sanitary or storm sewer.
- I. Provide systems for control of atmospheric pollutants.
- J. Cleaning
 - 1. Maintain areas under Contractor's control free of waste materials, debris and rubbish.
 - 2. Remove debris and rubbish from closed or remote spaces, prior to closing the space.
 - 3. Control cleaning operations so that dust and other particulates will not adhere to wet or newly-coated surfaces.

SECTION 01500

TEMPORARY FACILITIES AND CONTROLS

1.13 REMOVAL OF UTILITIES, FACILITIES, AND CONTROLS

- A. Remove temporary utilities, equipment, facilities, and materials prior to Substantial Completion.
- B. Remove underground installations to a minimum depth of 2 feet. Grade site as indicated.
- C. Clean and repair damage caused by installation or use of temporary work.
- D. Restore existing facilities used during construction to original condition.
- E. Restore new permanent facilities used during construction to specified condition.
- F. Grade site areas affected by temporary installations to indicated elevations and slopes, and clean the area.
- G. Completely remove fences and barriers, including foundations when construction has progressed to the point that they are no longer needed, and when approved by the Architect.

1.14 WINTER PROTECTION AND WORK

- A. Contractor is to provide and pay for all materials, equipment, labor, utilities, transportation, etc. required to completely enclose and "winter protect" all of the buildings and excavations during construction. The schedule dictates that complete enclosure will be required to complete the project on time. No extensions of time or additional fees will be approved for any delays due to weather or site conditions.
- B. The site and access routes are to be maintained as required to facilitate the winter protection and work.

PART 2 – PRODUCTS – NOT USED

PART 3 – EXECUTION – NOT USED

END OF SECTION

SECTION 01510

TEMPORARY UTILITIES

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Temporary Utilities: Electricity, lighting, heat, ventilation, and water.

1.2 RELATED SECTIONS

- A. Section 01500 - Temporary Facilities and Controls: Telephone service for administrative purposes.

1.3 TEMPORARY ELECTRICITY

- A. Cost: By Contractor.
- B. Provide power service required from utility source.
- C. Power Service Characteristics: 120/240 volt, 15 ampere, three phase, four wire, complete with circuit breakers, disconnect switches and other devices required.
- D. Provide power outlets for construction operations, with branch wiring and distribution boxes located at each floor. Provide flexible power cords as required, 50 ft. maximum.
- E. Provide main service disconnect and over-current protection at convenient location and meter.
- F. Permanent convenience receptacles may be utilized during construction.
- G. Provide adequate distribution equipment, wiring, and outlets to provide single phase branch circuits for power and lighting.
 - 1. Provide 20 ampere duplex outlets, single phase circuits for power tools for every 75 feet of active work area.
 - 2. Provide 20 ampere, single phase branch circuits for lighting.
- H. All temporary equipment and wiring for power and lighting shall be in accordance with the applicable provisions of the governing codes. Maintain in a safe manner and utilize so as not to constitute a hazard to persons or property.
- I. All extension cords shall be furnished by the Contractor. Any subcontractor requiring special electrical power shall arrange for the installation and costs thereof with contractor.

1.4 TEMPORARY LIGHTING FOR CONSTRUCTION PURPOSES

- A. Provide and maintain incandescent lighting for construction operations to achieve a minimum lighting level of 2 watt/sq ft.
- B. Provide and maintain 1 watt/sq ft lighting to exterior staging and storage areas after dark for security purposes.
- C. Provide and maintain 0.25 watt/sq ft H.I.D. lighting to interior work areas after dark for security purposes.
- D. Provide branch wiring from power source to distribution boxes with lighting conductors, pigtails, and lamps as required.
- E. Maintain lighting and provide routine repairs. Equip all lamps with guards.
- F. Permanent building lighting may be utilized during construction.

1.5 TEMPORARY HEATING

- A. Cost of Energy: By Contractor.
- B. Provide heating devices and heat as needed to maintain specified conditions for construction operations.
 - 1. Temporary heating shall be smokeless portable space heaters of type approved by UL, Factory Mutual, the Fire Marshal or other governing authorities.
- C. Maintain minimum ambient temperature of 45 degrees F at surfaces where construction is in progress, unless indicated otherwise in specifications.
- D. Existing facilities shall not be used.

SECTION 01510

TEMPORARY UTILITIES

1.6 TEMPORARY COOLING

- A. Cost of Energy: By Contractor.
- B. Provide cooling devices and cooling as needed to maintain specified conditions for construction operations.
- C. Maintain maximum ambient temperature of 85 degrees F at surfaces where construction is in progress, unless indicated otherwise in specifications.
- D. Existing facilities shall not be used.
- E. Prior to operation of permanent equipment for temporary cooling purposes, verify that installation is approved for operation, equipment is lubricated and filters are in place. Provide and pay for operation, maintenance, and regular replacement of filters and worn or consumed parts.

1.7 TEMPORARY VENTILATION

- A. Existing ventilation equipment may not be used.

1.8 TEMPORARY WATER SERVICE

- A. Cost of Water Used: By Contractor.
- B. Provide and maintain suitable quality water service for construction operations at time of project mobilization.
- C. Connect to existing water source.
 1. Exercise measures to conserve water.
 2. Provide separate metering and reimburse Owner for cost of water used.
- D. Extend branch piping with outlets located so water is available by hoses with threaded connections. Provide temporary pipe insulation to prevent freezing.
- E. If required, provide a house pump complete with necessary operating controls, starters and switches, to supply adequate capacity with minimum 20 lb. pressure at each outlet.
 1. Do not use pumps specified for permanent installation.

1.9 PERMANENT SYSTEM USED AS TEMPORARY FACILITIES

- A. When any portions of the Permanent Systems are in operating condition, that part of the system may be used as a temporary facility, provided that the Contractor:
 1. Obtains the Architect's written approval.
 2. Assumes full responsibility for the system used.
 3. Pays all costs for operation, maintenance, cleaning, and restoration of the system.
 4. Operates the system under the supervision of the subcontractors' responsible for the systems installation and ultimate performance.
 5. Operates the Air Circulating System without refrigeration or chilling and:
 - a. Provides temporary approved filters within the fan enclosure to adequately filter air being distributed through the ductwork to the supply outlets.
 - b. Places disposable filters in front of the exhaust registers to keep construction dirt out of exhaust ductwork.
 - c. Clean all ductwork upon completion of temporary use.
 6. Pay all costs for fuel and energy consumed. Upon receipt of the Certificate of Substantial Completion arrange with utility companies to make a final reading of meters. Submit a copy of meter readings to Owner.

PART 2 – PRODUCTS – NOT USED

PART 3 – EXECUTION – NOT USED

END OF SECTION

SECTION 01525

FIELD OFFICES

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Field Offices
- B. Maintenance and removal.

1.2 RELATED SECTIONS

- A. Section 01100 - Summary: Use of premises and responsibility for providing field offices.
- B. Section 01500 - Temporary Facilities and Controls: Temporary sanitary facilities, temporary telephone service, and temporary facsimile service.

1.3 USE OF EXISTING FACILITIES

- A. Existing facilities shall not be used for field offices.

1.4 USE OF PERMANENT FACILITIES

- A. When permanent facilities are enclosed with operable utilities, relocate offices into building, with written agreement of Owner, and remove temporary buildings.

PART 2 – PRODUCTS

2.1 MATERIALS, EQUIPMENT, FURNISHINGS

- A. Materials, Equipment, Furnishings: Serviceable, new or used, adequate for required purpose.
- B. Provide, maintain, field office; provide specified services, furnishings and equipment to:
 - 1. Architect.
 - 2. General Contractor
 - 3. Allocate three reserved parking spaces, convenient to offices, for use of Architect and Owner's representative.
 - 4. Allow for conference room with a table and chairs for a minimum of 25 people.

2.2 CONSTRUCTION

- A. Portable or mobile buildings, or buildings constructed with floors raised above ground, securely fixed to foundations, with steps and landings at entrance doors. Do not use field offices for living quarters.
- B. Construction: Structurally sound, secure, weather tight enclosures for office. Maintain during progress of Work; remove when no longer needed or when directed by Architect/Engineer.
- C. Temperature Transmission Resistance of Floors, Walls, and Ceilings: Compatible with occupancy requirements.
- D. Exterior Materials: Weather resistant, finished in one color.
- E. Interior Materials in Offices: Sheet type materials for walls and ceilings, prefinished or painted; resilient floors and bases.
- F. Lighting for Offices: 50 fc at desk top height, exterior lighting at entrance doors.
- G. Fire Extinguishers: One standard dry chemical (ABC) type for each office.

2.3 ENVIRONMENTAL CONTROL

- A. Heating, Cooling, and Ventilating: Automatic equipment to maintain 68 degrees F heating and 76 degrees F cooling.

2.4 REQUIREMENTS OF REGULATORY AGENCIES

- A. Comply with Federal and State Regulations.
- B. Obtain and pay for permits required by governing authorities only on Owner's prior written authorization.

SECTION 01525

FIELD OFFICES

PART 3 – EXECUTION

3.1 PREPARATION

- A. Fill and grade sites for temporary structures to provide drainage away from buildings.

3.2 INSTALLATION

- A. Install office spaces ready for occupancy 15 days after date fixed in Notice to Proceed.
- B. Orientation of office will provide view of the project through the office window.
- C. Mount thermometer at convenient location but not in direct sunlight.
- D. Mount fire extinguisher in prominent locations with clear access to use.

3.3 MAINTENANCE AND CLEANING

- A. Weekly janitorial services for offices; periodic cleaning and maintenance for offices.
- B. Maintain approach walks free of mud, water, and snow.

3.4 REMOVAL

- A. At completion of Work remove buildings, foundations, utility services, and debris. Restore areas.

END OF SECTION

SECTION 01550

VEHICULAR ACCESS AND PARKING

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Temporary Construction: Contractor's option.
- B. Materials for Permanent Construction: As specified in product specification sections, including earthwork, paving base, and topping.

1.2 SIGNS, SIGNALS, AND DEVICES

- A. Post Mounted and Wall Mounted Traffic Control and Informational Signs: Specified in Section 01585
- B. Automatic Traffic Control Signals: As approved by local jurisdictions.
- C. Traffic Cones and Drums, Flares and Lights: As approved by local jurisdictions.
- D. Flag Person Equipment: As required by local jurisdictions.

PART 2 – PRODUCTS

2.1 MATERIALS

- A. Temporary Construction: Contractor's option.
- B. Materials for Permanent Construction: As specified in product specification sections, including earthwork, paving base, and topping.

2.2 SIGNS, SIGNALS, AND DEVICES

- A. Post Mounted and Wall Mounted Traffic Control and Informational Signs: Specified in Section 01585
- B. Automatic Traffic Control Signals: As approved by local jurisdictions.
- C. Traffic Cones and Drums, Flares and Lights: As approved by local jurisdictions.
- D. Flag Person Equipment: As required by local jurisdictions.

PART 3 – EXECUTION

3.1 PREPARATION

- A. Clear areas, provide surface and storm drainage of road, parking, area premises, and adjacent areas.

3.2 ACCESS ROADS

- A. Use of existing on-site streets and driveways for construction traffic is not permitted.
- B. Tracked vehicles not allowed on paved areas.
- C. Construct new temporary all-weather access roads from public thoroughfares to serve construction area, of a width and load bearing capacity to provide unimpeded traffic for construction purposes.
- D. Construct temporary bridges and culverts to span low areas and allow unimpeded drainage.
- E. Extend and relocate as Work progress requires, provide detours as necessary for unimpeded traffic flow.
- F. Location as indicated.
- G. Provide unimpeded access for emergency vehicles. Maintain 20 foot width driveways with turning space between and around combustible materials.
- H. Provide and maintain access to fire hydrants free of obstructions.
- I. The Contractor shall obtain and pay for permits and inspections made necessary by the use of public streets, sidewalks, curbs and paving, post guarantees and bonds that may be required in connection therewith, and repair and make good any damages thereto acceptable to the authorities having jurisdiction.

SECTION 01550

VEHICULAR ACCESS AND PARKING

3.3 PARKING

- A. Use of existing parking facilities by construction personnel is not permitted.
- B. Use of new parking facilities by construction personnel is not permitted.
- C. Do not allow heavy vehicles or construction equipment in parking areas.
- D. Arrange for temporary parking areas to accommodate use of construction personnel.
- E. When site space is not adequate, provide additional off-site parking.
- F. Locate as indicated.

3.4 NEW PERMANENT PAVEMENTS

- A. Prior to Substantial Completion the base for permanent roads and parking areas may be used for construction traffic.
 - 1. Review conditions of base and substrate materials with Architect prior to placing top course materials. Provide for proof rolling where determined necessary by the Architect.
 - 2. Damage caused to the base materials or substrate by construction traffic will be repaired to meet the design standards at no additional cost to the Owner.
- B. Avoid traffic loading beyond paving design capacity. Tracked vehicles not allowed.

3.5 CONSTRUCTION PARKING CONTROL

- A. Control vehicular parking to prevent interference with public traffic and parking, access by emergency vehicles, and Owner's operations.
- B. Monitor parking of construction personnel's vehicles in existing facilities. Maintain vehicular access to and through parking areas.
- C. Prevent parking on or adjacent to access roads or in non-designated areas.

3.6 FLAG PERSONS

- A. Provide trained and equipped flag persons to regulate traffic when construction operations or traffic encroach on public traffic lanes.

3.7 FLARES AND LIGHTS

- A. Use flares and lights during hours of low visibility to delineate traffic lanes and to guide traffic.

3.8 HAUL ROUTES

- A. Consult with authority having jurisdiction, establish public thoroughfares to be used for haul routes and site access.
- B. Confine construction traffic to designated haul routes.
- C. Provide traffic control at critical areas of haul routes to regulate traffic, to minimize interference with public traffic.

3.9 TRAFFIC SIGNS AND SIGNALS

- A. At approaches to site and on site, install at crossroads, detours, parking areas, and elsewhere as needed to direct construction and affected public traffic.
- B. Install and operate automatic traffic control signals to direct and maintain orderly flow of traffic in areas under Contractor's control, and areas affected by Contractor's operations.
- C. Relocate as Work progresses, to maintain effective traffic control.

3.10 MAINTENANCE

- A. Maintain traffic and parking areas in a sound condition free of excavated material, construction equipment, Products, mud, snow, and ice.
- B. Maintain existing paved areas used for construction; promptly repair breaks, potholes, low areas, standing water, and other deficiencies, to maintain paving and drainage in original, or specified, condition.

SECTION 01550

VEHICULAR ACCESS AND PARKING

3.11 REMOVAL, REPAIR

- A. Remove temporary roads before Substantial Completion.
- B. Remove underground work and compacted materials to a depth of 2 feet; fill and grade site as specified.
- C. Repair existing facilities damaged by use, to original condition.
- D. Remove equipment and devices when no longer required.
- E. Repair damage caused by installation.
- F. Remove post settings to a depth of 2 feet.

3.12 MUD FROM SITE VEHICLES

- A. Provide means of removing mud from vehicle wheels before entering streets.

END OF SECTION

SECTION 01585

PROJECT SIGNS

PART 1 – GENERAL

1.1 SECTION INCLUDES

- A. Project identification sign.
- B. Project informational signs.

1.2 RELATED SECTIONS

- A. Section 01100 - Summary: Responsibility to provide signs.
- B. Section 01550 - Vehicular Access and Parking: Parking and Traffic Control Signs.

1.3 QUALITY ASSURANCE

- A. Design sign and structure to withstand 90 miles/hr wind velocity.
- B. Sign Size: Per Drawings.
- C. Material Standards: those specified in respective specification sections for products used.
- D. Sign Maker: Experienced as a professional sign painter for minimum three years.
- E. Finishes, Painting: Adequate to withstand weathering, fading, and chipping for duration of construction.

1.4 SUBMITTALS

- A. See Section 01300 - Administrative Requirements for submittal procedures.
- B. Shop Drawing: Show content, layout, lettering, color, foundation, structure, sizes and grades of members.

PART 2 – PRODUCTS

2.1 SIGN MATERIALS

- A. Structure and Framing: New or used wood but must be sound and structurally adequate.
- B. Preservative Treatment: For wood supports in contact with ground, as required to prevent deterioration during specified period of use.
- C. Grade: As required to meet structural requirements and suitable for specified finish.
- D. Sign Surfaces: Exterior grade plywood, ADA, with medium density overlay, minimum 3/4" thick.
- E. Rough Hardware: Galvanized, aluminum or brass.
- F. Paint and Primers: A nationally recognized manufacturer, special sign paint, one coat of primer, minimum one coat of exterior enamel.
- G. Lettering: Pre-cut vinyl self adhesive products, colors as selected by architect.

2.2 PROJECT IDENTIFICATION SIGN

- A. One painted sign of construction, design, content and location as shown on Drawings.
- B. Content:
 - 1. Project number, title, logo and name of Owner.
 - 2. Names and titles of authorities.
 - 3. Names and titles of TRIA Architecture and consultants.
 - 4. Building rendering.
 - 5. Name of general contractor.
- C. Refer to drawings for additional information to be included on the sign.
- D. Graphic design, colors, style of lettering, etc. as designated by Tria Architecture.

2.3 PROJECT INFORMATIONAL SIGNS

- A. Painted informational signs of same colors and lettering as Project Identification sign, or standard products; size lettering to provide legibility at 100 foot distance.
- B. Provide at each field office and storage shed.
- C. Directional signs to direct traffic into and within site. Relocate as Work progress requires.
- D. Provide municipal traffic agency directional traffic signs to and within site.

SECTION 01585

PROJECT SIGNS

PART 3 – EXECUTION

3.1 INSTALLATION

- A. Install project identification sign within 30 days after date fixed by Notice to Proceed.
- B. Erect at designated location.
- C. Erect supports and framing on secure foundation, rigidly braced and framed to resist wind loadings.
- D. Brace Framing: Drive stakes to loading requirements to secure setting minimum depth: 12 inches. Secure framing members to stakes, cut tops of stakes to even line, flush with framing members.
- E. Frame members, secure to supports: to Code requirements and applicable trade standards. Space members to widths of surfacing material, maximum 24 inches on center.
- F. Install sign surface plumb and level, with butt joints. Anchor securely.
- G. Paint exposed surfaces of sign, supports and framing except creosoted posts.

3.2 MAINTENANCE

- A. Maintain signs and supports clean, repair deterioration and damage.

3.3 REMOVAL

- A. Remove signs, framing, supports and foundations at completion of Project, when approved by Architect, and restore the area.

END OF SECTION

SECTION 01600

PRODUCT REQUIREMENTS

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. General product requirements.
- B. Transportation, handling, storage and protection.
- C. Product option requirements.
- D. Substitution limitations and procedures.
- E. Procedures for Owner-supplied products.
- F. Spare parts and maintenance materials.

1.2 RELATED SECTIONS

- A. Document 00100 - Instructions to Bidders: Product options and substitution procedures prior to bid date.
- B. Section 01400 - Quality Requirements: Product quality monitoring.

1.3 REFERENCES

- A. NFPA 70 - National Electrical Code; National Fire Protection Association; 2002.

1.4 SUBMITTALS

- A. Proposed Products List: Submit list of major products proposed for use, with name of manufacturer, trade name, and model number of each product; submit 3 copies to Architect.
 - 1. Submit within 20 days after date of Letter of Intent.
 - 2. For products specified only by reference standards, list applicable reference standards.
- B. Product Data Submittals: Submit manufacturer's standard published data. Mark each copy to identify applicable products, models, options, and other data. Supplement manufacturers' standard data to provide information specific to this Project.
- C. Shop Drawing Submittals: Prepared specifically for this Project.
- D. Sample Submittals: Illustrate functional and aesthetic characteristics of the product, with integral parts and attachment devices. Coordinate sample submittals for interfacing work.
 - 1. For selection from standard finishes, submit samples of the full range of the manufacturer's standard colors, textures, and patterns.
- E. Indicate utility and electrical characteristics, utility connection requirements, and location of utility outlets for service for functional equipment and appliances.
- F. Provide name and address of similar projects on which product was used and date of installation.
- G. Provide detailed description and drawings illustrating construction methods.
- H. Provide itemized comparison and accurate cost data of proposed substitution in comparison with product or method specified.
- I. Provide data relating to changes in contracts, coordination issues, and construction schedules.
- J. Manufacturer's Instructions: When Contract Documents specify that installation shall comply with manufacturer's printed instructions, obtain and distribute copies of such instructions to all parties involved in the installation, including three copies to the Architect.

PART 2 – PRODUCTS

2.1 NEW PRODUCTS

- A. Provide new products unless specifically required or permitted by the Contract Documents.
- B. Motors: Refer to Section 15065, NEMA MG 1 Type. Specific motor type is specified in individual specification sections.
- C. Materials and Equipment Incorporated Into The Work
 - 1. NO MATERIAL OR PRODUCT SHALL BE DELIVERED TO, PROVIDED FOR OR INSTALLED ON PROJECT WHICH CONTAINS ANY ASBESTOS OR ASBESTOS-CONTAINING MATERIAL.
 - 2. Conform to project specifications and standards.
 - 3. Comply with size, make, type and quality specified.

SECTION 01600

PRODUCT REQUIREMENTS

4. Manufactured and fabricated products:
 - a. Design, fabricate and assemble in accord with best engineering and shop practices.
 - b. Manufacture like parts of duplicate units to standard sizes and gages, to be interchangeable.
 - c. Two or more items of the same kind shall be identical from the same manufacturer.
 - d. All parts of systems shall be from the same manufacturer to the greatest extent practicable.
 - e. Adhere to equipment capacities, sizes and dimensions shown or specified unless variations are specifically approved by Change Order.

2.2 PRODUCT OPTIONS

- A. Base all bids on providing all products exactly as specified.
- B. Products Specified by Reference Standards or by Description Only: Use any product meeting those standards or description.
- C. Products Specified by Naming One or More Manufacturers: Use a product of one of the manufacturers named and meeting specifications, no options or substitutions allowed.
- D. Products Specified by Naming One or More Manufacturers with a Provision for Substitutions: Submit a request for substitution for any manufacturer not named.

2.3 SPARE PARTS AND MAINTENANCE PRODUCTS

- A. Provide spare parts, maintenance, and extra products of types and in quantities specified in individual specification sections.
- B. Deliver to Project site; obtain receipt prior to final payment.

PART 3 – EXECUTION

3.1 SUBSTITUTION PROCEDURES

- A. Instructions to Bidders specify time restrictions for submitting requests for substitutions during the bidding period. Comply with requirements specified in this section.
- B. Architect will consider requests for substitutions only within 20 days after date of Letter of Intent.
- C. Substitutions may be considered at a later date only when a product becomes unavailable through no fault of the Contractor.
- D. Document each request with complete data substantiating compliance of proposed substitution with Contract Documents.
- E. For products specified only by reference or performance standards, select any product which meets or exceeds standards, by any manufacturers, subject to the Architect's approval.
- F. For products specified by naming several products or manufacturers, select any product and manufacturer named which conforms to the intent of the documents.
- G. Substitutions, Bidder/Contractor Options
 1. Prior to Bid Opening: The Architect will consider written requests to amend the bidding documents to add products not specified provided such requests are received at least 10 calendar days prior to bid opening date. Requests received after that time will not be considered. When a request is approved, the Architect will issue an appropriate addendum not less than three calendar days prior to the bid opening.
 2. With Bid: A bidder may propose substitutions with his bid by completing the Substitution Sheet with the Bid Form, subject to the provisions stated thereon. Architect will review Substitution Sheet of low bidder and recommend approval or rejection by Owner prior to award of Contract.
 3. After Award of Contract: No substitutions will be considered after Notice of Award except under one or more of the following conditions:
 - a. Substitutions required for compliance with final interpretations of code requirements or insurance regulations.
 - b. Unavailability of specified products, through no fault of Contractor or subcontractor.

SECTION 01600

PRODUCT REQUIREMENTS

- c. Subsequent information discloses inability of all specified products to perform properly or to fit in designated space.
 - d. Manufacturer/fabricator refusal to certify or guarantee performance of specified product as specified.
 - e. When a substitution would be substantially beneficial to the Owner.
- H. A request for substitution constitutes a representation that the submitter:
- 1. Has investigated proposed product and determined that it meets or exceeds the quality level of the specified product.
 - 2. Will provide the same warranty for the substitution as for the specified product.
 - 3. Will coordinate installation and make changes to other Work which may be required for the Work to be complete with no additional cost to Owner.
 - 4. Waives claims for additional costs or time extension which may subsequently become apparent.
 - 5. Will reimburse Owner and Architect for review or redesign services associated with re-approval by authorities.
- I. Substitutions will not be considered when they are indicated or implied on shop drawing or product data submittals, without separate written request, or when acceptance will require revision to the Contract Documents.
- J. Substitution Submittal Procedure:
- 1. Submit three copies of request for substitution for consideration. Limit each request to one proposed substitution.
 - 2. Submit shop drawings, product data, and certified test results attesting to the proposed product equivalence. Burden of proof is on proposer.
 - 3. The Architect will notify Contractor in writing of decision to accept or reject request.
 - 4. Complete data substantiating compliance of proposed substitution with Contract Documents.
 - 5. For products:
 - a. Product identification, including manufacturer's name and address.
 - b. Manufacturer's literature:
 - 1) Product description.
 - 2) Performance and test data.
 - 3) Reference standards.
 - c. Samples.
 - d. Name and address of similar projects on which product was used and date of installation.
 - 6. For construction methods:
 - a. Detailed description of proposed method.
 - b. Drawings illustrating methods.
 - 7. Itemized comparison of proposed substitutions with product or method specified.
 - 8. Data relating to changes in construction schedules.
 - 9. Identify:
 - a. Other contract affected.
 - b. Changes or coordination required.
 - 10. Accurate cost data on proposed substitution in comparison with product or method specified.
- K. Provide cost data that is complete and includes all related costs under Bidder/Contractor contract, but excludes:
- 1. Costs under separate contracts.
 - 2. Architect's redesign.
 - 3. Administrative costs of Architect.

3.2 OWNER-SUPPLIED PRODUCTS

- A. See Section 01100 - Summary for identification of Owner-supplied products.
- B. Owner's Responsibilities:
 - 1. Arrange for and deliver Owner reviewed shop drawings, product data, and samples, to Contractor.
 - 2. Arrange and pay for product delivery to site.
 - 3. On delivery, inspect products jointly with Contractor.

SECTION 01600

PRODUCT REQUIREMENTS

4. Submit claims for transportation damage and replace damaged, defective, or deficient items.
5. Arrange for manufacturer's warranties, inspections, and service.
- C. Contractor's Responsibilities:
 1. Review Owner reviewed shop drawings, product data, and samples.
 2. Receive and unload products at site; inspect for completeness or damage jointly with Owner.
 3. Handle, store, install and finish products.
 4. Repair or replace items damaged after receipt.

3.3 TRANSPORTATION AND HANDLING

- A. Coordinate schedule of product delivery to designated prepared areas in order to minimize site storage time and potential damage to stored materials.
- B. Transport and handle products in accordance with manufacturer's instructions.
- C. Transport materials in covered trucks to prevent contamination of product and littering of surrounding areas.
- D. Arrange for transportation and deliveries of materials and equipment in accordance with approved current construction schedules and in ample time to facilitate inspection prior to installation.
- E. Coordinate deliveries to avoid conflict with work and condition at site.
- F. Deliver products in undamaged condition in original containers or packaging, with identifying labels intact and legible. Clearly mark partial deliveries of component parts of assemblies or equipment to permit easy identification of parts and to facilitate assembly.
- G. Lift packages, equipment, or components only at designated lift points.
- H. Promptly inspect shipments to ensure that products comply with requirements, quantities are correct, and products are undamaged.
- I. Provide equipment and personnel, including those furnished by Owner, to handle products by methods to prevent soiling, disfigurement, or damage.
- J. Arrange for the return of packing materials, such as wood pallets, where economically feasible.

3.4 STORAGE AND PROTECTION

- A. Designate receiving/storage areas for incoming products so that they are delivered according to installation schedule and placed convenient to work area in order to minimize waste due to excessive materials handling and misapplication.
- B. Store and protect products in accordance with manufacturer's instructions.
- C. Store with seals and labels intact and legible.
- D. Store sensitive products in weather tight, climate controlled, enclosures in an environment favorable to product. Materials may be new or used at Contractor's option, but shall be non-staining, non-hazardous, and of sufficient strength and durability for proposed use.
- E. Submittals
 1. Request for allocation of storage space.
 2. List of materials and equipment to be stored.
 3. Proposed location for storage.
 4. Special storage requirements.
 5. Schedule of anticipated storage dates.
- F. For exterior storage of fabricated products, place on sloped supports above ground.
- G. Provide bonded off-site storage and protection when site does not permit on-site storage or protection. Off-site storage will be permitted only on Owner's prior written authorization in accordance with General Conditions.
- H. Cover products subject to deterioration with impervious sheet covering. Provide ventilation to prevent condensation and degradation of products.
- I. Store loose granular materials on solid flat surfaces in a well-drained area. Prevent mixing with foreign matter.
- J. Prevent contact with material that may cause corrosion, discoloration, or staining.
- K. Provide equipment and personnel to store products by methods to prevent soiling, disfigurement, or damage.
- L. Arrange storage of products to permit access for inspection. Periodically inspect to verify products are undamaged and are maintained in acceptable condition.

SECTION 01600

PRODUCT REQUIREMENTS

- M. Locate storage areas where authorized by Architect, Contractor will resolve conflicts in storage requirements of all subcontractors. Do not inhibit use of:
 - 1. Fire exits.
 - 2. Fire lanes.
 - 3. Parking.
 - 4. Work of other contractors.
 - 5. Owner.
- N. Provide separate storage for combustible and non-combustible products. Store combustible materials in accordance with Fire Protection Agency's regulations.
- O. Remove all temporary storage, contents and utilities at completion of construction activities or when requested by the Architect.

END OF SECTION

SECTION 01700

EXECUTION REQUIREMENTS

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Examination, preparation, and general installation procedures.
- B. Pre-installation meetings.
- C. Cutting and patching.
- D. Surveying for laying out the work.
- E. Cleaning and protection.
- F. Starting of systems and equipment.
- G. Demonstration and instruction of Owner personnel.
- H. Closeout procedures, except payment procedures.

1.2 RELATED SECTIONS

- A. Section 01300 - Administrative Requirements: Submittals procedures.
- B. Section 01400 - Quality Requirements: Testing and inspection procedures.
- C. Section 01500 - Temporary Facilities and Controls: Temporary exterior enclosures.
- D. Section 01780 - Closeout Submittals: Project record documents, operation and maintenance data, warranties and bonds.
- E. Section 07840 - Firestopping.
- F. Section 15990 – Mechanical Systems Commissioning

1.3 SUBMITTALS

- A. See Section 01300 - Administrative Requirements, for submittal procedures.
- B. Survey work: Submit name, address, and telephone number of Surveyor before starting survey work.
 - 1. On request, submit documentation verifying accuracy of survey work.
 - 2. Submit a copy of site drawing signed by the Land Surveyor, that the elevations and locations of the work are in conformance with Contract Documents. Include the following data:
 - 3. Architect may at any time require written verifications of grades, lines and levels by a licensed surveyor as work progresses.
 - 4. All areas found to be non-conforming to the Contract Documents shall be corrected by the responsible Contractor.
 - 5. Submit surveys and survey logs for the project record.
- C. Cutting and Patching: Submit written request in advance of cutting or alteration which affects:
 - 1. Structural integrity of any element of Project.
 - 2. Integrity of weather exposed or moisture resistant element.
 - 3. Efficiency, maintenance, or safety of any operational element.
 - 4. Visual qualities of sight exposed elements.
 - 5. Work of Owner or separate Contractor.
 - 6. Include in request:
 - a. Identification of Project.
 - b. Location and description of affected work.
 - c. Necessity for cutting or alteration.
 - d. Contractor and crafts to execute the work.
 - e. Description of proposed work and products to be used.
 - f. Extent of refinishing.
 - g. Alternatives to cutting and patching.
 - h. Effect on work of Owner or separate Contractor.
 - i. Written permission of affected separate Contractor.
 - j. Date and time work will be executed.
- D. Designation of party responsible for cost of cutting and patching.
- E. When conditions of work, or schedule, indicate change of materials or methods, submit recommendation to Architect, including:
 - 1. Condition indicating change.

SECTION 01700

EXECUTION REQUIREMENTS

2. Recommendation for alternative materials or methods.
3. Submittals specified for substitutions.
- F. Submit written notice to Architect, designating time work will be uncovered, to provide for observation.
- G. Payment for Costs:
 1. Costs caused by ill-timed or defective work, or work not conforming to Contract Documents, including costs for additional services of Architect - party responsible for ill timed, rejected or non-conforming work.
 2. Work done by change order, other than defective or non-conforming work - Owner.

1.4 GRADES, LINES AND LEVELS

- A. Contractor lay out all of the work under this contract.
 1. Establish all working lines, levels, elevations and measurements.
- B. Owner will furnish:
 1. A certified topographic survey of existing site, giving all grades and lines of streets, alleys, pavements and adjoining property, rights-of-way, encroachments, boundaries and contours of building site.
 2. Locations, dimensions and data pertaining to existing:
 - a. Buildings.
 - b. Underground obstructions.
 - c. Trees and landscaping.
 - d. Other improvements.
 3. Information as to available service and utility lines, both public and private.
- C. Location of survey's baseline control points.
 1. Benchmark and temporary benchmark location and elevation of each.
- D. Quality Assurance
 1. All layout work which establishes site layout dimensions or elevations or exterior building dimensions, angles or grade floor elevations shall be done by a qualified engineer or surveyor.
 2. Qualifications of Contractor's Engineer/Surveyor:
 - a. Experienced in layout work of similar complexity.
 - b. Licensed by State of Illinois.
- E. Submittals. Architect may at any time require written verification of grades, lines and levels by a licensed surveyor as work progresses.
- F. Laying Out The Work
 1. Prior to the beginning of the actual work, perform the following:
 - a. Each subcontractor shall lay out their portion of the work.
 - b. Establish all required bench marks and reference lines.
 - c. Verify all building dimensions.
 - d. Verify conformance of all actual general dimensions with those indicated on the Architect's plan.
 - e. Notify the Architect immediately if any conflict whatsoever exists.
- G. Survey Upon Completion
 1. Upon completion, Owner may provide a survey performed by a licensed surveyor indicating the location of the Work of this Contract and including the following data:
 - a. Building location and dimensions of all walls.
 - b. Elevations of finished floor at all exterior exits.
 - c. Spot elevations, storm, sanitary and watermain manholes, and all invert elevations.
 - d. Spot elevations of corners of all new pavement and on a 50' grid within paved areas.
 2. All areas found to be non-conforming to the Contract Documents shall be corrected by the responsible Contractor.

SECTION 01700

EXECUTION REQUIREMENTS

1.5 QUALIFICATIONS

- A. For survey work, employ a land surveyor registered in the State in which the Project is located and acceptable to Architect. Submit evidence of Surveyor's Errors and Omissions insurance coverage in the form of an Insurance Certificate.
- B. For field engineering, employ a professional engineer of the discipline required for specific service on Project, licensed in the State in which the Project is located.

1.6 PROJECT CONDITIONS

- A. Grade site to drain. Maintain excavations free of water. Provide, operate, and maintain pumping equipment.
- B. Protect site from puddling or running water. Provide water barriers as required to protect site from soil erosion.
- C. Ventilate enclosed areas to assist cure of materials, to dissipate humidity, and to prevent accumulation of dust, fumes, vapors, or gases.
- D. Dust Control: Execute work by methods to minimize raising dust from construction operations. Provide positive means to prevent air-borne dust from dispersing into atmosphere.
- E. Erosion and Sediment Control: Plan and execute work by methods to control surface drainage from cuts and fills, from borrow and waste disposal areas. Prevent erosion and sedimentation.
 - 1. Minimize amount of bare soil exposed at one time.
 - 2. Provide temporary measures such as berms, dikes, and drains, to prevent water flow.
 - 3. Construct fill and waste areas by selective placement to avoid erosive surface silts or clays.
 - 4. Periodically inspect earthwork to detect evidence of erosion and sedimentation; promptly apply corrective measures.
- F. Noise Control: Provide methods, means, and facilities to minimize noise produced by construction operations.
- G. Pest Control: Provide methods, means, and facilities to prevent pests and insects from damaging the work.
- H. Rodent Control: Provide methods, means, and facilities to prevent rodents from accessing or invading premises.
- I. Pollution Control: Provide methods, means, and facilities to prevent contamination of soil, water, and atmosphere from discharge of noxious, toxic substances, and pollutants produced by construction operations.

1.7 COORDINATION

- A. Coordinate scheduling, submittals, and work of the various sections of the Project Manual to ensure efficient and orderly sequence of installation of interdependent construction elements, with provisions for accommodating items installed later.
- B. Notify affected utility companies and comply with their requirements.
- C. Verify that utility requirements and characteristics of new operating equipment are compatible with building utilities. Coordinate work of various sections having interdependent responsibilities for installing, connecting to, and placing in service, such equipment.
- D. Coordinate space requirements, supports, and installation of mechanical and electrical work which are indicated diagrammatically on Drawings. Follow routing shown for pipes, ducts, and conduit, as closely as practicable; place runs parallel with lines of building. Utilize spaces efficiently to maximize accessibility for other installations, for maintenance, and for repairs.
- E. In finished areas except as otherwise indicated, conceal pipes, ducts, and wiring within the construction. Coordinate locations of fixtures and outlets with finish elements.
- F. Coordinate completion and clean-up of work of separate sections.
- G. After Owner occupancy of premises, coordinate access to site for correction of defective work and work not in accordance with Contract Documents, to minimize disruption of Owner's activities.

SECTION 01700

EXECUTION REQUIREMENTS

PART 2 – PRODUCTS

2.1 PATCHING MATERIALS

- A. New Materials: As specified in product sections; match existing products and work for patching and extending work.
- B. Type and Quality of Existing Products: Determine by inspecting and testing products where necessary, referring to existing work as a standard.
- C. Product Substitution: For any proposed change in materials, submit request for substitution described in Section 01600.

PART 3 – EXECUTION

3.1 EXAMINATION

- A. Verify that existing site conditions and substrate surfaces are acceptable for subsequent work. Start of work means acceptance of existing conditions.
- B. Verify that demolition is complete in alterations areas and areas are ready for installation of new work.
- C. Verify that existing substrate is capable of structural support or attachment of new work being applied or attached.
- D. Examine and verify specific conditions described in individual specification sections.
- E. Verify in field all measurements before confirming product orders or beginning fabrication, to minimize waste due to over-ordering or mis-fabrication.
- F. Verify that utility services are available, of the correct characteristics, and in the correct locations.
- G. Prior to Cutting: Examine existing conditions prior to commencing work, including elements subject to damage or movement during cutting and patching. After uncovering existing work, assess conditions affecting performance of work. Beginning of cutting or patching means acceptance of existing conditions.

3.2 PREPARATION

- A. Clean substrate surfaces prior to applying next material or substance.
- B. Seal cracks or openings of substrate prior to applying next material or substance.
- C. Apply manufacturer required or recommended substrate primer, sealer, or conditioner prior to applying any new material or substance in contact or bond.

3.3 PREINSTALLATION MEETINGS

- A. When required in individual specification sections, convene a pre-installation meeting at the site prior to commencing work of the section.
- B. Require attendance of parties directly affecting, or affected by, work of the specific section.
- C. Notify Architect four days in advance of meeting date.
- D. Prepare agenda and preside at meeting:
 - 1. Review conditions of examination, preparation and installation procedures.
 - 2. Review coordination with related work.
- E. Record minutes and distribute copies within two days after meeting to participants, with two copies to Architect, Owner, participants, and those affected by decisions made.

3.4 LAYING OUT THE WORK

- A. Verify locations of survey control points prior to starting work.
- B. Promptly notify Architect of any discrepancies discovered.
- C. Contractor shall locate and protect survey control and reference points.
- D. Control datum for survey is that established by Owner provided survey.
- E. Protect survey control points prior to starting site work; preserve permanent reference points during construction.

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EXECUTION REQUIREMENTS

- F. Promptly report to Architect the loss or destruction of any reference point or relocation required because of changes in grades or other reasons.
- G. Replace dislocated survey control points based on original survey control. Make no changes without prior written notice to Architect.
- H. Utilize recognized engineering survey practices.
- I. Establish a minimum of two permanent bench marks on site, referenced to established control points. Record locations, with horizontal and vertical data, on project record documents.
- J. Establish elevations, lines and levels. Locate and lay out by instrumentation and similar appropriate means:
 - 1. Site improvements including pavements; stakes for grading, fill and topsoil placement; utility locations, slopes, and invert elevations.
 - 2. Grid or axis for structures.
 - 3. Building foundation, column locations, and ground floor elevations.
- K. Periodically verify layouts by same means.
- L. Maintain a complete and accurate log of control and survey work as it progresses.
- M. On completion of foundation walls and major site improvements, prepare a certified survey illustrating dimensions, locations, angles, and elevations of construction and site work.

3.5 GENERAL INSTALLATION REQUIREMENTS

- A. Install products as specified in individual sections, in accordance with manufacturer's instructions and recommendations, and so as to avoid waste due to necessity for replacement.
- B. Make vertical elements plumb and horizontal elements level, unless otherwise indicated.
- C. Install equipment and fittings plumb and level, neatly aligned with adjacent vertical and horizontal lines, unless otherwise indicated.
- D. Make consistent texture on surfaces, with seamless transitions, unless otherwise indicated.
- E. Make neat transitions between different surfaces, maintaining texture and appearance.

3.6 CUTTING AND PATCHING

- A. Execute cutting and patching including excavation and fill to complete the work, to uncover work in order to install improperly sequenced work, to remove and replace defective or non-conforming work, to remove samples of installed work for testing when requested, to provide openings in the work for penetration of mechanical and electrical work, to execute patching to complement adjacent work, and to fit products together to integrate with other work.
- B. Execute work by methods to avoid damage to other work, and which will provide appropriate surfaces to receive patching and finishing. In existing work, minimize damage and restore to original condition.
- C. Employ original installer to perform cutting for weather exposed and moisture resistant elements, and sight exposed surfaces.
- D. Cut rigid materials using masonry saw or core drill. Pneumatic tools not allowed without prior approval.
- E. Restore work with new products in accordance with requirements of Contract Documents.
- F. Fit work air tight to pipes, sleeves, ducts, conduit, and other penetrations through surfaces.
- G. At penetrations of fire rated walls, partitions, ceiling, or floor construction, completely seal voids with fire rated material in accordance with Section 07840, to full thickness of the penetrated element.
- H. Refinish surfaces to match adjacent finish. For continuous surfaces, refinish to nearest intersection or natural break. For an assembly, refinish entire unit.
- I. Make neat transitions. Patch work to match adjacent work in texture and appearance. Where new work abuts or aligns with existing, perform a smooth and even transition.
- J. In addition to contract requirements, upon written instructions of Architect.
 - 1. Uncover work to provide for observation of covered work.
 - 2. Remove samples of installed materials for testing.
- K. Do not endanger work by cutting or altering work or any part of it.
- L. Do not cut or alter work without written consent of Architect.

SECTION 01700

EXECUTION REQUIREMENTS

- M. Patch or replace surfaces that are damaged, lifted, discolored, or showing other imperfections due to patching work. Repair substrate prior to patching finish. Finish patches to produce uniform finish and texture over entire area. When finish cannot be matched, refinish entire surface to nearest intersections.

3.7 PROGRESS CLEANING

- A. Maintain areas free of waste materials, debris, and rubbish. Maintain site in a clean and orderly condition.
- B. Remove debris and rubbish from pipe chases, plenums, attics, crawl spaces, and other closed or remote spaces, prior to enclosing the space.
- C. Broom and vacuum clean interior areas prior to start of surface finishing, and continue cleaning to eliminate dust.
- D. Collect and remove waste materials, debris, and trash/rubbish from site periodically and dispose off-site; do not burn or bury.

3.8 PROTECTION OF INSTALLED WORK

- A. Protect installed work from damage by construction operations.
- B. Provide special protection where specified in individual specification sections.
- C. Provide temporary and removable protection for installed products. Control activity in immediate work area to prevent damage.
- D. Provide protective coverings at walls, projections, jambs, sills, and soffits of openings.
- E. Protect finished floors, stairs, and other surfaces from traffic, dirt, wear, damage, or movement of heavy objects, by protecting with durable sheet materials.
- F. Prohibit traffic or storage upon waterproofed or roofed surfaces. If traffic or activity is necessary, obtain recommendations for protection from waterproofing or roofing material manufacturer.
- G. Prohibit traffic from landscaped areas.
- H. Remove protective coverings when no longer needed; reuse or recycle plastic coverings if possible.

3.9 STARTING SYSTEMS

- A. Coordinate schedule for start-up of various equipment and systems with Architect and Owner's Representative..
- B. Notify Architect and owner two days prior to start-up of each item.
- C. Verify that each piece of equipment or system has been checked for proper lubrication, drive rotation, belt tension, control sequence, and for conditions which may cause damage.
- D. Verify tests, meter readings, and specified electrical characteristics agree with those required by the equipment or system manufacturer.
- E. Verify that wiring and support components for equipment are complete and tested.
- F. Execute start-up under supervision of applicable Contractor personnel and manufacturer's representative in accordance with manufacturers' instructions.
- G. When specified in individual specification Sections, require manufacturer and/or equipment supplier to provide authorized representative to be present at site to inspect, check, and approve equipment or system installation prior to start-up, and to supervise placing equipment or system in operation.
- H. Submit a written report that equipment or system has been properly installed and is functioning correctly.

3.10 DEMONSTRATION AND INSTRUCTION

- A. Demonstrate operation and maintenance of products to Owner's personnel two weeks prior to date of Substantial Completion.
- B. Demonstrate start-up, operation, control, adjustment, trouble-shooting, servicing, maintenance, and shutdown of each item of equipment at scheduled time, at equipment location.
- C. For equipment or systems requiring seasonal operation, perform demonstration for other season within six months.

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EXECUTION REQUIREMENTS

- D. Provide a qualified person who is knowledgeable about the Project to perform demonstration and instruction of owner personnel.
- E. Utilize operation and maintenance manuals as basis for instruction. Review contents of manual with Owner's personnel in detail to explain all aspects of operation and maintenance.
- F. Prepare and insert additional data in operations and maintenance manuals when need for additional data becomes apparent during instruction.
- G. The amount of time required for instruction on each item of equipment and system is that specified in individual sections.
- H. Air and Water Testing, Adjusting and Balancing
 - 1. Testing, adjusting and balancing will be part of the mechanical contract.
 - 2. The mechanical subcontractor will perform services specified in Division 15.
 - 3. Reports will be submitted by the Mechanical subcontractor to the Architect indicating observation and results of test and indicating compliance or non-compliance with the specified requirements and with the requirements of the Contract Documents.

3.11 ADJUSTING

- A. Adjust operating products and equipment to ensure smooth and unhindered operation.
- B. Testing, adjusting, and balancing HVAC systems: See Section 15990 and 01400.

3.12 FINAL CLEANING

- A. Execute final cleaning prior to final project assessment.
 - 1. Clean areas to be occupied by Owner prior to final completion before Owner occupancy.
- B. Use cleaning materials that are non-hazardous.
- C. Clean interior and exterior glass, surfaces exposed to view; remove temporary labels, stains and foreign substances, polish transparent and glossy surfaces, vacuum carpeted and soft surfaces.
- D. Clean equipment and fixtures to a sanitary condition with cleaning materials appropriate to the surface and material being cleaned.
- E. Clean filters of operating equipment.
- F. Clean debris from roofs, gutters, downspouts, and drainage systems.
- G. Clean site; sweep paved areas, rake clean landscaped surfaces.
- H. Remove waste, surplus materials, trash/rubbish, and construction facilities from the site; dispose of in legal manner; do not burn or bury.
- I. Contractor provide final cleaning at completion of work, or at such other times as directed by the Architect, remove all waste, debris, rubbish, tools, equipment, machinery and surplus materials. Clean all sight exposed surfaces; leave work clean and ready for occupancy.
- J. Safety Requirements
 - 1. Standards: Maintain project in accord with following safety and insurance standards:
 - a. Federal and state regulations.
 - b. National Fire Protection Association (NFPA).
 - 2. Hazards Control:
 - a. Store volatile wastes in covered metal containers and remove from premises daily.
 - b. Prevent accumulation of wastes which create hazardous conditions.
 - c. Provide adequate ventilation during use of volatile or noxious substances.
 - 3. Conduct cleaning and disposal operations to comply with Federal and State anti-pollution laws.
 - a. Do not burn or bury rubbish and waste materials on project site.
 - b. Do not dispose of volatile wastes such as mineral spirits, oil or paint thinner in storm or sanitary drains.
 - c. Do not dispose of wastes into streams or waterways.
- K. Submittals
 - 1. Manufacturer's recommendations for cleaning specified products.
 - 2. Proposed cleaning products for products where manufacturer's recommendations are not specified.

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EXECUTION REQUIREMENTS

- L. Materials
 - 1. Select and use all cleaning materials and equipment with care to avoid scratching, marring, defacing, staining or discoloring surfaces cleaned.
 - 2. Use only cleaning materials recommended by manufacturer of surface to be cleaned.
 - 3. Use cleaning materials only on surfaces recommended by cleaning material manufacturer.
- M. Final Cleaning
 - 1. Employ experienced workers or professional cleaners for final cleaning.
 - 2. Remove grease, dust, dirt, stains, labels, fingerprints, protection and other foreign materials from sight-exposed finished surfaces.
 - a. In preparation for substantial completion or occupancy, conduct final inspection of sight-exposed surfaces, and of concealed spaces to insure performance.
 - 3. Repair, patch and touch up marred surfaces to specified finish, to match adjacent surfaces.
 - 4. Soft broom clean all exposed concrete surfaces clean; other paved areas with soft or stiff broom as directed. Rake clean other surfaces on grounds.
 - 5. Sweep and mop clean all resilient, quarry and ceramic flooring.
 - 6. Vacuum all carpeting.
 - 7. Remove ice and snow from access to buildings.
 - 8. Replace air handling and conditioning filters if units were operated during construction.
 - 9. Clean all ductwork used for temporary heating.
 - 10. Clean windows and mirrors to be free from labels, dust, fingerprints and other foreign materials.
 - 11. Maintain finally cleaned areas until project, or designated portion thereof, is accepted by Owner.

3.13 CLOSEOUT PROCEDURES

- A. Make submittals that are required by governing or other authorities.
 - 1. Provide copies to Architect and Owner.
- B. Contractor to determine items to be listed for completion or correction in Contractor's Notice of Substantial Completion.
- C. Notify Architect when work is considered ready for Substantial Completion.
- D. Submit written certification that Contract Documents have been reviewed, work has been inspected, and that work is complete in accordance with Contract Documents and ready for Architect's review.
- E. Substantial Completion Meeting will be scheduled by Architect. Architect will issue notice of meeting.
 - 1. Agenda will consist of the inspection, discussion of the punch list, determination of final completion dates, and the date and time the Owner will take occupancy. Architect will also review the requirements for contractor closeout in accord with the contract documents.
 - 2. Upon completion of this meeting, the Architect shall prepare the Certificate of Substantial Completion with the completed punch list and forward the package to the Contractor.
- F. Owner will occupy all of the building as specified in Section 01100.
- G. Contractor will correct items of work listed in punch list and comply with requirements for access to Owner-occupied areas.
- H. Notify Architect when work is considered finally complete.
- I. Accompany Architect on final inspection.
- J. Complete items of work determined by Architect's final inspection.

END OF SECTION

SECTION 01780

CLOSEOUT SUBMITTALS

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Project Record Documents.
- B. Operation and Maintenance Data.
- C. Warranties and bonds.

1.2 RELATED SECTIONS

- A. Conditions of the Contract: Performance bond and labor and material payment bonds, warranty, and correction of work.
- B. Section 01300 - Administrative Requirements: Submittals procedures, shop drawings, product data, and samples.
- C. Section 01700 - Execution Requirements: Contract closeout procedures.
- D. Individual Product Sections: Specific requirements for operation and maintenance data.
- E. Individual Product Sections: Warranties required for specific products or Work.

1.3 SUBMITTALS

- A. Substantial Completion
 - 1. When Contractor considers work substantially complete, submit written declaration to Architect that work, or designated portion thereof, is substantially complete. Include list of items to be completed or corrected.
 - 2. Architect will make a preliminary inspection within seven business days after receipt of Contractor's declaration.
 - 3. Upon determining that work is substantially complete, Architect will:
 - a. Prepare a punch list of items to be completed or corrected, as determined by the inspection.
 - b. Prepare and process a certificate of substantial completion, containing:
 - 1) Date of substantial completion.
 - 2) Punch list of items to be completed or corrected.
 - 3) The time within which punch list items shall be completed or corrected.
 - 4) Date and time Owner will take occupancy of project or designated portion thereof.
 - 5) Responsibilities of Owner and Contractor for:
 - a) Insurance
 - b) Utilities.
 - c) Operation and maintenance of mechanical, electrical and other systems.
 - d) Maintenance and cleaning.
 - e) Security
 - 6) Signatures of:
 - a) Architect
 - b) Contractor.
 - c) Owner.
 - 4. Contractor:
 - a. Complete all work listed for completion or correction within designated time.
 - b. Perform final cleaning in accordance with 01700.
 - 5. At time of inspection, should substantial completion not be certified, complete the work and resubmit declaration in accord with Paragraph A.1 above.
- B. Final Completion
 - 1. Contractor:
 - a. Submit written declaration to Architect that:
 - 1) Work complies with all aspects of Contract Documents.
 - 2) All items on substantial completion punch list have been completed or corrected.
 - 3) All tools, construction equipment and surplus materials have been removed from site.
 - 4) Required surveys have been completed and verified.
 - 2. Architect will make final inspection with Contractor to ensure completion of all contract requirements.

SECTION 01780

CLOSEOUT SUBMITTALS

3. When Architect considers that all work is finally complete in accordance with contract document requirements, he will prepare and process closeout documents.
- C. Application for Final Payment
1. Contractor submit duly executed:
 - a. Final Affidavit and Sworn Statement.
 - b. Contractor's Final Waiver of Lien.
 - c. Separate releases of waivers of liens for all subcontractors, suppliers and others with lien rights against property of Owner, together with complete list of those parties.
 - d. Final accounting statement, reflecting all adjustments to contract sum.
 - 1) Original contract sum.
 - 2) Additions and deductions resulting from:
 - a) All change orders.
 - b) Deductions for uncorrected work.
 - c) Deductions for liquidated damages.
 - e. Total contract sum, as adjusted.
 - f. Previous payments.
 - g. Sum remaining due.
 2. Architect will process final statement in accordance with Conditions of the Contract.
- D. Project Record Documents: Submit documents to Architect with claim for final Application for Payment.
1. Accompany submittal with transmittal letter, in duplicate, containing:
 - a. Date.
 - b. Project title and number.
 - c. Contractor's name and address.
 - d. Title and number of each record document.
 2. Certification that each document submitted is complete and accurate.
 - a. Signature of contractor, or his authorized representative.
 3. Submit 1 copy of completed documents 15 days prior to final inspection. This copy will be reviewed and returned after final inspection, with Architect comments. Revise content of all document sets as required prior to final submission.
 4. Submit one hard copy set and two Compact Disc containing electronic copies (in PDF file format) of revised final documents in final form within 10 days after final inspection.
- E. Operation and Maintenance Data:
1. The contractor shall cause each mechanical and electrical subcontractor to provide the Contractor with two hard copies and one electronic copy of all operating manuals at the time of delivery of each major piece of equipment.
 2. Submit two copies of preliminary draft or proposed formats and outlines of contents before start of Work. Architect will review draft and return one copy with comments.
 3. For equipment, or component parts of equipment put into service during construction and operated by Owner, submit completed documents within ten days after acceptance.
 4. Submit 1 copy of completed documents 15 days prior to final inspection. This copy will be reviewed and returned after final inspection, with Architect comments. Revise content of all document sets as required prior to final submission.
 5. Submit two hard copy sets and two Compact Disc containing electronic copies (in PDF file format) of revised final documents in final form within 10 days after final inspection.
- F. Warranties and Bonds:
1. For equipment or component parts of equipment put into service during construction with Owner's permission, submit documents within ten days after acceptance.
 2. Make other submittals within ten days after Date of Substantial Completion, prior to final Application for Payment.
 3. For items of Work for which acceptance is delayed beyond Date of Substantial Completion, submit within ten days after acceptance, listing the date of acceptance as the beginning of the warranty period.

SECTION 01780

CLOSEOUT SUBMITTALS

4. Because the warranty period begins with the issuance of the final payment from The District to the general contractor, all warranties should include the verbiage "...for a period of (X) year(s) after the date The District issues the final payment to the General Contractor..."

PART 2 – PRODUCTS – NOT USED

PART 3 – EXECUTION

3.1 PROJECT RECORD DOCUMENTS

- A. Contractor and all subcontractors shall maintain an accurate record of deviations and changes from the Contract Documents which occur in the work.
- B. Indicate all such deviations and changes on a record set of the Contract Documents and turn same over to the Architect and Owner upon completion of the Work all such documents and information such as final shop drawings and sketches, marked prints and similar data indicating the as-built conditions.
- C. Create an electronic copy of all approved Project Record Documents in PDF file format and deliver to Architect and Owner on Compact Disc.
- D. Compact Discs: High quality CD-R format Compact Disc formatted for use by Microsoft Windows based computers. Rewriteable Compact Discs will not be accepted. Provide labels on all Compact Discs listing the Owner's name, Project name, Contractor's name, Date of Submittal, and the title "Project Record Documents".
- E. Maintain on site one set of the following record documents; record actual revisions to the Work:
 1. Drawings.
 2. Project Manual.
 3. Interpretations and supplemental instructions.
 4. Specifications.
 5. Addenda.
 6. Change Orders and other modifications to the Contract.
 7. Reviewed shop drawings, product data, and samples.
 8. Manufacturer's instruction for assembly, installation, and adjusting.
 9. Other modifications to contract.
 10. Field test records.
 11. All schedules.
 12. Correspondence file.
- F. Ensure entries are complete and accurate, enabling future reference by Owner.
- G. Store record documents separate from documents used for construction.
- H. Record information concurrent with construction progress.
- I. File documents in format in accord with Project Manual Table of Contents.
- J. Do not use record documents for field construction purposes.
- K. Make documents available at all times for inspection by Architect and Owner.
- L. Plans and sections of all concealed work, particularly concealed piping and conduit, and deviations from conditions shown on the contract drawings, shall be shown and dimensioned on the "as-built" drawings.
- M. Contractor shall develop layout drawings for all concealed work that is schematically indicated on contract drawings.
- N. Provide red colored pencils or felt marking pens for marking devices.
- O. Do not permanently conceal any work until specified information has been recorded.
- P. Specifications: Legibly mark and record at each product section description of actual products installed, including the following:
 1. Manufacturer's name and product model and number.
 2. Product substitutions or alternates utilized.
 3. Changes made by Change Order or Field Order.
 4. Other matters not originally specified.

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CLOSEOUT SUBMITTALS

- Q. Label each record document "PROJECT RECORD DOCUMENTS" in large print. Keep record documents current.
- R. Record Drawings and Shop Drawings: Legibly mark each item to record actual construction including:
 - 1. Measured depths of foundations in relation to finish first floor datum.
 - 2. Measured horizontal and vertical locations of underground utilities and appurtenances, referenced to permanent surface improvements.
 - 3. Measured locations of internal utilities and appurtenances concealed in construction, referenced to visible and accessible features of the Work.
 - 4. Field changes of dimension and detail.
 - 5. Changes made by change order.
 - 6. Details not on original Contract drawings.
- S. Shop Drawings: Maintain as record documents; legibly annotate drawings to record changes made after review.
- T. Completed Work Survey: Requirements specified in Section 01700 - Execution Requirements.

3.2 OPERATION AND MAINTENANCE DATA

- A. Compile product data and related information appropriate for Owner's maintenance and operation of products and equipment provided under the Contract.
- B. For Each Product or System: List names, addresses and telephone numbers of Subcontractors and suppliers, including local source of supplies and replacement parts.
- C. Product Data: Mark each sheet to clearly identify specific products and component parts, and data applicable to installation. Delete inapplicable information.
- D. Drawings: Supplement product data to illustrate relations of component parts of equipment and systems, to show control and flow diagrams. Coordinate drawings with information in Product Record Documents to assure correct illustration of completed installation. Do not use Project Record Documents as maintenance drawings.
- E. Typed Text: As required to supplement product data. Provide logical sequence of instructions for each procedure, incorporating manufacturer's instructions.
- F. Warranty, Bond, and Service Contract: Provide information sheet for Owner's personnel with proper procedures in event of failure and instances which might affect validity of warranties of bonds.

3.3 OPERATION AND MAINTENANCE DATA FOR MATERIALS AND FINISHES

- A. Submit two hard copies and two Compact Discs with electronic copies (in PDF file format) of complete manual in final form.
- B. For Each Product, Applied Material, and Finish:
 - 1. Product data, with catalog number, size, composition, and color and texture designations.
 - 2. Information for re-ordering custom manufactured products.
- C. Instructions for Care and Maintenance: Manufacturer's recommendations for cleaning agents and methods, precautions against detrimental cleaning agents and methods, and recommended schedule for cleaning and maintenance.
- D. Moisture protection and weather-exposed products: Include product data listing applicable reference standards, chemical composition, and details of installation. Provide recommendations for inspections, maintenance, and repair.
- E. Additional information as specified in individual product specification sections.
- F. Provide a listing in Table of Contents for design data, with tabbed fly sheet and space for insertion of data.

3.4 OPERATION AND MAINTENANCE DATA FOR EQUIPMENT AND SYSTEMS

- A. Submit two hard copies and two Compact Discs with electronic copies (in PDF file format) of complete manual in final form.
- B. For Each Item of Equipment and Each System:
 - 1. Description of unit or system, and component parts.
 - 2. Identify function, normal operating characteristics, and limiting conditions.

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CLOSEOUT SUBMITTALS

3. Include performance curves, with engineering data and tests.
4. Complete nomenclature and model number of replaceable parts.
- C. Panelboard Circuit Directories: Provide electrical service characteristics, controls, and communications; typed.
- D. Include color coded wiring diagrams as installed.
- E. Operating Procedures: Include start-up, break-in, and routine normal operating instructions and sequences. Include regulation, control, stopping, shut-down, and emergency instructions. Include summer, winter, and any special operating instructions.
- F. Maintenance Requirements: Include routine procedures and guide for preventative maintenance and trouble shooting; disassembly, repair, and reassembly instructions; and alignment, adjusting, balancing, and checking instructions.
- G. Provide servicing and lubrication schedule, and list of lubricants required.
- H. Include manufacturer's printed operation and maintenance instructions.
- I. Include sequence of operation by controls manufacturer.
- J. Provide original manufacturer's parts list, illustrations, assembly drawings, and diagrams required for maintenance.
- K. Provide control diagrams by controls manufacturer as installed.
- L. Provide Contractor's coordination drawings, with color coded piping diagrams as installed.
- M. Provide charts of valve tag numbers, with location and function of each valve, keyed to flow and control diagrams.
- N. Provide list of original manufacturer's spare parts, current prices, and recommended quantities to be maintained in storage.
- O. Include test and balancing reports.
- P. Additional Requirements: As specified in individual product specification sections.

3.5 OPERATION AND MAINTENANCE MANUALS

- A. Prepare instructions and data by personnel experienced in maintenance and operation of described products.
- B. Prepare data in the form of an instructional manual.
- C. Submit one copy of completed instruction manual 15 business days prior to final inspection or acceptance.
 1. Copy will be returned after final inspection or acceptance, with comments.
- D. Binders: Commercial quality, 8-1/2 x 11 inch three D side ring binders with durable plastic covers; 2 inch maximum ring size. When multiple binders are used, correlate data into related consistent groupings.
- E. Compact Discs: High quality CD-R format Compact Disc formatted for use by Microsoft Windows based computers. Rewriteable Compact Discs will not be accepted. Provide labels on all Compact Discs listing the Owner's name, Project name, Contractor's name, Date of Submittal, and the title "Operation and Maintenance Manuals".
- F. Cover: Identify each binder with typed or printed title OPERATION AND MAINTENANCE INSTRUCTIONS; identify title of Project; identify subject matter of contents.
- G. Provide tabbed dividers for each separate product and system, with typed description of product and major component parts of equipment.
- H. Text: Manufacturer's printed data, or typewritten data on 24 pound paper.
- I. Drawings: Provide with reinforced punched binder tab. Bind in with text; fold larger drawings to size of text pages.
- J. Arrange content by systems under section numbers and sequence of Table of Contents of this Project Manual.
- K. Contents: Prepare a Table of Contents for each volume, with each product or system description identified, in three parts as follows:
 1. Part 1: Directory, listing names, addresses, and telephone numbers of Architect, Contractor, Subcontractors, and major equipment suppliers.
 2. Part 2: Operation and maintenance instructions arranged by system and subdivided by specification section. For each category, identify names, addresses, and telephone numbers of Subcontractors and suppliers. Identify the following:

SECTION 01780

CLOSEOUT SUBMITTALS

- a. Significant design criteria.
 - b. List of equipment.
 - c. Parts list for each component.
 - d. Operating instructions.
 - e. Maintenance instructions for equipment and systems.
 - f. Maintenance instructions for special finishes, including recommended cleaning methods and materials, and special precautions identifying detrimental agents.
3. Part 3: Project documents and certificates, including the following:
 - a. Shop drawings and product data.
 - b. Air and water balance reports.
 - c. Certificates.
 - d. Photocopies of warranties and bonds.
 - L. Provide a listing in Table of Contents for design data, with tabbed dividers and space for insertion of data.
 - M. Table of Contents: Provide title of Project; names, addresses, and telephone numbers of Architect, Consultants, and Contractor with name of responsible parties; schedule of products and systems, indexed to content of the volume.

3.6 WARRANTIES AND BONDS

- A. Obtain warranties and bonds, executed in duplicate by responsible Subcontractors, suppliers, and manufacturers, within ten days after completion of the applicable item of work. Except for items put into use with Owner's permission, leave date of beginning of time of warranty until the Date of Substantial completion is determined.
- B. Verify that documents are in proper form, contain full information, and are notarized.
- C. Co-execute submittals when required.
- D. Retain warranties and bonds until time specified for submittal.
- E. Manual: Bind in commercial quality 8-1/2 x 11 inch three D side ring binders with durable plastic covers and provide electronic copies of all warranties and bonds in PDF file format on two Compact Discs.
- F. Compact Discs: High quality CD-R format Compact Disc formatted for use by Microsoft Windows based computers. Rewriteable Compact Discs will not be accepted. Provide labels on all Compact Discs listing the Owner's name, Project name, Contractor's name, Date of Submittal, and the title "Warranties and Bonds".
- G. Binder Cover: Identify each binder with typed or printed title WARRANTIES AND BONDS, with title of Project; name, address and telephone number of Contractor and equipment supplier; and name of responsible company principal.
- H. Table of Contents: Neatly typed, in the sequence of the Table of Contents of the Project Manual, with each item identified with the number and title of the specification section in which specified, and the name of product or work item.
- I. Separate each warranty or bond with index tab sheets keyed to the Table of Contents listing. Provide full information, using separate typed sheets as necessary. List Subcontractor, supplier, and manufacturer, with name, address, and telephone number of responsible principal.

END OF SECTION

SECTION 02315

EXCAVATION

PART 1 – GENERAL

1.1 SECTION INCLUDES

- A. Excavating for building volume below grade, footings, pile caps, slabs-on-grade, paving, and site structures.
- B. Removal of unsuitable materials under building structure: Remove all unsuitable materials to a depth of _____ below subgrade. All soils with a bearing capacity of less than 4,000 psi are considered unsuitable.
- C. Trenching for utilities outside the building to utility main connections.
- D. Installation and maintenance of erosion control facilities, including silt fence, straw bales, temporary sediment pond and temporary riser pipe.

1.2 RELATED SECTIONS

- A. Section 00220-Geotechnical report: bore hole locations and findings of subsurface materials. This document is for reference only and is not a part of the Contract Documents.
- B. Section 02316 - Fill and Backfill: Fill materials, filling, and compacting.

1.3 PROJECT CONDITIONS

- A. Verify that survey bench mark and intended elevations for the Work are as indicated.
- B. Protect bench marks, survey control points, existing structures, fences, sidewalks, paving, and curbs from excavating equipment and vehicular traffic.

PART 2 – PRODUCTS

2.1 EROSION CONTROL MATERIALS

- A. Refer to Civil Drawings.

PART 3 – EXECUTION

3.1 PREPARATION

- A. Identify required lines, levels, contours, and datum locations.
- B. See Section 02310 for additional requirements.
- C. Locate, identify, and protect utilities that remain and protect from damage.
- D. Notify utility company to remove and relocate utilities.

3.2 EXCAVATING

- A. Underpin adjacent structures which may be damaged by excavating work.
- B. Excavate to accommodate building foundations, slabs on grade, paving, site structures, and construction operations.
- C. Notify Architect of unexpected subsurface conditions and discontinue affected Work in area until notified to resume work.
- D. Do not interfere with 45 degree bearing splay of foundations.
- E. Hand trim excavations. Remove loose matter.
- F. Remove lumped subsoil, boulders, and rock up to 1/3 cu yd measured by volume.
- G. Correct areas that are over-excavated and load-bearing surfaces that are disturbed; see Section 02316.
- H. Grade top perimeter of excavation to prevent surface water from draining into excavation.
- I. Compact disturbed load-bearing soil in direct contact with foundations to required bearing capacity. Remove and replace unsuitable material or materials not capable of compaction in place and fill in accordance with Section 02316.
- J. Remove excavated material that is unsuitable for re-use from site.
- K. Remove excess excavated material from site.

SECTION 02315

EXCAVATION

3.3 FIELD QUALITY CONTROL

- A. See Section 01400 - Quality Requirements, for general requirements for field inspection and testing.
- B. Provide for visual inspection of load-bearing excavated surfaces before placement of foundations.

3.4 PROTECTION

- A. Prevent displacement of banks and keep loose soil from falling into excavation; maintain soil stability.
- B. Protect bottom of excavations and soil adjacent to and beneath foundation from freezing.

END OF SECTION

SECTION 02316

FILL AND BACKFILL

PART 1 – GENERAL

1.1 SECTION INCLUDES

- A. Filling, backfilling, and compacting for building volume below grade, footings, slabs-on-grade, paving, site structures, and utilities within the building.
- B. Backfilling and compacting for utilities outside the building to utility main connections.
- C. Filling holes, pits, and excavations generated as a result of removal (demolition) operations.

1.2 RELATED SECTIONS

- A. Section 02315 - Excavation: Removal and handling of soil to be re-used.
- B. Section 03300 - Cast-In-Place Concrete.

1.3 UNIT PRICES

- A. See Section 01270 - Unit Prices, for general requirements applicable to unit prices for earthwork.
- B. Structural Fill: Applies to Unit Price CA-6.
 - 1. Measurement Method: By the cubic yard.
 - 2. Includes: Excavating existing soil, stockpiling, scarifying substrate surface, removing existing material from site, preparing subgrade, placing where required, and compacting.
- C. Graded Granular Fill: Applies to Unit Price CA-6.
 - 1. Measurement Method: By the cubic yard.
 - 2. Includes: Excavating existing material, stockpiling, scarifying substrate surface, removing existing material from site, preparing subgrade, placing where required, and compacting.
- D. Open Granular Fill: Applies to Unit Price CA-7.
 - 1. Measurement Method: By the cubic yard.
 - 2. Includes: Excavating existing material, stockpiling, scarifying substrate surface, removing existing material from site, preparing subgrade, placing where required, and compacting.

1.4 REFERENCES

- A. Unless otherwise noted the most current issue of the reference shall be used.
- B. Illinois Department of Transportation (IDOT): Standard Specifications for Road and Bridge Construction.
- C. ASTM C 136 - Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates.
- D. ASTM D 698 - Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft³).
- E. ASTM D 1556 - Standard Test Method for Density and Unit Weight of Soil in Place by the Sand-Cone Method.
- F. ASTM D 2167 - Standard Test Method for Density and Unit Weight of Soil in Place by the Rubber Balloon Method.
- G. ASTM D 2487 - Standard Practice for Classification of Soils for Engineering Purposes (Unified Soil Classification System).
- H. ASTM D 2922 - Standard Test Methods for Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth).
- I. ASTM D 3017 - Standard Test Method for Water Content of Soil and Rock in Place by Nuclear Methods (Shallow Depth).

1.5 DEFINITIONS

- A. Finish Grade Elevations: Indicated on drawings.
- B. Subgrade Elevations: 6 inches below finish grade elevations indicated on drawings, unless otherwise indicated.
- C. SOIL MATERIALS:
 - 1. General: Provide approved borrow soil materials from off-site when sufficient approved soil materials are not available from excavations.

SECTION 02316

FILL AND BACKFILL

2. Satisfactory Soil Materials: ASTM D2487 soil classification groups CL, GC GW, GP, GM, SW, SP, SC and SM, free of rock or gravel larger than 2 inches (50 mm) in any dimension, debris, waste, frozen materials, vegetation and other deleterious matter and as per AASHTO T180 and IDOT references above.
3. Unsatisfactory Soil Materials: ASTM D2487 soil classification groups ML, MH, CH, OL, OH and PT and as per AASHTO T180 and IDOT references above.
4. Subsoil Structural Fill: Select site excavated subsoil or approved off-site imported inorganic materials meeting the following requirements:
 - a. Graded
 - b. Free of lumps or rocks greater than three inches in size.
 - c. Free of roots and other organic materials.
 - d. Conforming to ASTM D2487 group symbol CL.

1.6 SUBMITTALS

- A. See Section 01300 - Administrative Requirements, for submittal procedures.
- B. Samples: 5 lb sample of each type of fill; submit in air-tight containers to testing laboratory.
- C. Fill Composition Test Reports: Results of laboratory tests on proposed and actual materials used.
 1. Test Reports: In addition to test reports required under field quality control, submit the following:
 - a. Laboratory analysis of each soil material proposed for fill and backfill from on-site and borrowed sources.
 - b. One optimum moisture-maximum density curve for each soil material.
 - c. Report of actual unconfined compressive strength and/or results of bearing tests.
- D. Compaction Density Test Reports.

1.7 PROJECT CONDITIONS

- A. Provide sufficient quantities of fill to meet project schedule and requirements. When necessary, store materials on site in advance of need.
- B. When fill materials need to be stored on site, locate stockpiles where designated.
 1. Separate differing materials with dividers or stockpile separately to prevent intermixing.
 2. Prevent contamination.
 3. Protect stockpiles from erosion and deterioration of materials.
- C. Verify that survey bench marks and intended elevations for the Work are as indicated.

PART 2 – PRODUCTS

2.1 FILL MATERIALS

- A. General Fill: Satisfactory soil materials as noted in definitions above from Subsoil excavated on-site or from off-site source.
 1. Graded.
 2. Free of lumps larger than 3 inches, rocks larger than 2 inches except where permitted by sieve analysis, and debris.
 3. Free from all organic materials, roots, black dirt, shale and chert.
- B. Structural Granular Fill - Fill Type IDOT Designation CA-1: Angular crushed stone, conforming to Illinois Department of Transportation (IDOT): Standard Specifications for Road and Bridge Construction, Latest Edition. Free from Chats, Slag of any designation, Chert, Pit or Bank Run materials and Novaculite Gravel.
 1. CA-1 Composition passing sieve size and percentage under ASTM C 136: 3 inch 95 ± 5 %; 2 inch 60 ± 15 %; 1-1/2 inch, 50 ± 15; 1 inch, 3 ± 3 %.
 2. Free of organic material.
- C. Concrete for Fill: Lean concrete.

SECTION 02316

FILL AND BACKFILL

- D. Graded Granular Fill - Fill Type IDOT Designation CA-6: Angular crushed stone, conforming to Illinois Department of Transportation (IDOT): Standard Specifications for Road and Bridge Construction, Latest Edition. Free from Chats, Slag of any designation, Chert, Pit or Bank Run materials and Novaculite Gravel.
 - 1. CA-6 Composition passing sieve size and percentage under ASTM C 136: 1-1/2 inch, 100% ; 1 inch, 95 ± 5 % ; 1/2 inch, 75 ± 15%; No. 4 , 43 ± 13%; No. 16, 25 ± 15; No. 200 8 ± 4%
- E. Open Granular Fill - Fill Type IDOT Designation CA-7: Angular crushed stone; free of shale, clay, friable material and debris. Conforming to Illinois Department of Transportation (IDOT): Standard Specifications for Road and Bridge Construction, Latest Edition. Free from Chats, Slag of any designation, Chert, Pit or Bank Run materials and Novaculite Gravel.
 - 1. CA-7 Composition passing sieve size and percentage under ASTM C 136: 1-1/2 inch, 100%; 1 inch, 95 ± 5 %; 1/2 inch, 45 ± 15%; No. 4, 5 ± 5%.
- F. Sand: Natural river or bank sand; free of silt, clay, loam, friable or soluble materials, and organic matter conforming to IDOT designation FA-1.
- G. Topsoil - Topsoil excavated on-site or from off-site borrow.
 - 1. Graded and pulverized.
 - 2. Free of roots, rocks larger than 1/4 inch, subsoil, debris, large weeds and foreign matter.
 - 3. Conforming to ASTM D2487 Group Symbol OH.

2.2 ACCESSORIES

- A. Geotextile Fabric: Non-biodegradable, woven conforming to IDOT Standard Specification for Road and Bridge Construction for intended use.

2.3 SOURCE QUALITY CONTROL

- A. See Section 01400 - Quality Requirements, for general requirements for testing and analysis of soil material.
- B. If tests indicate materials do not meet specified requirements, change material and retest.
- C. Provide materials of each type from same source throughout the Work.
- D. CA-7 shall NOT be substituted for CA-6 without exception. CA-7 is not considered to be a self compacting material and must be compacted to meet or exceed project requirements.
- E. Pea gravel shall not be substituted for FA-1 or any other aggregate material without express written permission of the Architect of Record--consultant approval is not sufficient.
- F. The use of bank run, spherical aggregates, or other unspecified aggregate materials is strictly prohibited. No substitution shall be permitted.

PART 3 – EXECUTION

3.1 EXAMINATION

- A. Identify required lines, levels, contours, and datum locations.
- B. See Section 02310 for additional requirements.
- C. Verify subdrainage, damp proofing, or waterproofing installation has been inspected.
- D. Verify structural ability of unsupported walls to support imposed loads by the fill.

3.2 PREPARATION

- A. Scarify subgrade surface to a depth of 6 inches to identify soft spots.
- B. Cut out soft areas of subgrade not capable of compaction in place. Backfill with general fill and recompact.
- C. Compact subgrade to density equal to or greater than requirements for subsequent fill material.
- D. If density or compaction requirements for subgrade can not be achieved, disc, aerate and recompact subgrade for a minimum depth of 10 inches.
- E. Until ready to fill, maintain excavations and prevent loose soil from falling into excavation.

SECTION 02316

FILL AND BACKFILL

3.3 FILLING

- A. Fill to contours and elevations indicated using unfrozen materials.
- B. Employ a placement method that does not disturb or damage other work.
- C. Systematically fill to allow maximum time for natural settlement. Do not fill over porous, wet, frozen or spongy subgrade surfaces.
- D. Maintain optimum moisture content of fill materials to attain required compaction density.
- E. Granular Fill: Place and compact materials in equal continuous layers not exceeding 8 inches compacted depth.
- F. General Fill: Place and compact material in equal continuous layers not exceeding 12 inches compacted depth.
- G. Slope grade away from building minimum 2 inches in 10 ft, unless noted otherwise. Make gradual grade changes. Blend slope into level areas.
- H. Correct areas that are over-excavated.
 - 1. Other areas: Use fill required at specific location, flush to required elevation, compacted to minimum 95 percent Modified Proctor.
- I. Compaction Density Unless Otherwise Specified or Indicated: As listed in Fill at Specific Locations.
- J. Reshape and re-compact fills subjected to vehicular traffic.

3.4 FILL AT SPECIFIC LOCATIONS

- A. Structural Fill at areas designated by Architect/Engineer:
 - 1. Use Fill Type CA-1.
 - 2. Maximum depth per lift: 6 inches, compacted.
 - 3. Compact to minimum 95 percent Modified Proctor.
- B. Under Interior Slabs-On-Grade:
 - 1. Use graded Fill Type CA-6.
 - 2. Depth: minimum 6 inches compacted.
 - 3. Compact to 95 percent Modified Proctor.
- C. At Foundation Walls, Footings, and foundation related items:
 - 1. Use Fill Type CA-6.
 - 2. Fill up to subgrade elevation.
 - 3. Maximum depth per lift: 12 inches, compacted.
 - 4. Compact each lift to 95 percent Modified Proctor.
 - 5. Do not backfill against unsupported foundation walls.
 - 6. Backfill simultaneously on each side of unsupported foundation walls until supports are in place.
- D. Over Subdrainage Piping at Foundation Perimeter and Under Slabs:
 - 1. Bedding: Use open granular Fill Type CA-7. Fill to cover piping maximum of 18 inches above top edge of pipe or other items unless otherwise noted.
 - a. Cover drainage piping with CA-7 for maximum 18 inches.
 - b. Fill up to subgrade elevation with graded granular CA-6 in lifts not to exceed 8 compacted inches.
 - 2. Compact to 95 percent Modified Proctor.
- E. Over Buried Utility Piping, Conduits, and Duct Bank in Trenches except small diameter (2 inches or less) Polypropylene, Polyvinyl-flouridiene, polyethylene, polybutylene, and Chlorinated Polyvinyl Chloride (CPVC) piping where manufacturer does not permit angular stone:
 - 1. Under all paved areas and within 3 feet of paving:
 - a. Bedding: Use Fill Type CA-7. Fill to cover piping 8 inches above top edge of pipe or other items unless otherwise noted.
 - b. Cover with Fill Type CA-6.
 - c. Fill up to subgrade elevation.
 - d. Compact in maximum 8 inch lifts to 95 percent Modified Proctor.

SECTION 02316

FILL AND BACKFILL

2. Under all landscaped areas:
 - a. Bedding: Use Fill Type CA-7. Fill to cover piping 8 inches above top edge of pipe or other items unless otherwise noted.
 - b. Cover with general fill.
 - c. Fill up to subgrade elevation.
 - d. Compact in maximum 12 inch lifts to 85 percent Modified Proctor.
- F. Over Buried Utility Piping, Conduits, and Duct Bank in Trenches where small diameter (2 inches or less) Polypropylene, Polyvinyl-flouridiene, polyethylene, polybutylene, and Chlorinated Polyvinyl Chloride (CPVC) piping is present and the manufacturer does not permit angular stone:
 1. Under all paved areas and within 3 feet of paving:
 - a. Bedding: Use Fill Type FA-1. Fill to cover piping 8 inches above top edge of pipe or other items unless otherwise noted. Consolidate sand prior to placing CA-6 without restricting piping below.
 - b. Cover with Fill Type CA-6.
 - c. Fill up to subgrade elevation.
 - d. Compact in maximum 12 inch lifts to 95 percent Modified Proctor at surface.
 2. Under all landscaped areas:
 - a. Bedding: Use Fill Type FA-1. Fill to cover piping 8 inches above top edge of pipe or other items unless otherwise noted.
 - b. Cover with general fill.
 - c. Fill up to subgrade elevation.
 - d. Compact in maximum 12 inch lifts to 85 percent Modified Proctor.
- G. Base material under all paved areas:
 1. Use Fill Type CA-6.
 2. Depth: minimum as indicated on Drawings.
 3. Compact in maximum 6 inch lifts to 95 percent Modified Proctor.
- H. At Lawn Areas:
 1. Use general fill.
 2. Fill up to 6 inches below finish grade elevations.
 3. Compact to 85 percent Modified Proctor.
 4. See Section 02310 for topsoil placement.
- I. Around all Underground structures unless otherwise noted:
 1. Bedding: CA-7 Fill to cover piping 8 inches above top edge of pipe or other items unless otherwise noted.
 2. Cover with Fill Type CA-6.
 3. Fill up to subgrade elevation.
 4. Maximum compacted depth of each lift: 8 inches.
 5. Compact to 95 percent Modified Proctor.

3.5 TOLERANCES

- A. Top Surface of General Filling: Plus or minus 1 inch from required elevations.
- B. Top Surface of Filling Under Paved Areas: Plus or minus 1 inch from required elevations.

3.6 FIELD QUALITY CONTROL

- A. See Section 01400 - Quality Requirements, for general requirements for field inspection and testing.
- B. Perform compaction density testing on compacted fill in accordance with ASTM D1556, ASTM D2167, ASTM D2922, or ASTM D3017.
- C. Evaluate results in relation to compaction curve determined by testing uncompacted material in accordance with ASTM D 698 ("standard Proctor"), ASTM D 1557 ("modified Proctor"), or AASHTO T 180.

SECTION 02316

FILL AND BACKFILL

- D. If tests indicate work does not meet specified requirements, remove work, replace and retest.
- E. Frequency of Tests: 1 for each 2000 SF or fraction thereof per lift.
- F. Proof roll compacted fill at surfaces that will be under paving in the presence of the Testing Agency, Owner, Architect and local municipality. Proof roll with fully loaded 6-wheel dump truck. Areas with 1 inch deflection or greater shall be scarified, aerated, dried, recompact and retested. Contractor has the option to replace material in lieu of scarification, aeration, drying and recompaction at no cost to the owner.

3.7 CLEAN UP

- A. Remove unused stockpiled materials, leave area in a clean and neat condition. Grade stockpile area to prevent standing surface water. Restore any vegetation to original condition.

END OF SECTION

SECTION 02820

FENCES AND GATES

PART 1 – GENERAL

1.1 SECTION INCLUDES

- A. TYPE 1 - Chain link fence framework, fabric, and accessories with manual horizontal cantilevered slide gates.
- B. TYPE 2 – Ornamental steel fence framework and accessories with manual horizontal cantilevered slide gates.

1.2 REFERENCES

- A. Unless otherwise noted the most current issue of the reference shall be used.
- B. ASTM A 817 - Specification for Metallic-Coated Steel Wire for Chain Link Fence Fabric and Marcellled Tension Wire.
- C. ASTM A 824 - Specification for Metallic-Coated Steel Marcellled Tension Wire for Use With Chain Link.
- D. ASTM F 552 - Standard Terminology Relating to Chain Link Fencing.
- E. ASTM F 567 - Standard Practice for Installation of Chain Link Fence.
- F. ASTM F 626 - Specification for Fence Fittings.
- G. ASTM F 668 - Specification for Polymer Coated Chain Link Fence Fabric.
- H. ASTM F 934 - Specification for Standard Colors for Polymer-Coated Chain Link.
- I. ASTM 1043 - Specification for Strength and Protective Coatings of Metal Industrial Chain Link Fence Framework.
- J. ASTM F 1083 - Specification for Pipe, Steel, Hot-Dipped Zinc-Coated (Galvanized) Welded for Fence Structures.
- K. ASTM F 1184 - Specification for Industrial and Commercial Horizontal Slide Gates.
- L. ASTM F 1664 - Specification for Poly (Vinyl Chloride) (PVC) and Other Conforming Organic Polymer-Coated Steel Tension Wire Used with Chain-Link Fence.

1.3 SUBMITTALS

- A. Submit under provisions of Section 01300.
- B. Product Data: Manufacturer's data sheets on each product to be used, including:
 - 1. Material certifications in compliance with the specified material standards.
 - 2. Preparation instructions and recommendations.
 - 3. Storage and handling requirements and recommendations.
 - 4. Installation methods.
 - 5. Domestic certifications: Material certifications, Made in U.S.A., Buy American Act or Buy America when required.
- C. Shop Drawings: Plans and details indicating extent of fences, dimensions, cleared area, location of gates, elevation of fence and gates, details of attachments and footings.
- D. Selection Samples: For each finish product specified, two complete sets of color chips representing manufacturer's full range of available colors and patterns.
- E. Verification Samples: For each finish product specified, two samples, minimum size 6 inches square representing actual product, color, and patterns.

1.4 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company headquartered in the United States, having U.S. manufacturing plants with at least 5 years' experience manufacturing specification quality chain link fence products.
- B. Installer Qualifications: Company with demonstrated experience installing similar projects and products in accordance with ASTM F 567 and have at least 5 years' experience.
- C. Tolerances: Current published edition of ASTM material specifications tolerances apply. ASTM material specification tolerances supersede any conflicting tolerance.

SECTION 02820

FENCES AND GATES

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Store products in manufacturer's unopened packaging until ready for installation.
- B. Store and dispose of solvent-based materials, and materials used with solvent-based materials, in accordance with requirements of local authorities having jurisdiction.

PART 2 – PRODUCTS

2.1 MANUFACTURERS

- A. Acceptable Manufacturer:
 - 1. TYPE 1 - Wheatland Tube Company; 900 Haddon Ave., Collingswood, NJ 08108-2162. ASD. Toll Free Tel: (800) 257-8182. Tel: (856) 854-5400. Fax: (856) 858-5578. Email: marty.brett@wheatland.com. www.wheatland.com.
 - 2. TYPE 2 - Ameristar Fence Products - www.ameristarfence.com Basis of design is Montage 2; ornamental steel; Majestic design type; flush bottom rail treatment; 3-rail style.
 - 3. Substitutions: See Section 016000 - Product Requirements.

*****TYPE 1*****

2.2 APPLICATIONS/SCOPE

- A. Design: Refer to drawings.
 - 1. Member sizes shall comply with design rules specified in chart below.

Item	Fence Height	Outside Diameter Inches	F 1083 Sch 40 Weight lb/ft	F 1043-IC WT-40 Weight lb/ft
Line Post	thru 4 ft.	1.900	2.72	2.28
	over 4 to 8 ft.	2.375	3.65	3.12
Terminal Post	thru 4 ft.	2.375	3.65	3.12
	over 4 to 8 ft .	2.875	5.79	4.64
Rails		1.660	2.27	1.84

- B. Member Size:
 - 1. Intermediate Line Posts: As scheduled.
 - 2. Terminal, End, Corner or Pull Posts: As scheduled.
 - 3. Fabric height:
 - a. 4'-0"
 - 4. Provide top and bottom rail

2.3 FENCE FRAMEWORK

- A. Intermediate Line Posts:
 - 1. Round Steel Pipe and Rail: Schedule 40 standard weight pipe, complying with ASTM F 1083 and ASTM F 1043 Material Design Group IA, 1.8 oz/ ft² hot dipped galvanized zinc exterior and 1.8 oz/ft² hot dipped galvanized zinc interior coating.
 - a. Standard Grade: Minimum steel yield strength 30,000 psi.
 - b. High Strength Grade: Minimum yield strength 50,000 psi.

SECTION 02820

FENCES AND GATES

- 2. Round Steel Pipe and Rail: Cold-rolled electric-resistance pipe comply with ASTM F 1043 Materials Design Group IC, WT-40 pipe, minimum steel yield strength 50,000 psi, Type B external coating hot dipped galvanized zinc coating 0.90 oz/ ft² with a clear polymeric overcoat, Type D interior coating, 90 percent zinc-rich having a minimum thickness of 0.3-mils.
- B. Terminal, End, Corner or Pull Posts:
 - 1. Galvanized steel pipe conforming to ASTM F 1083 schedule 40 pipe.
 - 2. Galvanized steel pipe conforming to ASTM F 1043 Group IC, WT-40 pipe.
- C. Rails And Braces:
 - 1. 1.660 inches OD galvanized steel pipe conforming to ASTM F 1083, weighing 2.27 lb/ft.
 - 2. 1.660 inches OD galvanized steel pipe conforming to ASTM F 1043 Group IC, WT-40, weighing 1.84 lb/ft.
- D. Polymer Coated Framework.
 - 1. The polymer coating shall comply with ASTM F 1043.
 - 2. A minimum 10-mil Polyolefin coating shall be fused and adhered to the zinc exterior coating of the framework.
 - 3. Color shall be black in accordance with ASTM F 934.

2.4 FENCE FABRIC

- A. Schedule: Steel chain link mesh sizes and gauges produced in one-piece widths 3 feet (910 mm) to 12 feet (3660 mm). Mesh required shall comply with the following fabrication.

Mesh Size	6 gauge	9 gauge	11 gauge	11 1/2 gauge	12 gauge	Notes Applicable Specs
In.	0.192 in.	0.148 in.	0.120 in.	0.113 in.	0.105 in.	
2	X	X	X	N/A	N/A	ASTM A 392, A 491 F 668
1 3/4	X	X	X	N/A	N/A	ASTM A 392, A 491 F 668
1	N-M	X	X	N/A	N/A	ASTM A 392, A 491 F 668
5/8	N-M	N-M	X	X	X	All except A 392 Class 2, 2.0 oz/ ft ² (610 g/m ²)
1/2	N-M	N-M	X	X	X	All except A 392 Class 2, 2.0 oz/ ft ² (610 g/m ²)
3/8	N-M	N-M	X	X	X	All except A 392 Class 2, 2.0 oz/ ft ² (610 g/m ²)
Wire gauge	2,170	1,290	850	750	650	N-M = not manufactured N/A = not applicable for Industrial/commercial fencing
break load						

- B. Chain Link Fabric: Polymer-coated conforming to ASTM F 668 Class 1 extruded. Wire gage specified for polymer coated fabric shall be the steel core wire, not the finish coated diameter.
 - 1. Color shall be black in accordance with ASTM F 934.
 - 2. A minimum 10-mil Polyolefin coating shall be fused and adhered to the zinc exterior coating of the fence fabric.

2.5 TENSION WIRE

- A. Polymer coated steel tension wire per ASTM F 1664, shall a have 7 gauge (0.177 in.) core wire, color and coating same as the chain link fabric.

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2.6 FITTINGS

- A. Tension and brace bands shall be in accordance with ASTM F 626 fabricated of pressed steel having a minimum thickness of 12 gauge (0.105 inch), a minimum width of 3/4 inch and a minimum zinc coating of 1.20 oz/sf. Bands shall be supplied with 5/16 inch galvanized steel carriage bolts.
- B. Terminal post caps, line post loop tops, rail and brace ends, boulevard clamps and rail sleeves shall be pressed steel, galvanized after fabrication having a minimum zinc coating of 1.20 oz/sf steel in accordance with ASTM F 626.
- C. Truss rod assembly shall comply with ASTM F 626 consisting of a 3/8 inch diameter steel rod with a pressed steel tightener capable of withstanding a tension of 2,000 lb. The rod and the tightener shall have a minimum zinc coating of 1.2 oz/sf.
- D. Tension bars shall be per ASTM F 626 galvanized steel, one-piece length, 2 inches less than the fabric height having a minimum zinc coating of 1.2 oz./sf (366 g/sm). Bars for 2 inches and 1-3/4 inches mesh shall have a minimum cross section of 3/16 inch by 3/4 inch. Bars for 1 inch mesh shall have a cross section of 1/4 inch by 3/8 inch. Small mesh 3/8 inch, 1/2 inch and 5/8 inch shall be attached (sandwiched) to the terminal post using a galvanized steel strap having a minimum cross section of 2 inches (51 mm) by 3/16 inch provided with holes spaced 15 inches on center to accommodate 5/16 inch carriage bolts which will be inserted thru the strap the mesh and thru the terminal post.
- E. Polymer coated color fittings shall comply with ASTM F 626 having a polymer coating with a thickness of 0.006 inch which has been fused and adhered to the galvanized surface of the fittings. Color to match the fabric and framework.

2.7 TIE-WIRE AND HOG RINGS

- A. Tie Wire and Hog Rings: Galvanized minimum zinc coating 1.20 oz/sf, steel wire in compliance with ASTM F 626.
- B. Tie wires shall be fabricated from 11 gauge (0.120 in.) wire.
- C. Tie wires shall be fabricated from 9 gauge (0.148) wire.
- D. Hog rings shall be 9 gauge (0.148 in.).
- E. Polymer coated, match the coating, class and color to that of the chain link fabric.

2.8 SWING GATES

- A. Swing Gates shall be fabricated in accordance with ASTM F 900, welded construction.
 - 1. Gate frame members shall be 1.90 inches OD conforming to ASTM F 1083 schedule 40 galvanized steel pipe spaced a maximum of 8 ft apart vertically and horizontally.
 - 2. Gate frame members shall be 1.90 inch OD (48.3 mm) conforming to ASTM F 1043 Group IC WT 40 galvanized steel pipe spaced a maximum of 8 ft apart vertically and horizontally.
- B. Welded joints are to be protected by applying zinc-rich paint in accordance with ASTM Practice A 780. Gate latches shall be fabricated using 5/16 inch (7.9 mm) thick pressed steel, galvanized after fabrication. Galvanized post and frame hinges shall be manufactured of malleable iron or heavy gauge pressed steel. Gate fabric shall be as specified for the fence system.
- C. Gateposts shall be schedule 40 galvanized steel pipe per ASTM F 1083.
 - 1. Post size for gate openings:

Gate fabric height up to and including 6 ft.

Gate leaf width	Post Outside Diameter	Weight
up to 4 ft	2.375 in.	3.65 lb/ft
over 10 ft. to 18 ft.	4.000 in.	9.11 lb/ft

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Gate fabric height over 6 ft. to 12 ft.

Gate leaf width	Post Outside Diameter	Weight
up to 6 ft	2.875 in.	5.79 lb/ft
over 6 ft. to 12 ft.	4.000 in.	9.11 lb/ft
over 12 ft. to 18 ft.	6.625 in.	18.97 lb/ft
over 18 ft. to 24 ft.	8.625 in.	28.58 lb/ft

- D. Polymer coated gate frames and gateposts shall match the coating type and color specified for the fence framework. Moveable parts such as hinges, latches and drop rods may be field coated using a liquid polymer field touch up coating.

2.9 CONCRETE

- A. Concrete for post footings shall have a 28-day compressive strength of 2,500 psi.

PART 3 - EXECUTION

3.1 CLEARING FENCE LINE

- A. Surveying, clearing, grubbing, grading and removal of debris for the fence line or any required clear areas adjacent to the fence line is as indicated on the drawings.
1. This work is included in the earthwork contractor contract.
 2. This work is the responsibility of the fence contractor.

3.2 FRAMEWORK INSTALLATION

- A. Posts: Posts shall be set plumb in concrete footings complying with ASTM F 567. Minimum footing depth, 24 inches plus an additional 3 inches for each 1 ft. increase in the fence height over 4 ft. Minimum footing diameter four times the largest cross section of the post. Line posts installed at intervals not exceeding 10 ft. on center.
- B. Post footing to be 2 inches above grade crowned to shed water away from the post.
- C. Post footing to be 2 inches below grade crowned to shed water away from the post.
- D. Install minimum 21 ft lengths of top rail continuous thru the line post and splice using rail sleeves. The rail shall be secured to the terminal post by a brace band and rail end. Bottom rail or intermediate rail shall be field cut and secured to the line posts using boulevard bands.
- E. Terminal posts shall be braced and trussed for all fence 6 ft and higher and for fences 5 ft in height not having a top rail. The horizontal brace rail and diagonal truss rod shall be installed in accordance with ASTM F 567.

3.3 CHAIN LINK FABRIC INSTALLATION

- A. Chain link fabric shall be secured to the terminal post by threading a tension bar through the fabric then securing the tension bar to the post with tension bands spaced no greater than 12 inches on center. Small mesh fabric less than 1 inch, attach to the terminal post by sandwiching the mesh between the post and vertical 2 in. wide strap using carriage bolts threaded thru the strap, mesh and post no greater than 15 in. on center. The fabric shall be stretched taut free of sag. Fabric shall be secured to the line post with tie wires spaced no greater than 12 inches on center and to the top rail, brace rail and intermediated rail when specified, no greater than 18 inches on center. Excess wire shall be cut off and bent over to prevent injury. Tension wire shall be secured to the fabric using hog rings spaced 18 inches on center. The installed fabric shall have a ground clearance on no more than 2 inches.
1. Tie wire shall be wrapped around the post or rail and attached to the fabric wire picket on each side by twisting the tie wire around the fabric wire picket two full turns.

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2. Tie wire shall be wrapped 360 degrees around the post or rail and the two ends twisted together three full turns.

3.4 GATE INSTALLATION

- A. Horizontal cantilever slide gate installation varies by design and manufacturer. Refer to drawings.
 1. Gateposts shall be installed in accordance with ASTM F 567. Gates shall be plum in the closed position, installed to slide with an initial pull force no greater than 40 lb. Double gate drop bar receivers shall be installed in a concrete footing minimum 6 inches diameter 24 inches deep. Roller guards and guide posts shall be installed on Type I external roller cantilever slide gate per ASTM F 1184. Ground clearance shall be 3 inches, grade permitting.

3.5 NUTS AND BOLTS

- A. Carriage bolts used for fittings shall be installed with the head on the exposed side of the fence. Bolts shall be peened over to prevent removal of the nut.

3.6 ELECTRICAL GROUNDING

- A. Grounding of the fence and gates shall not be the responsibility of the fence contractor.
- B. Grounding shall be installed by a licensed electrical contractor.

3.7 CLEAN UP

- A. The area of the fence line shall be left neat and free of any debris as a result of the fence installation.

TYPE 2

2.2 MATERIAL

- A. Steel material for fence panels and posts shall conform to the requirements of ASTM A653/A653M, with a minimum yield strength of 45,000 psi (310 MPa) and a minimum zinc (hot-dip galvanized) coating weight of 0.90 oz/ft² (276 g/m²), Coating Designation G-90.
- B. Material for pickets shall be 1" square x 14 Ga. tubing. The rails shall be steel channel, 1.75" x 1.75" x .105". Picket holes in the rail shall be spaced 4.715" o.c. Fence posts and gate posts shall meet the minimum size requirements of Table 1.

2.3 FABRICATION

- A. Pickets, rails and posts shall be pre-cut to specified lengths. Rails shall be pre-punched to accept pickets.
- B. Pickets shall be inserted into the pre-punched holes in the rails and shall be aligned to standard spacing using a specially calibrated alignment fixture. The aligned pickets and rails shall be joined at each picket-to-rail intersection by welding process, thus completing the rigid panel assembly
- C. The manufactured panels and posts shall be subjected to an inline electrodeposition coating (E-Coat) process consisting of a multi-stage pretreatment/wash, followed by a duplex application of an epoxy primer and an acrylic topcoat. The minimum cumulative coating thickness of epoxy and acrylic shall be 2 mils (0.058 mm). The color shall be (Black). The coated panels and posts shall be capable of meeting the performance requirements for each quality characteristic shown in Table 2.
- D. The manufactured fence system shall be capable of meeting the vertical load, horizontal load, and infill performance requirements for Industrial weight fences under ASTM F2408.

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- E. Horizontal cantilever gates shall be fabricated using 1.75" x 14ga Forerunner double channel rail, 2" sq. x 12ga. gate ends, and 1" sq. x 14ga. pickets. Gates that exceed 6' in width will have a 1.75" sq. x 14ga. intermediate upright. All rail and upright intersections shall be joined by welding. All picket and rail intersections shall also be joined by welding. Gusset plates will be welded at each upright to rail intersection. Cable kits will be provided for additional trussing for all gates leaves over 6'. Refer to drawings for additional information. Gate system shall match fencing system and meet manufacturer's requirements.

PART 3 – EXECUTION

3.1 PREPARATION

- A. All new installation shall be laid out by the contractor in accordance with the construction plans.

3.2 FENCE INSTALLATION

- A. Fence post shall be spaced according to Table 3, plus or minus ½". For installations that must be raked to follow sloping grades, the post spacing dimension must be measured along the grade. Fence panels shall be attached to posts with brackets supplied by the manufacturer. Posts shall be set in concrete footers having a minimum depth of 36" (Note: In some cases, local restrictions of freezing weather conditions may require a greater depth). The "Earthwork" and "Concrete" sections of this specification shall govern material requirements for the concrete footer. Posts setting by other methods such as plated posts or grouted core-drilled footers are permissible only if shown by engineering analysis to be sufficient in strength for the intended application.

3.3 FENCE INSTALLATION MAINTENANCE

- A. When cutting/drilling rails or posts adhere to the following steps to seal the exposed steel surfaces; 1) Remove all metal shavings from cut area. 2) Apply zinc-rich primer to thoroughly cover cut edge and/or drilled hole; let dry. 3) Apply 2 coats of custom finish paint matching fence color. Failure to seal exposed surfaces per steps 1-3 above will negate warranty. Ameristar spray cans or paint pens shall be used to prime and finish exposed surfaces; it is recommended that paint pens be used to prevent overspray. Use of non-Ameristar parts or components will negate the manufactures' warranty.

3.4 GATE INSTALLATION

- A. Gate posts shall be spaced according to the manufacturers' gate drawings, dependent on standard out-to-out gate leaf dimensions and gate hardware selected. Type and quantity of gate hinges shall be based on the application; weight, height, and number of gate cycles. The manufacturers' gate drawings shall identify the necessary gate hardware required for the application. Gate hardware shall be provided by the manufacturer of the gate and shall be installed per manufacturer's recommendations.

3.5 CLEANING

- A. The contractor shall clean the jobsite of excess materials; post-hole excavations shall be scattered uniformly away from posts.

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Table 1 – Minimum Sizes for Montage II Posts			
<u>Fence Posts</u>		<u>Panel Height</u>	
2-1/2" x 12 Ga.		Up to & Including 6' Height	
<u>Gate Leaf</u>		<u>Gate Height</u>	
Up to 4'	2-1/2" x 12 Ga.	Up to & Including 4'	Over 4' Up to & Including 6'
		Over 6' Up to & Including 8'	Over 6' Up to & Including 8'

Table 2 – Coating Performance Requirements		
<u>Quality Characteristics</u>	<u>ASTM Test Method</u>	<u>Performance Requirements</u>
Adhesion	D3359 – Method B	Adhesion (Retention of Coating) over 90% of test area (Tape and knife test).
Corrosion Resistance	B117, D714 & D1654	Corrosion Resistance over 1,500 hours (Scribed per D1654; failure mode is accumulation of 1/8" coating loss from scribe or medium #8 blisters).
Impact Resistance	D2794	Impact Resistance over 60 inch lb. (Forward impact using 0.625" ball).
Weathering Resistance	D822 D2244, D523 (60° Method)	Weathering Resistance over 1,000 hours (Failure mode is 60% loss of gloss or color variance of more than 3 delta-E color units).

Table 3 – Montage II – Post Spacing By Bracket Type										
Span	For INVINCIBLE® 8' Nominal (91-1/2" Rail)				For CLASSIC, GENESIS, & MAJESTIC 8' Nominal (92-5/8" Rail)					
	2-1/2"	3"	2-1/2"	3"	2-1/2"	3"	2-1/2"	3"	2-1/2"	3"
Bracket Type	Industrial Flat Mount (BB301)*		Industrial Line 2-1/2" (BB319) 3" (BB320)		Industrial Universal 2.5" (BB302) 3" (BB303)		Industrial Flat Mount (BB301)		Industrial Swivel (BB304)*	
Post Settings ± 1/2" O.C.	94-1/2"	95"	94-1/2"	95"	96"	96-1/2"	96"	96-1/2"	*96"	*96-1/2"

*Note: When using BB304 swivel brackets on either or both ends of a panel installation, care must be taken to ensure the spacing between post and adjoining pickets meets applicable codes. This will require trimming one or both ends of the panel. When using the BB301 flat mount bracket for Invincible style, rail may need to be drilled to accommodate rail to bracket attachment.

END OF SECTION

SECTION 03051

CONCRETE MOISTURE VAPOR REDUCTION ADMIXTURE

PART 1 – GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Moisture Vapor Reducing Admixture (MVRA) for new concrete structural slabs on grade.
- B. Related Sections:
 - 1. Division 01: Administrative, procedural, and temporary work requirements.
 - 2. Section 033000 - Cast-in-place Concrete.

1.2 DEFINITIONS

- A. Cementitious Materials: Portland cement alone or in combination with one or more of following:
 - 1. Blended hydraulic cement.
 - 2. Fly ash and other pozzolans.
 - 3. Ground granulated blast-furnace slag.
 - 4. Silica fume.

1.3 REFERENCES

- A. American Concrete Institute (ACI) (www.concrete.org):
 - 1. 302.2R-06 - Guide for Concrete Slabs that Receive Moisture-Sensitive Flooring.
 - 2. 305R-10 - Guide to Hot Weather Concreting.
 - 3. 306R-10 - Guide to Cold Weather Concreting.
- B. ASTM International (ASTM) (www.astm.com):
 - 1. C494/C494M: Standard Specification for Chemical Admixtures for Concrete.
 - 2. D5084 - Standard Test Methods for Measurement of Hydraulic Conductivity of Saturated Porous Materials Using a Flexible Wall Permeameter.
 - 3. E1643 - Standard Practice for Selection, Design, Installation, and Inspection of Water Vapor Retarders Used in Contact with Earth or Granular Fill under Concrete Slabs.
 - 4. E1745 - Standard Specification for Plastic Water Vapor Retarders Used in Contact with Soil or Granular Fill under Concrete Slabs.
 - 5. F710 - Standard Practice for Preparing Concrete Floors to Receive Resilient Flooring.
- C. National Ready Mix Concrete Association (NRMCA) (www.nrmca.org) - Certification of Ready Mixed Concrete Production Facilities.

1.4 SUBMITTALS

- A. Submittals for Review:
 - 1. Product Data: Manufacturer's descriptive data for admixture.
 - 2. Warranties:
 - a. Sample lifetime warranty against flooring/coating failure due to concrete moisture vapor emission (MVE).
 - b. Sample adhesion warranty.
- B. Quality Control Submittals:
 - 1. Certificate of Compliance: Manufacturer's statement certifying admixture provided meets or exceeds specified requirements.
 - 2. Test Reports: Test results performed by qualified independent testing agency evidencing compliance of products with specified requirements of moisture vapor transmission based on ASTM D5084.

1.5 QUALITY ASSURANCE

- A. Manufacturer Qualifications:
 - 1. Firm experienced in manufacture of concrete MVRA.
 - 2. Capable of providing test reports indicating compliance with specified performance requirements and with ASTM C494/C494M testing protocols, from independent AASHTO approved laboratory.
 - 3. Able to provide on-site technical assistance if requested.

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- B. Pre-Installation Conference:
 - 1. Convene at Project site minimum 2 weeks prior to beginning work of this Section.
 - 2. Attendance: Architect, Contractor, Testing Laboratory, MVRA manufacturer, and concrete supplier, either in person or via teleconference.
 - 3. Review and discuss:
 - a. MVRA project specific quality control procedures.
 - b. Concrete mix designs.
 - c. Procedures for ensuring quality of concrete materials.
 - d. Testing laboratory responsible for concrete design mixtures, sampling and testing.
- C. Ready Mixed Concrete Manufacturer Qualifications:
 - 1. Firm experienced in manufacturing ready-mixed concrete products.
 - 2. Comply with ASTM C94/C94M requirements for production facilities and equipment.
 - 3. Manufacturer certified per NRMCA certification procedures.
- D. Slab Moisture Testing and Evaluation:
 - 1. Personnel performing laboratory tests: Certified in conduct of ASTM D5084 under supervision of licensed geotechnical engineer.
 - 2. Determination of whether concrete slab is prepared to receive flooring or coatings rests with MVRA manufacturer.
- E. Obtain concrete moisture vapor reducing admixtures from same manufacturer.
- F. Slabs to Receive Moisture Sensitive Coatings or Material: Comply with ACI 302.2R-06.

1.6 DELIVERY, STORAGE AND HANDLING

- A. Store products in temperature controlled area above 40 degrees, protected from exposure to harmful weather conditions
- B. Do not allow products to freeze.

1.7 WARRANTIES

- A. Provide manufacturer's lifetime warranty against concrete induced moisture vapor failure, providing coverage for:
 - 1. Repair or removal of failed flooring.
 - 2. Placement of topical moisture remediation system.
 - 3. Replacement of flooring materials to match original including material and labor.
- B. Provide manufacturer's adhesion warranty, matching terms of adhesive or primer manufacturer's material adhesion warranty.

PART 2 – PRODUCTS

2.1 MATERIALS

- A. Concrete Moisture Vapor Reduction Admixture (MVRA):
 - 1. Non-toxic, volatile organic compound (VOC) free, liquid admixture formulated to react with hydroxide ions produced by cement hydration process, creating additional hydration products within capillary pores, blocking moisture vapor movement through concrete.
 - 2. Physical characteristics:
 - a. Hydraulic conductivity: Project specific maximum of 6.0 E-8 cm/s per ASTM D5084.
 - b. Toxicity: None.
 - c. Odor: None.
 - d. Flammability: None.
 - e. Volatile Organic Compound (VOC) content: 0 grams per liter.
 - f. Freeze temperature: 32 degrees F (0 degrees C).
 - g. pH: 11.3.

SECTION 03051

CONCRETE MOISTURE VAPOR REDUCTION ADMIXTURE

2.2 ACCEPTABLE PRODUCTS AND MANUFACTURERS:

- A. Basis of design: MVRA 900 by ISE Logik Industries; Dean E. Craft, P: 585.474.3553, decraft@iselogik.com, www.iselogik.com
- B. Other acceptable products.
 - 1. Barrier One Moisture Vapor Reduction Admixture by Barrier One, Inc.; P: 877.224.5850, info@barrierone.com; <http://barrierone.com/>
 - 2. Concure Systems Admixture by Concure Systems; P: 480.820.7171; [http://www.concuresystems.com/admixture](http://www.concuresystems.com/admixture;);
- C. Submitted product must evidence compliance with:
 - 1. Lifetime warranty as described in paragraph 1.7
 - 2. Stand-alone adhesion warranty as described in paragraph 1.7
- D. Substitution Limitations: See Section 01 60 00 – PRODUCT REQUIREMENTS

2.3 ACCESSORIES

- A. Sheet Vapor Retarder: Specified in Section 033000.

2.4 MIXES

- A. Add MVRA to concrete mix in accordance with manufacturer's instructions.
- B. Add MVRA at a dosage rate per 100 pounds (355ml/45kg) of total cementitious materials as required by the MVRA manufacturer.
- C. Replace mix water on one-for-one basis in amount equal to amount of MVRA added.
- D. Add MRVA directly to freshly mixed concrete at end of the batch process with tail water.
- E. Ready-Mixed Concrete:
 - 1. Measure, batch, mix, and deliver concrete with MVRA in accordance with ASTM C94/C94M.
 - 2. Furnish batch ticket information showing dosage of MVRA.
- F. Site Mixing:
 - 1. Measure, batch, and mix concrete materials and concrete in accordance with ASTM C94/C94M.
 - 2. Add MVRA to where it makes direct contact with ready mix, then rotate drum of batch truck on high for at least seven minutes prior to discharge.
- G. Freshening onsite with held back mix water is acceptable if in accordance with ACI guidelines and if amount does not exceed original water to cementitious material ratio.
- H. Use water reducing admixtures to achieve desired slump.
- I. Use of other admixtures in same batch as MVRA is acceptable if each admixture is added separately.
- J. Do not use shrink reducing admixtures.

PART 3 – EXECUTION

3.1 INSTALLATION

- A. Comply with requirements of Section 033000 for concrete mixing, placing, and curing.
- B. Protect and repair sheet vapor retarder in accordance with to ASTM E1643, ASTM F710, ACI 302.2R-06, and manufacturer's instructions.
- C. Cold Weather Placement: Comply with ACI 306R-10.
- D. Hot Weather Placement: Comply with ACI 305R-10.

3.2 CURING

- A. Protect freshly placed concrete from premature drying and excessive cold or hot temperatures. Comply with ACI 306R-10 for cold-weather protection and ACI 305R-10 for hot-weather protection during curing.
- B. Cure concrete slabs to receive moisture sensitive coatings per ACI 302.2R-06 by one or more of the following methods:
 - 1. Moisture-retaining cover curing.
 - 2. Self-dissipating curing compound.

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3.3 FIELD QUALITY CONTROL

Test slab surface pH in accordance with ASTM F710 prior to any manufacturer's recommended bond testing.

- A. Project specific quality control process shall consist of the concrete moisture vapor reduction admixture representative procuring one random cylinder from every project containing the concrete moisture vapor reduction admixture. The cylinder shall be sent to an independent laboratory for hydraulic conductivity (coefficient of permeability) per ASTM D5084. The results of this "project specific" quality control protocol shall form the basis for the issuance of the project specific warranty.
 - 1. Should the Quality Control Protocol deliver results more than 6.0 E-08 cm/sec, the concrete moisture vapor reduction admixture manufacturer shall be permitted to core the project slab to test the in-place concrete per ASTM D5084.
 - 2. If the core delivers results less than 6.0 E-08 cm/sec, no further action is required
 - 3. If the core delivers results more than 6.0 E-08 cm/sec, the concrete moisture vapor admixture manufacturer shall provide, at their expense, a warranted topical moisture mitigation system or product for all areas not meeting the stated limit; including concrete slab preparation, material, and installation.
- B. Ready Mix Producer: Provide batch tickets indicating presence and dosage of MVRA in mix.

END OF SECTION

SECTION 03100

CONCRETE FORMS AND ACCESSORIES

PART 1 – GENERAL

1.1 SECTION INCLUDES

- A. Formwork for cast-in place concrete, with shoring, bracing and anchorage.
- B. Openings for other work.
- C. Form accessories.
- D. Form stripping.

1.2 RELATED DECTIONS

- A. Section 03200 - Concrete Reinforcement.
- B. Section 03300 - Cast-In-Place Concrete.
- C. Section 05310 - Steel Deck.
- D. Section 05500 - Metal Fabrications: Supply of metal fabrications for placement by this section.

1.3 REFERENCES

- A. Unless otherwise noted the most current issue of the reference shall be used.
- B. ACI 117 - Standard Specifications for Tolerances for Concrete Construction and Materials.
- C. ACI 301 - Specifications for Structural Concrete for Buildings; American Concrete Institute International.
- D. ACI 318 - Building Code Requirements for Reinforced Concrete and Commentary; American Concrete Institute International.
- E. ACI 347R - Guide to Formwork for Concrete; American Concrete Institute International.
- F. ASME A17.1 - Safety Code for Elevators and Escalators; The American Society of Mechanical Engineers.
- G. PS 1 - Construction and Industrial Plywood; National Institute of Standards and Technology (Department of Commerce).

1.4 DESIGN REQUIREMENTS

- A. Design, engineer and construct formwork, shoring and bracing to conform to design and code requirements; resultant concrete to conform to required shape, line and dimension.

1.5 SUBMITTALS

- A. See Section 01300 - Administrative Requirements for submittal procedures.
- B. Product Data: Provide data on void form materials and installation requirements.
- C. Shop Drawings: Indicate pertinent dimensions, materials, bracing, and arrangement of joints and ties.
- D. Provide data on form liner installation and provide min. 6" x 6" sample.

1.6 QUALITY ASSURANCE

- A. Perform work of this section in accordance with ACI 347R, ACI 301, and ACI 318. Maintain one copy of standards on project site.
- B. Design formwork under direct supervision of a Professional Structural Engineer experienced in design of concrete formwork and licensed in the State in which the Project is located.

1.7 REGULATORY REQUIREMENTS

- A. Conform to applicable code for design, fabrication, erection and removal of formwork.

1.8 DELIVERY, STORAGE, AND PROTECTION

- A. Section 01600 - Product Requirements: Transport, handle, store and protect products.
- B. Deliver void forms and installation instructions in manufacturer's packaging.
- C. Store void forms off ground in ventilated and protected manner to prevent deterioration from moisture.

SECTION 03100

CONCRETE FORMS AND ACCESSORIES

PART 2 – PRODUCTS

2.1 SECTION INCLUDES

- A. Standard Structural Concrete Formwork is at the Contractor's discretion, but must meet minimum requirements specified below.

2.2 WOOD FORM MATERIALS

- A. Typical Forms: Plyform, Class I, exterior minimum thickness 3/4" inch; in accordance with American Plywood Association Standards.
- B. Keyways: 2 inch lumber.

2.3 PREFABRICATED FORMS

- A. Manufacturers:
 - 1. American Polysteel Forms, Albuquerque, NM 87107
 - 2. Amico Stay-Form, Birmingham, IL 35208
 - 3. Molded Fiber Glass Concrete Forms Co., Union City, PA 16438.
 - 4. Sonoco Products Co., Hartsville, SC
 - 5. Symons Corp., Des Plaines, IL 60017
 - 6. Substitutions: See Section 01600 - Product requirements.
- B. Preformed Steel Forms: Minimum 16 gage matched, tight fitting, stiffened to support weight of concrete without deflection detrimental to tolerances and appearance of finished surfaces.
- C. Preformed Plastic Forms: Thermoplastic polystyrene form liner, tight fitting, stiffened to support weight of concrete without deflection detrimental to tolerances and appearance of finished surfaces.
- D. Glass Fiber Fabric Reinforced Plastic Forms: Matched, tight fitting, stiffened to support weight of concrete without deflection detrimental to tolerances and appearance of finished concrete surfaces.
- E. Pan Type: Steel, of size and profile indicated.
- F. Tubular Column Type: Round, spirally wound laminated fiber material, surface treated with release agent, non-reusable, of sizes indicated.
- G. Void Forms: Moisture resistant treated paper faces, biodegradable, structurally sufficient to support weight of wet concrete mix until initial set;

2.4 FORMWORK ACCESSORIES

- A. Form Ties: Removable or Snap-off type, galvanized metal, adjustable length, 1 inch back break dimension, free of defects that could leave holes larger than 1 inch in concrete surface; form ties designed to resist lateral pressure of fresh concrete on forms.
- B. Form Release Agent: Colorless mineral oil that will not stain concrete, absorb moisture, impair natural bonding of concrete finish coatings, or affect color characteristics of concrete finish coatings.
- C. Form Liners: Units of face designs, texture arrangement, and configuration indicated. Furnish with manufacturer's recommended liquid release agent that will not bond, stain or adversely affect concrete surfaces and will not impair subsequent surface treatments of concrete.
- D. Rustication Strips: Metal, rigid plastic, or dressed wood with sides beveled and back kerfed; nonstaining.
- E. Corners: Chamfered, wood strip or rigid plastic type; 3/4x 3/4 inch minimum size; maximum possible lengths.
- F. Dovetail Anchor Slot: Galvanized steel, 22 gauge thick, foam filled, release tape sealed slots, anchors for securing to concrete formwork.
- G. Flashing Reglets: Galvanized steel, 22 gauge thick, longest possible lengths, with alignment splines for joints, foam filled, release tape sealed slots, anchors for securing to concrete formwork.
- H. Nails, Spikes, Lag Bolts, Through Bolts, Anchorages: Sized as required, of sufficient strength and character to maintain formwork in place while placing concrete.

SECTION 03100

CONCRETE FORMS AND ACCESSORIES

- I. Waterstops: Polyvinyl chloride, minimum 1,750 psi tensile strength, minimum 50 degrees F to plus 175 degrees F working temperature range, 4 inch wide, maximum possible lengths, ribbed profile, preformed corner sections, heat welded jointing.

PART 3 – EXECUTION

3.1 EXAMINATION

- A. Verify lines, levels and centers before proceeding with formwork. Ensure that dimensions agree with drawings.

3.2 EARTH FORMS

- A. Earth forms are not permitted.

3.3 ERECTION – FORMWORK

- A. Erect formwork, shoring and bracing to achieve design requirements, in accordance with requirements of ACI 301, ACI 347 and ACI 318.
- B. Provide bracing to ensure stability of formwork. Shore or strengthen formwork subject to overstressing by construction loads.
- C. Arrange and assemble formwork to permit dismantling and stripping. Do not damage concrete during stripping. Permit removal of remaining principal shores.
- D. Align joints and make watertight. Keep form joints to a minimum.
- E. Obtain approval before framing openings in structural members that are not indicated on drawings.
- F. Provide chamfer strips on external corners of beams, joists, and columns.
- G. Install void forms in accordance with manufacturer's recommendations. Protect forms from moisture or crushing.
- H. Coordinate this section with other sections of work that require attachment of components to formwork.
- I. If formwork is placed after reinforcement, resulting in insufficient concrete cover over reinforcement, request instructions from Architect before proceeding.

3.4 APPLICATION – FORM RELEASE AGENT

- A. Apply form release agent on formwork in accordance with manufacturer's recommendations.
- B. Apply prior to placement of reinforcing steel, anchoring devices, and embedded items.
- C. Do not apply form release agent where concrete surfaces will receive special finishes or applied coverings that are affected by agent. Soak inside surfaces of untreated forms with clean water. Keep surfaces coated prior to placement of concrete.

3.5 INSERTS, EMBEDDED PARTS, AND OPENINGS

- A. Provide formed openings where required for items to be embedded in or passing through concrete work.
- B. Locate and set in place items that will be cast directly into concrete.
- C. Coordinate with work of other sections in forming and placing openings, slots, reglets, recesses, sleeves, bolts, anchors, other inserts, and components of other work.
- D. Position recessed anchor slots for brick veneer masonry anchors to spacing and intervals specified in Section 04816.
- E. Install accessories in accordance with manufacturer's instructions, so they are straight, level, and plumb. Ensure items are not disturbed during concrete placement.
- F. Install PVC waterstops in accordance with manufacturer's instructions, so they are continuous without displacing reinforcement. Heat seal joints so they are watertight.
- G. Provide temporary ports or openings in formwork where required to facilitate cleaning and inspection. Locate openings at bottom of forms to allow flushing water to drain.
- H. Close temporary openings with tight fitting panels, flush with inside face of forms, and neatly fitted so joints will not be apparent in exposed concrete surfaces.

SECTION 03100

CONCRETE FORMS AND ACCESSORIES

3.6 FORM CLEANING

- A. Clean forms as erection proceeds, to remove foreign matter within forms.
- B. Clean formed cavities of debris prior to placing concrete.
 - 1. Flush with water or use compressed air to remove remaining foreign matter. Ensure that water and debris drain to exterior through clean-out ports.
 - 2. During cold weather, remove ice and snow from within forms. Do not use de-icing salts. Do not use water to clean out forms, unless formwork and concrete construction proceed within heated enclosure. Use compressed air or other means to remove foreign matter.

3.7 FORMWORK TOLERANCES

- A. Construct formwork to maintain tolerances required by ACI 117-90 and ACI 301. Where conflicts occur, the more stringent requirement shall apply.
- B. Construct and align formwork for elevator hoistway in accordance with ASME A17.1.
- C. Camber slabs and beams in accordance with ACI 301.

3.8 FIELD QUALITY CONTROL

- A. An independent Testing Agency will perform field quality control tests, as specified in Section 01400.
- B. Inspect erected formwork, shoring, and bracing to ensure that work is in accordance with formwork design, and to verify that supports, fastenings, wedges, ties, and items are secure.
- C. Do not reuse wood formwork more than 4 times for concrete surfaces to be exposed to view. Do not patch formwork.
- D. When forms are reused, clean surfaces, remove laitance, and tighten to close joints. Align and secure joints to avoid offsets.

3.9 FORM REMOVAL

- A. Do not remove forms or bracing until concrete has gained sufficient strength to carry its own weight and imposed loads.
- B. Loosen forms carefully. Do not wedge pry bars, hammers, or tools against finish concrete surfaces scheduled for exposure to view.
- C. Store removed forms to prevent damage to form materials or to fresh concrete. Discard damaged forms.
- D. Wall Forms:
 - 1. If curing compound is not used, leave the forms in place for 7 days and keep continuously wet.
 - 2. If curing compound is used, remove forms 24 hours after concrete has been placed providing concrete has developed sufficient strength to sustain its own weight. Do not use curing compound on vertical concrete surfaces that will be painted or otherwise finished.
 - 3. During cold weather concreting, leave forms in place for 7 days in addition to placement of other cold weather protection.

END OF SECTION

SECTION 03200

CONCRETE REINFORCEMENT

PART 1 – GENERAL

1.1 SECTION INCLUDES

- A. Reinforcing steel for cast-in-place concrete.
- B. Supports and accessories for steel reinforcement.

1.2 RELATED SECTIONS

- A. Section 03100 - Concrete Forms and Accessories.
- B. Section 03300 - Cast-In-Place Concrete.
- C. Section 04810 - Unit Masonry Assemblies: Reinforcement for masonry.

1.3 REFERENCES

- A. Unless otherwise noted the most current issue of the reference shall be used.
- B. ACI 301 - Specifications for Structural Concrete for Buildings; American Concrete Institute International.
- C. ACI 318 - Building Code Requirements For Reinforced Concrete and Commentary; American Concrete Institute International.
- D. ACI SP-66 - ACI Detailing Manual; American Concrete Institute International.
- E. ASTM A 82 - Standard Specification for Steel Wire, Plain, for Concrete Reinforcement.
- F. ASTM A 184/A 184M - Standard Specification for Welded Deformed Steel Bar Mats for Concrete Reinforcement.
- G. ASTM A 185 - Standard Specification for Steel Welded Wire Reinforcement, Plain, for Concrete.
- H. ASTM A 497 - Standard Specification for Steel Welded Wire Reinforcement, Deformed, for Concrete.
- I. ASTM A 615/A 615M - Standard Specification for Deformed and Plain Billet-Steel Bars for Concrete Reinforcement.
- J. ASTM A 704/A 704M - Standard Specification for Welded Steel Plain Bar or Rod Mats for Concrete Reinforcement.
- K. ASTM A 767/A 767M - Standard Specification for Zinc-Coated (Galvanized) Steel Bars for Concrete Reinforcement.
- L. AWS D1.4 - Structural Welding Code - Reinforcing Steel; American Welding Society.
- M. CRSI (DA4) - Manual of Standard Practice; Concrete Reinforcing Steel Institute.
- N. CRSI (P1) - Placing Reinforcing Bars; Concrete Reinforcing Steel Institute.

1.4 SUBMITTALS

- A. See Section 01300 - Administrative Requirements for submittal procedures.
- B. Shop Drawings: Comply with requirements of ACI SP-66. Include bar schedules, shapes of bent bars, spacing of bars, and location of splices.
 - 1. Prepare shop drawings under seal of a Professional Structural Engineer experienced in design of work of this type and licensed in the State in which the Project is located.
- C. Manufacturer's Certificate: Certify that reinforcing steel and accessories supplied for this project meet or exceed specified requirements.
- D. Reports: Submit certified copies of mill test report of reinforcement materials analysis.

1.5 QUALITY ASSURANCE

- A. Perform work of this section in accordance with CRSI (DA4), CRSI (P1), ACI 301, and ACI 318.
 - 1. Maintain one copy of each document on project site.
- B. Welders' Certificates: Submit certifications for welders employed on the project, verifying AWS qualification within the previous 12 months.
- C. Prepare shop drawings under seal of a Professional Structural Engineer experienced in design of work of this type and licensed in the state where the project is located.

SECTION 03200

CONCRETE REINFORCEMENT

PART 2 – PRODUCTS

2.1 REINFORCEMENT

- A. Reinforcing Steel: ASTM A 615/A 615M Grade 60 (420).
 - 1. Deformed billet-steel bars.
 - 2. Galvanized in accordance with ASTM A 767/A 767M, Class I.
- B. Reinforcing Steel Mat: ASTM A 704/A 704M, using ASTM A 615/A 615M, Grade 60 (420) steel bars or rods, unfinished.
- C. Stirrup Steel: ASTM A 82 steel wire, unfinished.
- D. Welded Steel Wire Reinforcing (W.W.R.): ASTM A 185, plain type. Provide in sizes as shown on Drawings and in flat sheets. Roll stock is not permitted.
- E. Reinforcement Accessories:
 - 1. Tie Wire: Annealed, minimum 16 gage.
 - 2. Bar Supports: Bolsters for spacing, supporting, and fastening reinforcing bars in place. Manufacture bar supports according to CRSI's "Manual of Standard Practice" from steel wire precast concrete or fiber-reinforced concrete of greater compressive strength than concrete unless exceeded herein. Provide continuous length wire type bolsters with continuous sand plates for all slabs on grade. All support items in contact with vapor barrier system must have continuous plates so as to avoid puncture of the system during installation and over total life of structure.
 - 3. W.W.R. Supports: Chairs, for spacing, supporting, and fastening welded wire reinforcing in place. Provide continuous length wire type chairs with continuous sand plates for all welded wire reinforcing, placed in continuous rows maximum 4 feet on center or spaced sufficiently to support W.W.R. to intended position within concrete--plastic supports are not permitted for W.W.R. All support items in contact with vapor barrier system must have continuous plates so as to avoid puncture of the system during installation and over total life of structure.
 - 4. Bar and reinforcing Support Manufacturers:
 - a. Dayton Richmond Concrete Accessories, Miami, OH.
 - b. Meadow Burke Products, Chicago, IL.
 - c. Universal Form Clamp Co., Bellwood, IL.
 - d. Substitutions: See Section 01600 - Product Requirements.
 - 5. Provide stainless steel, galvanized, or plastic coated steel components for placement within 1-1/2 inches of weathering surfaces.
 - 6. Joint Dowel Bars: Plain-steel bars, ASTM A615/A615M, Grade 60 (420). Cut bars true to length with ends square and free of burrs.
- F. Reinforcing for concrete topping of precast concrete hollow core plank
 - 1. Woven wire fabric: 2 inch x 2 inch X 14 gauge, plain type, in flat sheets.

2.2 DELIVERY, STORAGE, AND PROTECTION

- A. Properly label all bars with weatherproof tags to facilitate identification.
- B. Store reinforcing steel on supports above ground level. Keep covered with tarpaulins.
- C. Protect coated bars from damage to coating.

2.3 FABRICATION

- A. Fabricate concrete reinforcing in accordance with CRSI (DA4) - Manual of Standard Practice.
- B. Welding of reinforcement is not permitted unless indicated on drawings. If and when explicitly indicated, perform welding in accordance with AWS D1.4.
- C. Locate reinforcing splices not indicated on drawings at point of minimum stress.
 - 1. Review locations of splices with Engineer.
 - 2. Minimize reinforcement splices.

SECTION 03200

CONCRETE REINFORCEMENT

PART 3 – EXECUTION

3.1 PLACEMENT

- A. Place, support and secure reinforcement against displacement in accordance with CRSI. Do not deviate from required position.
- B. Do not displace or damage vapor barrier for slabs on grade.
- C. Accommodate placement of formed openings.
- D. Lap welded wire fabric one full mesh at side and end laps and wire together.
- E. Tie bars at all points where bars cross or as required by CRSI (P1).
- F. Provide welded wire fabric in all interior concrete slabs on grade unless noted otherwise on plans.
- G. Provide keys and dowels where the walls and other items are shown to be built integrally but are placed as separate pours. Use dowels of the same size and spacing as reinforcing but not less than 48 bar diameters embedment.
- H. Splice reinforcing bars as required. Lap continuous reinforcing 48 diameters but not less than 18 inches.
- I. Minimum Wall Reinforcing: Two No. 5 bars, continuous top and bottom, unless other sizes or quantities are indicated. Reinforcing bars shall be continuous around corners or corner bars shall be provided of the same size and spacing of reinforcing bars.
- J. Prior to pouring concrete, check all reinforcing for contamination and clean as required.
- K. Conform to applicable code and requirements of contract documents for concrete cover over reinforcement.
- L. Tie bars at all points where crossed or as required by CRSI.
- M. Provide welded wire fabric in all interior concrete slabs on grade unless noted otherwise on plans.

3.2 FIELD QUALITY CONTROL

- A. An independent testing agency, as specified in Section 01400, will inspect installed reinforcement for conformance to contract documents before concrete placement.

END OF SECTION

SECTION 033000

CAST-IN-PLACE CONCRETE

PART 1 – GENERAL

1.1 SECTION INCLUDES

- A. Section includes cast-in-place concrete, including formwork, reinforcement, concrete materials, mixture design, placement procedures, and finishes, for the following:
 - 1. Footings.
 - 2. Foundation walls.
 - 3. Slabs-on-grade.
 - 4. Concrete toppings.

1.2 RELATED SECTIONS

- A. Division 32, Section “Concrete Paving” for concrete pavements and walks

1.3 REFERENCES

- A. ACI 301 - Specifications for Structural Concrete for Buildings; American Concrete Institute International
- B. ACI 318 - Building Code Requirements for Reinforced Concrete and Commentary; American Concrete Institute International

1.4 DEFINITIONS

- A. Cementitious Materials: Portland cement alone or in combination with one or more of the following: blended hydraulic cement, fly ash and other pozzolans, ground granulated blast-furnace slag, and silica fume; subject to compliance with requirements

1.5 SUBMITTALS

- A. Product Data: For each type of product indicated
- B. Design Mixtures: For each concrete mixture. Submit alternate design mixtures when characteristics of materials, Project conditions, weather, test results, or other circumstances warrant adjustments
 - 1. Indicate amounts of mixing water to be withheld for later addition at Project site.
- C. Steel Reinforcement Shop Drawings: Placing drawings that detail fabrication, bending, and placement. Include bar sizes, lengths, material, grade, bar schedules, stirrup spacing, bent bar diagrams, bar arrangement, splices and laps, mechanical connections, tie spacing, hoop spacing, and supports for concrete reinforcement
- D. Material Certificates: For each of the following, signed by manufacturers:
 - 1. Cementitious materials.
 - 2. Admixtures.
 - 3. Form materials and form-release agents.
 - 4. Steel reinforcement and accessories.
 - 5. Fiber reinforcement.
 - 6. Curing compounds.
 - 7. Vapor retarders.
- E. Floor surface flatness and levelness measurements indicating compliance with specified tolerances
- F. Field quality-control reports

1.6 QUALITY ASSURANCE

- A. Installer Qualifications: A qualified installer who employs on Project personnel qualified as ACI-certified Flatwork Technician and Finisher and a supervisor who is an ACI-certified Concrete Flatwork Technician
- B. Manufacturer Qualifications: A firm experienced in manufacturing ready-mixed concrete products and that complies with ASTM C 94/C 94M requirements for production facilities and equipment
- C. Testing Agency Qualifications: An independent agency qualified according to ASTM C 1077 and ASTM E 329 for testing indicated

SECTION 033000

CAST-IN-PLACE CONCRETE

1. Personnel conducting field tests shall be qualified as ACI Concrete Field Testing Technician, Grade 1, according to ACI CP-1 or an equivalent certification program.
2. Personnel performing laboratory tests shall be ACI-certified Concrete Strength Testing Technician and Concrete Laboratory Testing Technician - Grade I. Testing Agency laboratory supervisor shall be an ACI-certified Concrete Laboratory Testing Technician - Grade II.
- D. Source Limitations: Obtain each type or class of cementitious material of the same brand from the same manufacturer's plant, obtain aggregate from single source, and obtain admixtures from single source from single manufacturer
- E. ACI Publications: Comply with the following unless modified by requirements in the Contract Documents:
 1. ACI 301, "Specifications for Structural Concrete," Sections 1 through 5.
 2. ACI 117, "Specifications for Tolerances for Concrete Construction and Materials."
- F. Concrete Testing Service: Engage a qualified independent testing agency to perform material evaluation tests and to design concrete mixtures

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Steel Reinforcement: Deliver, store, and handle steel reinforcement to prevent bending and damage

PART 2 – PRODUCTS

2.1 FORM-FACING MATERIALS

- A. Smooth-Formed Finished Concrete: Form-facing panels that will provide continuous, true, and smooth concrete surfaces. Furnish in largest practicable sizes to minimize number of joints
 1. Plywood, metal, or other approved panel materials.
 2. Exterior-grade plywood panels, suitable for concrete forms, complying with DOC PS 1, and as follows:
 - a. Structural 1, B-B or better; mill oiled and edge sealed.
 - b. B-B (Concrete Form), Class 1 or better; mill oiled and edge sealed.
- B. Rough-Formed Finished Concrete: Plywood, lumber, metal, or another approved material. Provide lumber dressed on at least two edges and one side for tight fit
- C. Chamfer Strips: Wood, metal, PVC, or rubber strips, 3/4 by 3/4 inch (19 by 19 mm), minimum
- D. Rustication Strips: Wood, metal, PVC, or rubber strips, kerfed for ease of form removal
- E. Form-Release Agent: Commercially formulated form-release agent that will not bond with, stain, or adversely affect concrete surfaces and will not impair subsequent treatments of concrete surfaces
 1. Formulate form-release agent with rust inhibitor for steel form-facing materials.
- F. Form Ties: Factory-fabricated, removable or snap-off metal or glass-fiber-reinforced plastic form ties designed to resist lateral pressure of fresh concrete on forms and to prevent spalling of concrete on removal
 1. Furnish units that will leave no corrodible metal closer than 1 inch (25 mm) to the plane of exposed concrete surface.

2.2 STEEL REINFORCEMENT

- A. Reinforcing Bars: ASTM A 615/A 615M, Grade 60 (Grade 420), deformed
- B. Plain-Steel Welded Wire Reinforcement: ASTM A 185/A 185M, plain, fabricated from as-drawn steel wire into flat sheets

2.3 REINFORCEMENT ACCESSORIES

- A. Bar Supports: Bolsters, chairs, spacers, and other devices for spacing, supporting, and fastening reinforcing bars and welded wire reinforcement in place. Manufacture bar supports from steel wire, plastic, or precast concrete according to CRSI's "Manual of Standard Practice," of greater compressive strength than concrete and as follows

SECTION 033000

CAST-IN-PLACE CONCRETE

2.4 CONCRETE MATERIALS

- A. Cementitious Material: Use the following cementitious materials, of the same type, brand, and source, throughout Project
 - 1. Portland Cement: ASTM C 150, Type I, gray. May supplement with the following:
 - a. Fly Ash: ASTM C 618, Class F or C.
 - b. Ground Granulated Blast-Furnace Slag: ASTM C 989, Grade 100 or 120.
- B. Silica Fume: ASTM C 1240, amorphous silica
- C. Normal-Weight Aggregates: ASTM C 33, Class 3S coarse aggregate or better, graded. Provide aggregates from a single source
 - 1. Maximum Coarse-Aggregate Size: 1-1/2 inches (38 mm) for slabs on grade, 3/4 inch (19 mm)] nominal for other concrete.
 - 2. Fine Aggregate: Free of materials with deleterious reactivity to alkali in cement.
- D. Water: ASTM C 94/C 94M and potable.

2.5 ADMIXTURES

- A. Air-Entraining Admixture: ASTM C 260
- B. Chemical Admixtures: Provide admixtures certified by manufacturer to be compatible with other admixtures and that will not contribute water-soluble chloride ions exceeding those permitted in hardened concrete. Do not use calcium chloride or admixtures containing calcium chloride
 - 1. Water-Reducing Admixture: ASTM C 494/C 494M, Type A.
 - 2. Retarding Admixture: ASTM C 494/C 494M, Type B.
 - 3. Water-Reducing and Retarding Admixture: ASTM C 494/C 494M, Type D.
 - 4. High-Range, Water-Reducing Admixture: ASTM C 494/C 494M, Type F.
 - 5. High-Range, Water-Reducing and Retarding Admixture: ASTM C 494/C 494M, Type G.
 - 6. Plasticizing and Retarding Admixture: ASTM C 1017/C 1017M, Type II.

2.6 FIBER REINFORCEMENT

- A. Synthetic Macro-Fiber: Polyolefin macro-fibers engineered and designed for use in concrete, complying with ASTM C 1116/C 1116M, Type III, 1 to 2-1/4 inches (25 to 57 mm) long
 - 1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
 - a. 3M; Scotchcast Polyolefin Fibers 2".
 - b. Grace Construction Products, W. R. Grace & Co.; Strux 90/40.
 - c. Sika Corporation; Sika Fiber Force MS20.

2.7 VAPOR RETARDERS

- A. Sheet Vapor Retarder: ASTM E 1745, Class A. Include manufacturer's recommended adhesive or pressure-sensitive tape
 - 1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Fortifiber Building Systems Group; Moistop Ultra 15.
 - b. Grace Construction Products, W. R. Grace & Co.; Florprufe 120.
 - c. Meadows, W. R., Inc.; Perminator 15 mil.
 - d. Raven Industries Inc.; Vapor Block 15.
 - e. Reef Industries, Inc.; Griffolyn 15 mil Green.
 - f. Stego Industries, LLC; Stego Wrap 15 mil Class A.

2.8 CURING MATERIALS

- A. Evaporation Retarder: Waterborne, monomolecular film forming, manufactured for application to fresh concrete
 - 1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Conspec by Dayton Superior; Aquafilm.

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- b. Dayton Superior Corporation; Sure Film (J-74).
 - c. Euclid Chemical Company (The), an RPM company; Eucobar.
 - d. Lambert Corporation; LAMBCO Skin.
 - e. L&M Construction Chemicals, Inc.; E-CON.
 - f. Meadows, W. R., Inc.; EVAPRE.
 - g. Sika Corporation; SikaFilm.
- B. Absorptive Cover: AASHTO M 182, Class 2, burlap cloth made from jute or kenaf, weighing approximately 9 oz./sq. yd. (305 g/sq. m) when dry
- C. Moisture-Retaining Cover: ASTM C 171, polyethylene film or white burlap-polyethylene sheet
- D. Water: Potable
- E. Clear, Waterborne, Membrane-Forming Curing Compound: ASTM C 309, Type 1, Class B, dissipating
- 1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Conspec by Dayton Superior; W.B. Resin Cure.
 - b. Dayton Superior Corporation; Day-Chem Rez Cure (J-11-W).
 - c. Edoco by Dayton Superior; Res X Cure WB.
 - d. Euclid Chemical Company (The), an RPM company; Kurez W VOX; TAMMSCURE WB 30C.
 - e. Meadows, W. R., Inc.; 1100-CLEAR.
- F. Clear, Waterborne, Membrane-Forming Curing and Sealing Compound: ASTM C 1315, Type 1, Class A.
- 1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
 - a. BASF Construction Chemicals - Building Systems; Kure 1315.
 - b. ChemMasters; Polyseal WB.
 - c. Edoco by Dayton Superior; Cureseal 1315 WB.
 - d. Euclid Chemical Company (The), an RPM company; Super Diamond Clear VOX; LusterSeal WB 300.
 - e. L&M Construction Chemicals, Inc.; Lumiseal WB Plus.
 - f. Meadows, W. R., Inc.; Vocomp-30.

2.9 RELATED MATERIALS

- A. Expansion- and Isolation-Joint-Filler Strips: ASTM D 1751, asphalt-saturated cellulosic fiber
- B. Bonding Agent: ASTM C 1059/C 1059M, Type II, non-redispersible, acrylic emulsion or styrene butadiene

2.10 REPAIR MATERIALS

- A. Repair Underlayment: Cement-based, polymer-modified, self-leveling product that can be applied in thicknesses from 1/8 inch (3.2 mm) and that can be feathered at edges to match adjacent floor elevations
 - 1. Cement Binder: ASTM C 150, portland cement or hydraulic or blended hydraulic cement as defined in ASTM C 219.
 - 2. Primer: Product of underlayment manufacturer recommended for substrate, conditions, and application.
 - 3. Aggregate: Well-graded, washed gravel, 1/8 to 1/4 inch (3.2 to 6 mm) or coarse sand as recommended by underlayment manufacturer.
 - 4. Compressive Strength: Not less than 4100 psi (29 MPa) at 28 days when tested according to ASTM C 109/C 109M.
- B. Repair Overlayment: Cement-based, polymer-modified, self-leveling product that can be applied in thicknesses from 1/4 inch (6.4 mm) and that can be filled in over a scarified surface to match adjacent floor elevations
 - 1. Cement Binder: ASTM C 150, portland cement or hydraulic or blended hydraulic cement as defined in ASTM C 219.

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2. Primer: Product of topping manufacturer recommended for substrate, conditions, and application.
3. Aggregate: Well-graded, washed gravel, 1/8 to 1/4 inch (3.2 to 6 mm) or coarse sand as recommended by topping manufacturer.
4. Compressive Strength: Not less than 5000 psi (34.5 MPa) at 28 days when tested according to ASTM C 109/C 109M.

2.11 CONCRETE MIXTURES, GENERAL

- A. Prepare design mixtures for each type and strength of concrete, proportioned on the basis of laboratory trial mixture or field test data, or both, according to ACI 301
 1. Use a qualified independent testing agency for preparing and reporting proposed mixture designs based on laboratory trial mixtures.
- B. Cementitious Materials: Limit percentage, by weight, of cementitious materials other than portland cement in concrete as follows
 1. Fly Ash: 15 percent.
 2. Combined Fly Ash or Pozzolan and Ground Granulated Blast-Furnace Slag: 75 percent portland cement minimum, with fly ash or pozzolan not exceeding 15 percent.
- C. Limit water-soluble, chloride-ion content in hardened concrete to 0.15 percent by weight of cement
- D. Admixtures: Use admixtures according to manufacturer's written instructions
 1. Use water-reducing admixture in concrete, as required, for placement and workability.
 2. Use water-reducing and retarding admixture when required by high temperatures, low humidity, or other adverse placement conditions.
 3. Use water-reducing admixture in pumped concrete, concrete for heavy-use industrial slabs and parking structure slabs, concrete required to be watertight, and concrete with a water-cementitious materials ratio below 0.50.

2.12 CONCRETE MIXTURES FOR BUILDING ELEMENTS

- A. Footings and Foundation Walls: Proportion normal-weight concrete mixture as follows
 1. Minimum Compressive Strength: As noted in contract drawings.
 2. Maximum Water-Cementitious Materials Ratio: As noted in contract drawings.
 3. Slump Limit: As noted in contract drawings.
- B. Slabs-on-Grade: Proportion normal-weight concrete mixture as follows
 1. Minimum Compressive Strength: As noted in contract drawings.
 2. Minimum Cementitious Materials Content: As noted in contract drawings.
 3. Slump Limit: As noted in contract drawings.
 4. Air Content: As noted in contract drawings.

2.13 FABRICATING REINFORCEMENT

- A. Fabricate steel reinforcement according to CRSI's "Manual of Standard Practice"

2.14 CONCRETE MIXING

- A. Ready-Mixed Concrete: Measure, batch, mix, and deliver concrete according to ASTM C 94/C 94M, and furnish batch ticket information
 1. When air temperature is between 85 and 90 deg F (30 and 32 deg C), reduce mixing and delivery time from 1-1/2 hours to 75 minutes; when air temperature is above 90 deg F (32 deg C), reduce mixing and delivery time to 60 minutes.

PART 3 – EXECUTION

3.1 FORMWORK

- A. Design, erect, shore, brace, and maintain formwork, according to ACI 301, to support vertical, lateral, static, and dynamic loads, and construction loads that might be applied, until structure can support such loads

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- B. Construct formwork so concrete members and structures are of size, shape, alignment, elevation, and position indicated, within tolerance limits of ACI 117
- C. Limit concrete surface irregularities, designated by ACI 347 as abrupt or gradual, as follows
 - 1. Class A, 1/8 inch (3.2 mm) for smooth-formed finished surfaces.
 - 2. Class C, 1/2 inch (13 mm) for rough-formed finished surfaces.
- D. Construct forms tight enough to prevent loss of concrete mortar
- E. Fabricate forms for easy removal without hammering or prying against concrete surfaces. Provide crush or wrecking plates where stripping may damage cast concrete surfaces. Provide top forms for inclined surfaces steeper than 1.5 horizontal to 1 vertical
 - 1. Install keyways, reglets, recesses, and the like, for easy removal.
 - 2. Do not use rust-stained steel form-facing material.
- F. Set edge forms, bulkheads, and intermediate screed strips for slabs to achieve required elevations and slopes in finished concrete surfaces. Provide and secure units to support screed strips; use strike-off templates or compacting-type screeds
- G. Provide temporary openings for cleanouts and inspection ports where interior area of formwork is inaccessible. Close openings with panels tightly fitted to forms and securely braced to prevent loss of concrete mortar. Locate temporary openings in forms at inconspicuous locations
- H. Chamfer exterior corners and edges of permanently exposed concrete
- I. Form openings, chases, offsets, sinkages, keyways, reglets, blocking, screeds, and bulkheads required in the Work. Determine sizes and locations from trades providing such items
- J. Clean forms and adjacent surfaces to receive concrete. Remove chips, wood, sawdust, dirt, and other debris just before placing concrete
- K. Retighten forms and bracing before placing concrete, as required, to prevent mortar leaks and maintain proper alignment
- L. Coat contact surfaces of forms with form-release agent, according to manufacturer's written instructions, before placing reinforcement

3.2 EMBEDDED ITEMS

- A. Place and secure anchorage devices and other embedded items required for adjoining work that is attached to or supported by cast-in-place concrete. Use setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded
 - 1. Install anchor rods, accurately located, to elevations required and complying with tolerances in Section 7.5 of AISC's "Code of Standard Practice for Steel Buildings and Bridges."

3.3 REMOVING AND REUSING FORMS

- A. General: Formwork for sides of beams, walls, columns, and similar parts of the Work that does not support weight of concrete may be removed after cumulatively curing at not less than 50 deg F (10 deg C) for 24 hours after placing concrete. Concrete has to be hard enough to not be damaged by form-removal operations and curing and protection operations need to be maintained
- B. Clean and repair surfaces of forms to be reused in the Work. Split, frayed, delaminated, or otherwise damaged form-facing material will not be acceptable for exposed surfaces. Apply new form-release agent
- C. When forms are reused, clean surfaces, remove fins and laitance, and tighten to close joints. Align and secure joints to avoid offsets. Do not use patched forms for exposed concrete surfaces unless approved by Architect

3.4 VAPOR RETARDERS

- A. Sheet Vapor Retarders: Place, protect, and repair sheet vapor retarder according to ASTM E 1643 and manufacturer's written instructions
 - 1. Lap joints 6 inches (150 mm) and seal with manufacturers recommended tape.

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CAST-IN-PLACE CONCRETE

3.5 STEEL REINFORCEMENT

- A. General: Comply with CRSI's "Manual of Standard Practice" for placing reinforcement
 1. Do not cut or puncture vapor retarder. Repair damage and reseal vapor retarder before placing concrete.
- B. Clean reinforcement of loose rust and mill scale, earth, ice, and other foreign materials that would reduce bond to concrete
- C. Accurately position, support, and secure reinforcement against displacement. Locate and support reinforcement with bar supports to maintain minimum concrete cover. Do not tack weld crossing reinforcing bars
- D. Set wire ties with ends directed into concrete, not toward exposed concrete surfaces
- E. Install welded wire reinforcement in longest practicable lengths on bar supports spaced to minimize sagging. Lap edges and ends of adjoining sheets at least one mesh spacing. Offset laps of adjoining sheet widths to prevent continuous laps in either direction. Lace overlaps with wire

3.6 JOINTS

- A. General: Construct joints true to line with faces perpendicular to surface plane of concrete
- B. Construction Joints: Install so strength and appearance of concrete are not impaired, at locations indicated or as approved by Architect
 1. Place joints perpendicular to main reinforcement. Continue reinforcement across construction joints unless otherwise indicated. Do not continue reinforcement through sides of strip placements of floors and slabs.
 2. Form keyed joints as indicated. Embed keys at least 1-1/2 inches (38 mm) into concrete.
 3. Space vertical joints in walls as indicated. Locate joints beside piers integral with walls, near corners, and in concealed locations where possible.
 4. Use a bonding agent at locations where fresh concrete is placed against hardened or partially hardened concrete surfaces.
- C. Contraction Joints in Slabs-on-Grade: Form weakened-plane contraction joints, sectioning concrete into areas as indicated. Construct contraction joints for a depth equal to at least one-fourth of concrete thickness as follows
 1. Grooved Joints: Form contraction joints after initial floating by grooving and finishing each edge of joint to a radius of 1/8 inch (3.2 mm). Repeat grooving of contraction joints after applying surface finishes. Eliminate groover tool marks on concrete surfaces.
 2. Sawed Joints: Form contraction joints with power saws equipped with shatterproof abrasive or diamond-rimmed blades. Cut 1/8-inch- (3.2-mm-) wide joints into concrete when cutting action will not tear, abrade, or otherwise damage surface and before concrete develops random contraction cracks.
- D. Isolation Joints in Slabs-on-Grade: After removing formwork, install joint-filler strips at slab junctions with vertical surfaces, such as column pedestals, foundation walls, grade beams, and other locations, as indicated
 1. Extend joint-filler strips full width and depth of joint, terminating flush with finished concrete surface unless otherwise indicated.
 2. Terminate full-width joint-filler strips not less than 1/2 inch (13 mm) or more than 1 inch (25 mm) below finished concrete surface where joint sealants, specified in Division 07 Section "Joint Sealants," are indicated.
 3. Install joint-filler strips in lengths as long as practicable. Where more than one length is required, lace or clip sections together.
- E. Doweled Joints: Install dowel bars and support assemblies at joints where indicated. Lubricate or asphalt coat one-half of dowel length to prevent concrete bonding to one side of joint

3.7 CONCRETE PLACEMENT

- A. Before placing concrete, verify that installation of formwork, reinforcement, and embedded items is complete and that required inspections have been performed
- B. Do not add water to concrete during delivery, at Project site, or during placement unless approved by Architect

SECTION 033000

CAST-IN-PLACE CONCRETE

- C. Before test sampling and placing concrete, water may be added at Project site, subject to limitations of ACI 301
 - 1. Do not add water to concrete after adding high-range water-reducing admixtures to mixture.
- D. Deposit concrete continuously in one layer or in horizontal layers of such thickness that no new concrete will be placed on concrete that has hardened enough to cause seams or planes of weakness. If a section cannot be placed continuously, provide construction joints as indicated. Deposit concrete to avoid segregation
 - 1. Deposit concrete in horizontal layers of depth to not exceed formwork design pressures and in a manner to avoid inclined construction joints.
 - 2. Consolidate placed concrete with mechanical vibrating equipment according to ACI 301.
 - 3. Do not use vibrators to transport concrete inside forms. Insert and withdraw vibrators vertically at uniformly spaced locations to rapidly penetrate placed layer and at least 6 inches (150 mm) into preceding layer. Do not insert vibrators into lower layers of concrete that have begun to lose plasticity. At each insertion, limit duration of vibration to time necessary to consolidate concrete and complete embedment of reinforcement and other embedded items without causing mixture constituents to segregate.
- E. Deposit and consolidate concrete for floors and slabs in a continuous operation, within limits of construction joints, until placement of a panel or section is complete
 - 1. Consolidate concrete during placement operations so concrete is thoroughly worked around reinforcement and other embedded items and into corners.
 - 2. Maintain reinforcement in position on chairs during concrete placement.
 - 3. Screed slab surfaces with a straightedge and strike off to correct elevations.
 - 4. Slope surfaces uniformly to drains where required.
 - 5. Begin initial floating using bull floats or darbies to form a uniform and open-textured surface plane, before excess bleedwater appears on the surface. Do not further disturb slab surfaces before starting finishing operations.
- F. Cold-Weather Placement: Comply with ACI 306.1 and as follows. Protect concrete work from physical damage or reduced strength that could be caused by frost, freezing actions, or low temperatures
 - 1. When average high and low temperature is expected to fall below 40 deg F (4.4 deg C) for three successive days, maintain delivered concrete mixture temperature within the temperature range required by ACI 301.
 - 2. Do not use frozen materials or materials containing ice or snow. Do not place concrete on frozen subgrade or on subgrade containing frozen materials.
 - 3. Do not use calcium chloride, salt, or other materials containing antifreeze agents or chemical accelerators unless otherwise specified and approved in mixture designs.
- G. Hot-Weather Placement: Comply with ACI 301 and as follows
 - 1. Maintain concrete temperature below 90 deg F (32 deg C) at time of placement. Chilled mixing water or chopped ice may be used to control temperature, provided water equivalent of ice is calculated to total amount of mixing water. Using liquid nitrogen to cool concrete is Contractor's option.
 - 2. Fog-spray forms, steel reinforcement, and subgrade just before placing concrete. Keep subgrade uniformly moist without standing water, soft spots, or dry areas.

3.8 FINISHING FORMED SURFACES

- A. Rough-Formed Finish: As-cast concrete texture imparted by form-facing material with tie holes and defects repaired and patched. Remove fins and other projections that exceed specified limits on formed-surface irregularities
 - 1. Apply to concrete surfaces not exposed to public view.
- B. Smooth-Formed Finish: As-cast concrete texture imparted by form-facing material, arranged in an orderly and symmetrical manner with a minimum of seams. Repair and patch tie holes and defects. Remove fins and other projections that exceed specified limits on formed-surface irregularities
 - 1. Apply to concrete surfaces exposed to public view.

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CAST-IN-PLACE CONCRETE

- C. Related Unformed Surfaces: At tops of walls, horizontal offsets, and similar unformed surfaces adjacent to formed surfaces, strike off smooth and finish with a texture matching adjacent formed surfaces. Continue final surface treatment of formed surfaces uniformly across adjacent unformed surfaces unless otherwise indicated

3.9 FINISHING FLOORS AND SLABS

- A. General: Comply with ACI 302.1R recommendations for screeding, restraighening, and finishing operations for concrete surfaces. Do not wet concrete surfaces
- B. Float Finish: Consolidate surface with power-driven floats or by hand floating if area is small or inaccessible to power driven floats. Restraighten, cut down high spots, and fill low spots. Repeat float passes and restraighening until surface is left with a uniform, smooth, granular texture
 - 1. Apply float finish to surfaces to receive trowel finish.
- C. Trowel Finish: After applying float finish, apply first troweling and consolidate concrete by hand or power-driven trowel. Continue troweling passes and restraighten until surface is free of trowel marks and uniform in texture and appearance. Grind smooth any surface defects that would telegraph through applied coatings or floor coverings
 - 1. Apply a trowel finish to surfaces exposed to view or to be covered with resilient flooring, carpet, ceramic or quarry tile set over a cleavage membrane, paint, or another thin-film-finish coating system.
 - 2. Finish surfaces to the following tolerances, according to ASTM E 1155 (ASTM E 1155M), for a randomly trafficked floor surface:
 - a. Specified overall values of flatness, F(F) 25; and of levelness, F(L) 20; with minimum local values of flatness, F(F) 17; and of levelness, F(L) 15.
- D. Trowel and Fine-Broom Finish: Apply a first trowel finish to surfaces where ceramic or quarry tile is to be installed by either thickset or thin-set method. While concrete is still plastic, slightly scarify surface with a fine broom
 - 1. Comply with flatness and levelness tolerances for trowel-finished floor surfaces.
- E. Broom Finish: Apply a broom finish to exterior concrete platforms, steps, ramps, and elsewhere as indicated
 - 1. Immediately after float finishing, slightly roughen trafficked surface by brooming with fiber-bristle broom perpendicular to main traffic route. Coordinate required final finish with Architect before application.

3.10 MISCELLANEOUS CONCRETE ITEMS

- A. Filling In: Fill in holes and openings left in concrete structures after work of other trades is in place unless otherwise indicated. Mix, place, and cure concrete, as specified, to blend with in-place construction. Provide other miscellaneous concrete filling indicated or required to complete the Work
- B. Equipment Bases and Foundations: Provide machine and equipment bases and foundations as shown on Drawings. Set anchor bolts for machines and equipment at correct elevations, complying with diagrams or templates from manufacturer furnishing machines and equipment

3.11 CONCRETE PROTECTING AND CURING

- A. General: Protect freshly placed concrete from premature drying and excessive cold or hot temperatures. Comply with ACI 306.1 for cold-weather protection and ACI 301 for hot-weather protection during curing
- B. Evaporation Retarder: Apply evaporation retarder to unformed concrete surfaces if hot, dry, or windy conditions cause moisture loss approaching 0.2 lb/sq. ft. x h (1 kg/sq. m x h) before and during finishing operations. Apply according to manufacturer's written instructions after placing, screeding, and bull floating or darbying concrete, but before float finishing
- C. Formed Surfaces: Cure formed concrete surfaces, including underside of beams, supported slabs, and other similar surfaces. If forms remain during curing period, moist cure after loosening forms. If removing forms before end of curing period, continue curing for the remainder of the curing period

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- D. Unformed Surfaces: Begin curing immediately after finishing concrete. Cure unformed surfaces, including floors and slabs, concrete floor toppings, and other surfaces
- E. Cure concrete according to ACI 308.1, by one or a combination of the following methods
 - 1. Moisture-Retaining-Cover Curing: Cover concrete surfaces with moisture-retaining cover for curing concrete, placed in widest practicable width, with sides and ends lapped at least 12 inches (300 mm), and sealed by waterproof tape or adhesive. Cure for not less than seven days. Immediately repair any holes or tears during curing period using cover material and waterproof tape.
 - a. Cure concrete surfaces to receive floor coverings with either a moisture-retaining cover or a curing compound that the manufacturer certifies will not interfere with bonding of floor covering used on Project.
 - 2. Curing Compound: Apply uniformly in continuous operation by power spray or roller according to manufacturer's written instructions. Recoat areas subjected to heavy rainfall within three hours after initial application. Maintain continuity of coating and repair damage during curing period.
 - a. Removal: After curing period has elapsed, remove curing compound without damaging concrete surfaces by method recommended by curing compound manufacturer unless manufacturer certifies curing compound will not interfere with bonding of floor covering used on Project.
 - 3. Curing and Sealing Compound: Apply uniformly to floors and slabs indicated in a continuous operation by power spray or roller according to manufacturer's written instructions. Recoat areas subjected to heavy rainfall within three hours after initial application. Repeat process 24 hours later and apply a second coat. Maintain continuity of coating and repair damage during curing period.
- F. Sealing Coat: Uniformly apply a continuous sealing coat of curing and sealing compound to hardened concrete by power spray or roller according to manufacturer's written instructions

3.12 CONCRETE SURFACE REPAIRS

- A. Defective Concrete: Repair and patch defective areas when approved by Architect. Remove and replace concrete that cannot be repaired and patched to Architect's approval
- B. Patching Mortar: Mix dry-pack patching mortar, consisting of one part portland cement to two and one-half parts fine aggregate passing a No. 16 (1.18-mm) sieve, using only enough water for handling and placing
- C. Repairing Formed Surfaces: Surface defects include color and texture irregularities, cracks, spalls, air bubbles, honeycombs, rock pockets, fins and other projections on the surface, and stains and other discolorations that cannot be removed by cleaning
 - 1. Immediately after form removal, cut out honeycombs, rock pockets, and voids more than 1/2 inch (13 mm) in any dimension to solid concrete. Limit cut depth to 3/4 inch (19 mm). Make edges of cuts perpendicular to concrete surface. Clean, dampen with water, and brush-coat holes and voids with bonding agent. Fill and compact with patching mortar before bonding agent has dried. Fill form-tie voids with patching mortar or cone plugs secured in place with bonding agent.
 - 2. Repair defects on surfaces exposed to view by blending white portland cement and standard portland cement so that, when dry, patching mortar will match surrounding color. Patch a test area at inconspicuous locations to verify mixture and color match before proceeding with patching. Compact mortar in place and strike off slightly higher than surrounding surface.
 - 3. Repair defects on concealed formed surfaces that affect concrete's durability and structural performance as determined by Architect.
- D. Repairing Unformed Surfaces: Test unformed surfaces, such as floors and slabs, for finish and verify surface tolerances specified for each surface. Correct low and high areas. Test surfaces sloped to drain for trueness of slope and smoothness; use a sloped template

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CAST-IN-PLACE CONCRETE

1. Repair finished surfaces containing defects. Surface defects include spalls, popouts, honeycombs, rock pockets, crazing and cracks in excess of 0.01 inch (0.25 mm) wide or that penetrate to reinforcement or completely through unreinforced sections regardless of width, and other objectionable conditions.
 2. After concrete has cured at least 14 days, correct high areas by grinding.
 3. Correct localized low areas during or immediately after completing surface finishing operations by cutting out low areas and replacing with patching mortar. Finish repaired areas to blend into adjacent concrete.
 4. Correct other low areas scheduled to receive floor coverings with a repair underlayment. Prepare, mix, and apply repair underlayment and primer according to manufacturer's written instructions to produce a smooth, uniform, plane, and level surface. Feather edges to match adjacent floor elevations.
 5. Correct other low areas scheduled to remain exposed with a repair topping. Cut out low areas to ensure a minimum repair topping depth of 1/4 inch (6 mm) to match adjacent floor elevations. Prepare, mix, and apply repair topping and primer according to manufacturer's written instructions to produce a smooth, uniform, plane, and level surface.
 6. Repair defective areas, except random cracks and single holes 1 inch (25 mm) or less in diameter, by cutting out and replacing with fresh concrete. Remove defective areas with clean, square cuts and expose steel reinforcement with at least a 3/4-inch (19-mm) clearance all around. Dampen concrete surfaces in contact with patching concrete and apply bonding agent. Mix patching concrete of same materials and mixture as original concrete except without coarse aggregate. Place, compact, and finish to blend with adjacent finished concrete. Cure in same manner as adjacent concrete.
 7. Repair random cracks and single holes 1 inch (25 mm) or less in diameter with patching mortar. Groove top of cracks and cut out holes to sound concrete and clean off dust, dirt, and loose particles. Dampen cleaned concrete surfaces and apply bonding agent. Place patching mortar before bonding agent has dried. Compact patching mortar and finish to match adjacent concrete. Keep patched area continuously moist for at least 72 hours.
- E. Perform structural repairs of concrete, subject to Architect's approval, using epoxy adhesive and patching mortar
- F. Repair materials and installation not specified above may be used, subject to Architect's approval

3.13 FIELD QUALITY CONTROL

- A. Testing and Inspecting: Owner will engage a qualified testing and inspecting agency to perform field tests and inspections and prepare test reports
- B. Testing and Inspecting: Engage a qualified testing and inspecting agency to perform tests and inspections and to submit reports
- C. Inspections
 1. Steel reinforcement placement.
 2. Verification of use of required design mixture.
 3. Concrete placement, including conveying and depositing.
 4. Curing procedures and maintenance of curing temperature.
- D. Concrete Tests: Testing of composite samples of fresh concrete obtained according to ASTM C 172 shall be performed according to the following requirements
 1. Testing Frequency: Obtain one composite sample for each day's pour of each concrete mixture exceeding 5 cu. yd. (4 cu. m), but less than 25 cu. yd. (19 cu. m), plus one set for each additional 50 cu. yd. (38 cu. m) or fraction thereof.
 - a. When frequency of testing will provide fewer than five compressive-strength tests for each concrete mixture, testing shall be conducted from at least five randomly selected batches or from each batch if fewer than five are used.
 2. Slump: ASTM C 143/C 143M; one test at point of placement for each composite sample, but not less than one test for each day's pour of each concrete mixture. Perform additional tests when concrete consistency appears to change.

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3. Concrete Temperature: ASTM C 1064/C 1064M; one test hourly when air temperature is 40 deg F (4.4 deg C) and below and when 80 deg F (27 deg C) and above, and one test for each composite sample.
 4. Compression Test Specimens: ASTM C 31/C 31M.
 - a. Cast and laboratory cure two sets of two standard cylinder specimens for each composite sample.
 - b. Cast and field cure two sets of two standard cylinder specimens for each composite sample.
 5. Compressive-Strength Tests: ASTM C 39/C 39M; test one set of two laboratory-cured specimens at 7 days and one set of two specimens at 28 days.
 - a. Test one set of two field-cured specimens at 7 days and one set of two specimens at 28 days.
 - b. A compressive-strength test shall be the average compressive strength from a set of two specimens obtained from same composite sample and tested at age indicated.
 6. When strength of field-cured cylinders is less than 85 percent of companion laboratory-cured cylinders, Contractor shall evaluate operations and provide corrective procedures for protecting and curing in-place concrete.
 7. Strength of each concrete mixture will be satisfactory if every average of any three consecutive compressive-strength tests equals or exceeds specified compressive strength and no compressive-strength test value falls below specified compressive strength by more than 500 psi (3.4 MPa).
 8. Test results shall be reported in writing to Architect, Structural Engineer, concrete manufacturer, and Contractor within 48 hours of testing. Reports of compressive-strength tests shall contain Project identification name and number, date of concrete placement, name of concrete testing and inspecting agency, location of concrete batch in Work, design compressive strength at 28 days, concrete mixture proportions and materials, compressive breaking strength, and type of break for both 7- and 28-day tests.
 9. Nondestructive Testing: Impact hammer, sonoscope, or other nondestructive device may be permitted by Architect but will not be used as sole basis for approval or rejection of concrete.
 10. Additional Tests: Testing and inspecting agency shall make additional tests of concrete when test results indicate that slump, air entrainment, compressive strengths, or other requirements have not been met, as directed by Architect. Testing and inspecting agency may conduct tests to determine adequacy of concrete by cored cylinders complying with ASTM C 42/C 42M or by other methods as directed by Architect.
 11. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.
 12. Correct deficiencies in the Work that test reports and inspections indicate do not comply with the Contract Documents.
- E. Measure floor and slab flatness and levelness according to ASTM E 1155 (ASTM E 1155M) within 48 hours of finishing

END OF SECTION

SECTION 03356

CONCRETE FLOOR FINISHING

PART 1 – GENERAL

1.1 SECTION INCLUDES

- A. Finishing slabs on grade and monolithic floor slabs.
- B. Surface treatment with concrete hardener, sealer, and slip resistant coatings.

1.2 RELATED SECTIONS

- A. Section 03300 - Cast-In-Place Concrete: Prepared concrete floors ready to receive finish.

1.3 REFERENCES

- A. Unless otherwise noted the most current issue of the reference shall be used.
- B. ACI 301 - Specifications for Structural Concrete for Buildings; American Concrete Institute International.
- C. ACI 302.1R - Guide for Concrete Floor and Slab Construction; American Concrete Institute International.

1.4 SUBMITTALS

- A. See Section 01300 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide data on concrete hardener, sealer, and slip resistant treatment, including information on compatibility of different products and limitations.
- C. Maintenance Data: Provide data on maintenance renewal of applied coatings.

1.5 QUALITY ASSURANCE

- A. Perform Work in accordance with ACI 301.

1.6 DELIVERY, STORAGE, AND HAULING

- A. Deliver materials in manufacturer's sealed packaging, including application instructions.

1.7 PROJECT CONDITIONS

- A. Coordinate the work with concrete floor placement and concrete floor curing.

1.8 ENVIRONMENTAL REQUIREMENTS

- A. Temporary Lighting: Minimum 200 W light source, placed 8 feet above the floor surface, for each 425 sq ft of floor being finished.
- B. Do not finish floors until interior heating system is operational.
- C. Temporary Heat: Ambient temperature of 50 degrees F minimum at concrete surface.
- D. Ventilation: Sufficient to prevent injurious gases from temporary heat or other sources affecting concrete.

PART 2 – PRODUCTS

2.1 MANUFACTURERS

- A. Acceptable Manufacturer: Curecrete Distribution, Inc; 1203 West Spring Creek Place, Springville, UT 84663. ASD. Tel: (800) 998-5664. Fax: (801) 489-3307. Email: techsupport@ashfordformula.com. www.ashfordformula.com
- B. Substitutions: See Section 016000 - Product Requirements.

2.2 MATERIALS

- A. Cure-Seal-Hardener: Ashford Formula; water-based chemically-reactive penetrating sealer and hardener, that seals by densifying concrete so that water molecules cannot pass through but air and water vapor can, while allowing concrete to achieve full compressive strength, minimizing surface crazing, and eliminating dusting.
 - 1. Colorless, transparent, odorless, non-toxic, non-flammable.
 - 2. Containing no solvents or volatile organic compounds.

SECTION 03356

CONCRETE FLOOR FINISHING

3. USDA approved for food handling facilities.
 4. Allowing traffic on floors within 2 to 3 hours, with chemical process complete within 3 months.
 5. No change to surface appearance except a sheen developed due to traffic and cleaning.
- B. Water: Clean, potable.

PART 3 – EXECUTION

3.1 EXAMINATION

- A. Verify that floor surfaces are acceptable to receive the work of this section.

3.2 FLOOR FINISHING

- A. Finish concrete floor surfaces in accordance with ACI 301 and ACI 302.1R.
- B. Wood float surfaces that will receive quarry tile, ceramic tile, or cementitious terrazzo with full bed setting system.
- C. Steel trowel surfaces that will receive carpeting or resilient flooring.
- D. Steel trowel surfaces that are scheduled to be exposed.
- E. In areas with floor drains, maintain design floor elevation at walls; slope surfaces uniformly to drains at 1/8 inch per foot nominal.

3.3 FLOOR SURFACE TREATMENT

END OF SECTION

SECTION 03395

CURING, SEALING, AND HARDENING CONCRETE FLOORS

PART 1 – PRODUCTS

1.1 MANUFACTURERS

- A. Acceptable Manufacturer: Curecrete Distribution, Inc; 1203 West Spring Creek Place, Springville, UT 84663. ASD. Tel: (800) 998-5664. Fax: (801) 489-3307. Email: techsupport@ashfordformula.com. www.ashfordformula.com
- B. Substitutions: See Section 01600 - Product Requirements.

1.2 MATERIALS

- A. Cure-Seal-Hardener: Ashford Formula; water-based chemically-reactive penetrating sealer and hardener, that seals by densifying concrete so that water molecules cannot pass through but air and water vapor can, while allowing concrete to achieve full compressive strength, minimizing surface crazing, and eliminating dusting.
 - 1. Colorless, transparent, odorless, non-toxic, non-flammable.
 - 2. Containing no solvents or volatile organic compounds.
 - 3. USDA approved for food handling facilities.
 - 4. Allowing traffic on floors within 2 to 3 hours, with chemical process complete within 3 months.
 - 5. No change to surface appearance except a sheen developed due to traffic and cleaning.
- B. Water: Clean, potable.

END OF SECTION

SECTION 03415

PRECAST CONCRETE HOLLOW CORE PLANKS

PART 1 – GENERAL

1.1 SECTION INCLUDES

- A. Precast floor and roof planks.
- B. Connection plates with brackets and hangers.
- C. Grouting plank joint keys.

1.2 RELATED SECTIONS

- A. Section 03300 - Cast-In-Place Concrete.
- B. Section 03411 - Precast Concrete Wall Panels.
- C. Section 05120 - Structural Steel: Supporting steel beams and lintels
- D. Section 07900 - Joint Sealers: Caulking of butt joints of precast units at exposed underside of floor members.

1.3 REFERENCES

- A. Unless otherwise noted, the most current issue of references shall be used.
- B. ACI 301 - Specifications for Structural Concrete for Buildings; American Concrete Institute International.
- C. ACI 318 - Building Code Requirements for Reinforced Concrete and Commentary; American Concrete Institute International.
- D. ASTM A 36/A 36M - Standard Specification for Carbon Structural Steel.
- E. ASTM A 416/A 416M - Standard Specification for Steel Strand, Uncoated Seven-Wire for Prestressed Concrete.
- F. ASTM A 615/A 615M - Standard Specification for Deformed and Plain Billet-Steel Bars for Concrete Reinforcement.
- G. AWS B2.1 - Specification for Welding Procedure and Performance Qualification; American Welding Society.
- H. AWS D1.1 - Structural Welding Code - Steel; American Welding Society.
- I. AWS D1.4 - Structural Welding Code - Reinforcing Steel; American Welding Society.
- J. PCI JR-307 - Tolerances for Precast and Prestressed Concrete; Precast/Prestressed Concrete Institute.
- K. PCI MNL-116 - Manual for Quality Control for Plants and Production of Structural Precast Concrete Products; Precast/Prestressed Concrete Institute.
- L. PCI MNL-120 - PCI Design Handbook - Precast and Prestressed Concrete; Precast/Prestressed Concrete Institute.
- M. PCI MNL-123 - Design and Typical Details of Connections for Precast and Prestressed Concrete; Precast/Prestressed Concrete Institute.
- N. PCI MNL-124 - Design for Fire Resistance of Precast Prestressed Concrete; Precast/Prestressed Concrete Institute.
- O. PCI MNL-126 - Manual For The Design of Hollow Core Slabs; Precast/Prestressed Concrete Institute.
- P. PCI MNL-135 - Tolerance Manual For Precast and Prestressed Concrete Construction; Precast/Prestressed Concrete Institute.
- Q. UL (FRD) - Fire Resistance Directory; Underwriters Laboratories Inc.; current edition.

1.4 DESIGN REQUIREMENTS

- A. Design planks in accordance with the requirements of PCI MNL-120, PCI MNL 126, PCI MNL-124, ACI 318, and ACI 301.
- B. Design connections in accordance with PCI MNL-123.
- C. Design components to withstand dead loads and design loads in the configuration indicated on the drawings and as follows:
 - 1. Roof Assembly: 30 lb/sq ft live load, except where Codes require greater snow loads.
 - 2. Floor Assembly: 50 lb/sq ft live load, except 100 PSF for Corridors and Storage area and where Codes require greater load capacities.

SECTION 03415

PRECAST CONCRETE HOLLOW CORE PLANKS

3. Maximum Allowable Deflection of Roof Planks: 1/360 span, cambered to achieve slope to drain.
4. Maximum Allowable Deflection of Floor Planks: 1/360 span, cambered to achieve flat surface under dead load.
5. Design components to accommodate construction tolerances, deflection of other building structural members and clearances of intended openings.
6. Grouted Keys: Capable of transmitting horizontal shear force of 2,000 lb/ft.
- D. Fire Resistance: Provide designs tested to provide ratings as follows:
 1. Floor Assembly: (1) hour rating.

1.5 SUBMITTALS FOR REVIEW

- A. See Section 01300 - Administrative Requirements, for submittal procedures.
- B. Product Data: Indicate standard component configuration, design loads, deflections, and cambers.
- C. Shop Drawings: Indicate plank locations, layout, unit identification marks, connection details, edge conditions, bearing requirements, support conditions, dimensions, openings, openings intended to be field cut, and relationship to adjacent materials.
- D. Design Data: Indicate calculations for loadings and stresses of planks and prestressing signed and sealed by a Structural Engineer licensed in the state where the project is located.
- E. Fabricators Installation Instructions: Indicate special procedures and perimeter conditions requiring special consideration.

1.6 QUALITY ASSURANCE

- A. Designer Qualifications: Under direct supervision of a Professional Structural Engineer experienced in design of this Work and licensed in the State in which the Project is located.
- B. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section, with not less than 5 years of documented experience.
- C. Erector Qualifications: Company specializing in performing the type of work specified in this section, with minimum 5 years of documented experience.
- D. Welder Qualifications: Qualified within previous 12 months in accordance with AWS B2.1.
- E. Design planks in accordance with the requirements of:
 1. PCI MNL-120 - Design Handbook.
 2. PCI MNL-126 - Manual for the Design of Hollow Core Slabs.
 3. PCI MNL-124 - Design for Fire Resistance of Precast Prestressed Concrete.
 4. ACI 318.
 5. ACI 301.
- F. Design connections in accordance with PCI MNL-123 - Manual on Design of Connections for Precast Prestressed Concrete.
- G. Produce planks in accordance with requirements of PCI MNL-116. Maintain plant records and quality control program during production of precast planks. Make records available upon request.

1.7 PRE-INSTALLATION MEETING

- A. Convene one week before starting work of this section.
- B. Discuss anchor and weld plate locations, sleeve locations, and cautions regarding cutting or core drilling.

1.8 DELIVERY, STORAGE, AND HANDLING

- A. Lifting or Handling Devices: Capable of supporting member in positions anticipated during manufacture, storage, transportation, and erection.
- B. Mark each member with date of production and final position in structure.

SECTION 03415

PRECAST CONCRETE HOLLOW CORE PLANKS

1.9 PROJECT CONDITIONS

- A. Coordinate with framing components directly associated with the work of this section.
- B. Coordinate field cut openings with affected section.
- C. Coordinate location of hanger tabs and devices for architectural, mechanical and electrical work.
- D. The Contractor shall be responsible for any size variations between construction documents and actual plank widths.

PART 2 – PRODUCTS

2.1 MANUFACTURERS

- A. Precast Planks:
 - 1. Calumet Flexicore Corp: www.members.aol.com/flexicore
 - 2. Flexicore Systems, Inc: www.flexicore.com
 - 3. Spancrete Industries, Inc: www.spancrete.com
 - 4. Material Service Corp., Chicago, IL – Product: Dy-Core
 - 5. Fabcon, Incorporated, Naperville, IL – Product: Spandek
 - 6. The Contractor shall notify any other effected trades of size variations
 - 7. Substitutions: See Section 01600 - Product Requirements

2.2 MATERIALS

- A. Concrete Materials: ACI 301.
- B. Connecting and Supporting Devices: Plates, angles, and inserts: conforming to PCI MNL-123.
- C. Tensioning Steel Tendons: ASTM A 416/A 416M, Grade 250 (1725); seven-wire stranded steel cable; low-relaxation type; full length without splices; uncoated.
- D. Reinforcing Steel: ASTM A 615/A 615M Grade 40 (280) deformed steel bars.
- E. Non-Shrink Grout: Non-metallic, minimum compressive strength of 10,000 psi at 28 days.
- F. Cement Grout: Minimum compressive strength of 3,000 psi at 28 days.
- G. Steel Plates and Shapes: ASTM A36.

2.3 ACCESSORIES

- A. Connecting and Supporting Devices: Plates, angles, items cast into concrete, items connected to steel framing members, and inserts: ASTM A 36/A 36M carbon steel; prime painted.
- B. Core Hole End Plugs: Cardboard insert with stiff concrete fill.
- C. Hanger Tabs: Galvanized steel, designed to fit into grouted key joints, capable of supporting 500 lbs dead load, predrilled to receive hanger.
- D. Bearing Pads: High density plastic, 1/8 inch thick, smooth on one side. Vulcanized elastomeric compound molded to size.
- E. Sill Seal: Compressible glass fiber strips.

2.4 FABRICATION

- A. Planks: Plant cast, prestressed, hollow core.
 - 1. Dimensions as indicated on drawings.
- B. Weld reinforcing in accordance with AWS D1.4.
- C. Embed anchors, inserts, plates, angles, and other items at locations indicated.
- D. Provide openings required by other sections, at locations indicated. Coordinate openings required with all drawings and trades.
- E. Cut exposed ends flush. Fill all Core Hole End Plugs at plank ends with Cardboard insert with stiff concrete fill. Fill must project a minimum of 8 inches into plank.
- F. Plant Finish: Finish members to PCI MNL-116 Commercial Grade.
- G. Connecting and Supporting Steel Devices: Do not paint surfaces in contact with concrete or surfaces requiring field welding.

2.5 FABRICATION TOLERANCES

- A. Conform to PCI MNL-116, PCI JR307 and PCI MNL-135.

SECTION 03415

PRECAST CONCRETE HOLLOW CORE PLANKS

2.6 SOURCE QUALITY CONTROL AND TESTS

- A. See Section 03300 for testing of concrete and grout, materials, and mix designs.
- B. Produce planks in accordance with requirements of PCI MNL-116. Maintain plant records and quality control program during production of precast planks. Make records available upon request.
- C. Inspect and test stressing tendons before delivery for compliance with specified standards.

PART 3 – EXECUTION

3.1 EXAMINATION

- A. Verify that site conditions are ready to receive work and field measurements are as indicated on shop drawings.
- B. Verify supporting structure is ready to receive work.

3.2 PREPARATION

- A. Prepare support devices for the erection procedure and temporary bracing.

3.3 ERECTION

- A. Erect members without damage to structural capacity, shape, or finish. Replace or repair damaged members.
- B. Install bearing pads and sill seal at bearing ends of planks as indicated.
- C. Align and maintain uniform horizontal and end joints, as erection progresses.
- D. Maintain temporary bracing in place until final connection is made. Protect members from staining.
- E. Adjust differential camber between precast members to tolerance before final attachment and grouting.
- F. Adjust differential elevation between precast members to tolerance before final attachment.
- G. Install hanger tabs in joints at 48 inches on center.
- H. Secure units in place. Perform welding in accordance with AWS D1.1.
- I. Grout longitudinal keys as indicated.
- J. Tape seal underside of plank joints to prevent grout leakage.
- K. Make plank-to-plank joints smooth using grout, troweled smooth. Transition differential elevation of adjoining planks with grout to a maximum slope of 1:12.

3.4 ERECTION TOLERANCES

- A. Erect members level and plumb within allowable tolerances. Conform to PCI MNL-135, except as specifically amended below.
- B. Erect to the following tolerances:
 - 1. Plan Location from Building Grid Datum: Plus or minus 3/4 in.
 - 2. Top Elevation from Building Elevation Datum at Plank Ends: Plus or minus 1/2 inch.
 - 3. Maximum Jog in Alignment of Matching Ends: Plus or minus 1/2 inch.
 - 4. Exposed Joint Dimension: Plus or minus 3/8 inch.
 - 5. Differential Top Elevation As Erected: Plus or minus 3/8 inch.
 - 6. Bearing Length in Span Direction: Plus or minus 3/8 inch.
 - 7. Differential Bottom Elevation of Exposed Planks: Plus or minus 3/16 inch.

3.5 PROTECTION OF FINISHED WORK

- A. Protect members from damage caused by field welding or erection operations.
- B. Provide non-combustible shields during welding operations.

3.6 CLEANING

- A. Clean weld marks, dirt, and blemishes from surface of exposed members.

END OF SECTION

SECTION 03505

SELF-LEVELING UNDERLAYMENT

PART 1 – GENERAL

1.1 SECTION INCLUDES

- A. Liquid applied cementitious self-leveling floor underlayment.

1.2 REFERENCES

- A. Unless otherwise noted the most current issue of the reference shall be used.
- B. ASTM E84 – Standard Test Method for Surface Burning Characteristics of Building Materials.

1.3 SUBMITTALS

- A. See Section 01300 – Administrative Requirements, for submittal procedures.
- B. Product Data: Provide physical characteristics, product limitations
- C. Manufacturer's Instructions: Indicate mix instructions.

1.4 QUALITY ASSURANCE

- A. Applicator Qualifications: Company specializing in performing the work of this section and approved by the manufacturer.

1.5 REGULATORY REQUIREMENTS

- A. Conform to applicable code for combustibility or flame spread requirements.

1.6 ENVIRONMENTAL REQUIREMENTS

- A. Do not install underlayment until floor penetrations and peripheral work are complete.
- B. Maintain ambient temperatures of 50 degrees for 24 hours before, during and 72 hours after installation of underlayment.
- C. During the curing process, ventilate spaces to remove excess moisture.

PART 2 – PRODUCTS

2.1 MANUFACTURERS

- A. Cementitious Underlayment:
 - 1. Ardex Engineered Cements, Inc.: www.ardex.com.
 - 2. Dayton Superior Corporation: www.daytonsuperior.com
 - 3. Dependable Chemical Co., Inc.: www.floorprep.com.
 - 4. Substitutions: See Section 01600 - Product Requirements.

2.2 ACCESSORIES

- A. Provide all primers, cleaners, bonding agents or any other accessory materials recommended by the manufacturer for the intended installation.

2.3 MIXING

- A. Site mix materials in accordance with manufacturer's instructions.
- B. Mix to achieve following characteristics:
 - 1. Density: 100 lb/cu ft minimum dry density.
 - 2. Compressive strength: 1,000 psi minimum.
 - 3. Surface burning characteristics: Flame spread/smoke developed index of 0/0 in accordance with ASTM E 84.
- C. Mix to self-leveling consistency.

SECTION 03505

SELF-LEVELING UNDERLAYMENT

PART 3 – EXECUTION

3.1 EXAMINATION

- A. Verify that substrate surfaces are clean, dry, unfrozen, do not contain petroleum bi-products or other compounds detrimental to underlayment material bond to substrate.

3.2 PREPARATION

- A. Remove substrate surface irregularities. Fill voids and deck joints with latex based filler. Finish smooth.
- B. Vacuum clean surfaces.
- C. Prime substrate in accordance with manufacturer's instructions. Allow to dry.

3.3 APPLICATION

- A. Install underlayment in accordance with manufacturer's instructions.
- B. Install underlayment as required, or as directed by the Architect, to correct any imperfections or irregularities which have caused the floor to be out of level.

3.4 CURING

- A. Air cure in accordance with manufacturer's instructions.

3.5 APPLICATION TOLERANCE

- A. Top Surface: Level to 1/8 inch in 5 feet.

3.6 PROTECTION OF FINISHED WORK

- A. Do not permit traffic over unprotected floor underlayment surfaces.

3.7 SCHEDULES

- A. Level all floor surfaces which will receive new flooring materials.

END OF SECTION

SECTION 04065

MORTAR AND MASONRY GROUT

PART 1 – GENERAL

1.1 SECTION INCLUDES

- A. Mortar for masonry.
- B. Grout for masonry.

1.2 RELATED SECTIONS

- A. Section 01400 - Quality Requirements: Testing laboratory services.
- B. Section 04810 - Unit Masonry Assemblies: Installation of mortar and grout.
- C. Section 08110 - Steel Doors and Frames: Grouting steel door frames installed in masonry.
- D. Section 08110 - Steel doors and Frames: Grouting steel door frames.

1.3 REFERENCES

- A. Unless otherwise noted the most current issue of the reference shall be used.
- B. ACI 530/ASCE 5/TMS 402 - Building Code Requirements For Masonry Structures; American Concrete Institute International;
- C. ACI 530.1/ASCE 6/TMS 602 - Specification for Masonry Structures; American Concrete Institute International.
- D. ASTM C 5 - Standard Specification for Quicklime for Structural Purposes.
- E. ASTM C 199 - Test Method for Pier Test for Refractory Masonry.
- F. ASTM C 207 - Standard Specification for Hydrated Lime for Masonry Purposes.
- G. ASTM C 387 - Standard Specification for Packaged, Dry, Combined Materials for Mortar and Concrete.
- H. ASTM C 404 - Standard Specification for Aggregates for Masonry Grout.
- I. ASTM E514 -90 - Standard Test Method for Water Penetration and Leakage Through Masonry
- J. ASTM C 1384 - Standard Specification for Modifiers for Masonry Mortars.
- K. ASTM C 1388 - Standard Test Method for Compressive Strength of Laboratory Constructed Masonry Prisms.
- L. Contractor to verify that specified cleaning is done during progress of work and at the completion of each subcontractor's work.

1.4 SUBMITTALS

- A. See Section 01300 - Administrative Requirements, for submittal procedures.
- B. Product Data: Include design mix and indicate whether the Proportion or Property specification of ASTM C 270 is to be used. Also include required environmental conditions and admixture limitations.
- C. Samples: Submit two samples of mortar, illustrating mortar color and color range.
- D. Contractor shall retain the services of an independent testing laboratory to test, evaluate and report on the following:
 - 1. Submit reports on mortar indicating compliance with component mortar materials to requirements of ASTM C 270 and test and evaluation reports per ASTM C 780.
 - 2. Reports: Submit reports on grout indicating compliance with component grout materials to requirements of ASTM C 476 and test and evaluation reports to requirements of ASTM C
- E. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.
- F. Manufacturer's Instructions: Submit packaged dry mortar manufacturer's installation instructions.

1.5 QUALITY ASSURANCE

- A. Comply with provisions of ACI 530/ASCE 5/TMS 402 and ACI 530.1/ASCE 6/TMS 602, except where exceeded by requirements of the contract documents.
 - 1. Maintain one copy of each document on project site.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Maintain packaged materials clean, dry, and protected against dampness, freezing, and foreign matter.

SECTION 04065

MORTAR AND MASONRY GROUT

1.7 ENVIRONMENTAL REQUIREMENTS

- A. Maintain materials and surrounding air temperature to minimum 40 degrees F prior to, during, and 48 hours after completion of masonry work.
- B. Cold Weather Requirements: Comply with recommendations of ACI 530.1
- C. Maintain materials and surrounding air temperature to maximum 90 degrees F prior to, during, and 48 hours after completion of masonry work.
- D. Hot Weather Requirements: Comply with recommendations of ACI 530.1

PART 2 – PRODUCTS

2.1 MATERIALS

- A. Masonry Cement: ASTM C 91, Type S.
 - 1. Colored Mortar: Premixed cement as required to match Architect's sample.
- B. Portland Cement: ASTM C 150, Type I – Normal, or Type II - Moderate; standard gray color.
- C. Blended Cement: ASTM C 595, Type IP or i(PM) for type I or II cement..
- D. Packaged Dry Mortar: ASTM C 387, using gray color cement.
- E. Hydrated Lime: ASTM C 207, Type S or M.
- F. Mortar Aggregate: ASTM C 144, standard masonry type.
- G. Grout Aggregate: ASTM C 404.
- H. Pigments for Colored Mortar: Iron or chromium oxides with demonstrated stability and colorfastness. Do not use carbon black.
 - 1. ASTM C 979: Pigment shall not exceed 10% of the weight of portland cement.
 - 2. Colors: As required to match Architect's color samples.
 - 3. Acceptable products:
 - a. Soloman Colors: www.solomoncolors.com
 - b. Davis Colors: www.concretestains.com
 - c. Color Solutions, Inc.: www.dynamiccolorsolutions.com
 - d. Prism Pigments: www.prismpigments.com
 - e. Western Lime and Cement Co.
 - 4. Substitutions: See Section 01600 - Product Requirements.
- I. Water: Clean and potable.
- J. Accelerating Admixture: Not Permitted.
- K. Moisture-Resistant Admixture: Water repellent compound designed to reduce capillarity; Integral liquid polymeric admixture for mortar added during mixing, capable of achieving a Class E Rating when evaluated using ASTM E 514 with the test extended to 72 hours, using the rating criteria specified in ASTM E 514.
- L. Bonding Agent: Latex type.

2.2 MORTAR MIXES

- A. Mortar for Unit Masonry: ASTM C 270, Property Specification.
 - 1. Engineered Masonry: Type S.
 - 2. Masonry below grade and in contact with earth: Type S.
 - 3. Exterior, loadbearing masonry: Type M or S.
 - 4. Exterior, non-loadbearing masonry: Type M or S.
 - 5. Interior, loadbearing masonry: Type M or S.
 - 6. Interior, non-loadbearing masonry: Type N.
 - 7. Glass unit masonry: Type N or S.
 - 8. Pointing mortar: Prehydrated Type N with maximum 2 percent ammonium stearate or calcium stearate per cement weight.
- B. Stain Resistant Pointing Mortar: One part Portland cement, 1/8 part hydrated lime, and two parts graded (80 mesh) aggregate, proportioned by volume. Add aluminum tristearate, calcium stearate, or ammonium stearate equal to 2 percent of Portland cement by weight.
- C. Pointing Mortar For Glass Unit Masonry: ASTM C 270, Prehydrated Type M, using the Property Specification.

SECTION 04065

MORTAR AND MASONRY GROUT

1. Maximum 2 percent ammonium stearate or calcium stearate per cement weight.
2. Beach sand aggregate.
- D. Mortar for Stone: ASTM C 270, Property Specification.
 1. Setting mortar:
 - a. Granite: Type S mortar.
 - b. Limestone: Type N mortar.
 - c. Marble: Type S mortar.
 - d. Travertine: Type S mortar.
 - e. Quartz-based stone: Type N mortar.
 - f. Slate: Type S mortar.
 2. Pointing mortar:
 - a. Granite: Type S mortar.
 - b. Limestone: Type N mortar.
 - c. Marble: Type N mortar.
 - d. Travertine: Type N mortar.
 - e. Quartz-based stone: Type N mortar.
 - f. Slate: Type N mortar.
- E. Colored Mortar: Proportion selected pigments and other ingredients to match Architect's sample, without exceeding manufacturer's recommended pigment-to-cement ratio.

2.3 MORTAR MIXING

- A. Thoroughly mix mortar ingredients using mechanical batch mixer, in accordance with ASTM C 270 and in quantities needed for immediate use.
- B. Maintain sand uniformly damp immediately before the mixing process.
- C. Add mortar color in accordance with manufacturer's instructions. Provide uniformity of mix and coloration.
- D. Do not use anti-freeze compounds to lower the freezing point of mortar. Do not use set accelerators unless approved in writing by The Brick Institute of America (BIA), National Concrete Masonry Association (NCMA), ASTM C 270, the Architect of Record and the Engineer of Record. The use of admixtures does not relax cold weather protection requirements.
- E. If water is lost by evaporation, re-temper only within two hours of mixing.
- F. Use mortar within two hours after mixing at temperatures of 90 degrees F, or two-and-one-half hours at temperatures under 40 degrees F.

2.4 GROUT MIXES

- A. Bond Beams and Lintels: 3,000 psi strength at 28 days; 8-10 inches slump; provide grout in accordance with ASTM C 476. Use or fine grout in accordance with ACI 530 and 530.1.
- B. Engineered Masonry: Unless otherwise noted provide grout with 3,000 psi strength at 28 days; 7-8 inches slump; mix in accordance with ASTM C 476.
 1. Coarse grout for spaces with smallest horizontal dimension greater than 2 inches.

2.5 GROUT MIXING

- A. Thoroughly mix grout ingredients in quantities needed for immediate use in accordance with ASTM C 476
- B. Add admixtures in accordance with manufacturer's instructions; mix uniformly.
- C. Do not use anti-freeze compounds to lower the freezing point of grout. Do not use set accelerators unless approved in writing by The Brick Institute of America (BIA), National Concrete Masonry Association (NCMA), ASTM C 270, the Architect of Record and the Engineer of Record. The use of admixtures does not relax cold weather protection requirements.

2.6 PRECONSTRUCTION TESTING

- A. Testing will be conducted by an independent test agency, in accordance with provisions of Section 01400.

SECTION 04065

MORTAR AND MASONRY GROUT

- B. Mortar Mixes: Test mortars pre-batched by weight in accordance with ASTM C 270 or ASTM C 780 recommendations for preconstruction testing for compressive strength, consistency, mortar aggregate ratio, water content, air content and splitting tensile strength.
 - 1. Test results will be used to establish optimum mortar proportions and establish quality control values for construction testing.
- C. Grout Mixes: Test grout batches in accordance with ASTM C 1019 procedures for compressive strength and slump.
 - 1. Test results will be used to establish optimum grout proportions and establish quality control values for construction testing.

PART 3 – EXECUTION

3.1 PREPARATION

- A. Apply bonding agent to existing smooth finish concrete surfaces.
 - 1. Plug clean-out holes for masonry with brick or masonry units to match adjacent surfaces.
Brace masonry for wet grout pressure.
- B. Request inspection of spaces to be grouted.

3.2 INSTALLATION

- A. Install mortar and grout to requirements of Section 04810; and in accordance with ACI 530.1/ASCE 6.
- B. Work grout into masonry cores and cavities to eliminate voids.
- C. Do not install grout in lifts greater than 16 inches without consolidating grout by rodding.
- D. Do not displace reinforcement while placing grout.
- E. Remove excess mortar from grout spaces.

3.3 GROUTING

- A. Use either high-lift or low-lift grouting techniques, at Contractor's option, in accordance with ACI 530.1.
- B. Consolidate grout with a mechanical vibrator on any grout pours greater than 12 inches in height; and in accordance with ACI 530.1. Grout pours 12 inches or less in height shall be mechanically vibrated or puddled. Do not over consolidate.
- C. When grouting is stopped for 1 hour or longer, stop the grout pour 1 1/2 inches below the top of the masonry to create a shear key.
- D. Pour grout only after reinforcing is in place. Prevent displacement of bars as grout is poured.
- E. Place grout for each pour continuously and consolidate immediately; do not interrupt pours for more than 1-1/2 hours.
- F. Place grout for spanning elements in single, continuous pour.

3.4 FIELD QUALITY CONTROL

- A. An independent testing agency will perform field tests, in accordance with provisions of Section 01400.
 - 1. Tests and evaluation listed in this Article will be performed during construction for each 5000 square feet of wall area or fraction thereof.
- B. Test and evaluate mortar in accordance with ASTM C 780 procedures.
 - 1. Test with same frequency as specified for masonry units.
- C. Test and evaluate grout in accordance with ASTM C 1019 procedures.
 - 1. Test with same frequency as specified for masonry units.
- D. Prism Tests: Test masonry and mortar panels for compressive strength in accordance with ASTM C 1388, and for flexural bond strength in accordance with ASTM C 1072 or ASTM E 518; perform tests and evaluate results as specified in individual masonry sections
 - 1. Prepare set of prisms for testing at 7 days and 1 set for testing at 28 day

END OF SECTION

SECTION 04720

ARCHITECTURAL CAST STONE

PART 1 – GENERAL

1.1 SECTION INCLUDES

- A. Architectural cast stone.
- B. Units required are indicated on the drawings as “cast stone”.

1.2 RELATED SECTIONS

- A. Section 04810 - Unit Masonry Assemblies: Installation of cast stone in conjunction with masonry.
- B. Section 07900 - Joint Sealers: Materials and execution methods for sealing soft joints in cast stone work.

1.3 REFERENCES

- A. Unless otherwise noted the most current issue of the reference shall be used.
- B. ACI 318 - Building Code Requirements for Reinforced Concrete.
- C. ASTM A 185 - Standard Specification for Steel Welded Wire Reinforcement, Plain, for Concrete.
- D. ASTM A 615/A 615M - Standard Specification for Deformed and Plain Billet-Steel Bars for Concrete Reinforcement.
- E. ASTM C 33 – Standard Specification for Concrete Aggregates.
- F. ASTM C 150 – Standard Specification for Portland Cement.
- G. ASTM C 270 – Standard Specification for Mortar for Unit Masonry.
- H. ASTM C 494/C 494M - Standard Specification for Chemical Admixtures for Concrete.
- I. ASTM C 642 – Standard Test Method for Density, Absorption, and Voids in Hardened Concrete.
- J. ASTM C 979 - Standard Specification for Pigments for Integrally Colored Concrete.
- K. ASTM C 1364 – Standard Specification for Architectural Cast Stone.

1.4 SUBMITTALS

- A. See Section 01300 - Administrative Requirements, for submittal procedures.
- B. Manufacturer's Qualification Data: Documentation showing compliance with specified requirements.
- C. Product Data: Test results of cast stone components made previously by the manufacturer.
 - 1. Include one copy of ASTM C 1364 for Architect's use.
- D. Shop Drawings: Include building elevations and plans showing the exact location of each cast stone piece. Drawings shall show the exposed faces, sections, dimensions, arrangement of joints, anchoring methods, type of anchors, and piece numbers and location of anchors, section cuts, joint, and finish details.
 - 1. Manufacturer is responsible for design of all connections.
- E. Verification Samples: Pieces of actual cast stone components not less than 12 inches square, illustrating range of color and texture to be anticipated in components furnished for the project.
- F. Provide Mortar Color Selection Samples.

1.5 QUALITY ASSURANCE

- A. Design anchors and supports under direct supervision of a Professional Structural Engineer, registered in the State in which the Project is located.
 - 1. Design anchors to resist positive and negative wind pressures and other loads as required by applicable code.
 - 2. Design anchor attachment to stone with a factor of safety of 5:1.
 - 3. Design each individual anchor with a factor of safety in the vertical dead-load-bearing direction of 4:1 and in the horizontal lateral-load-bearing direction of 2:1.
- B. Manufacturer Qualifications: A current producer member of the Cast Stone Institute with a minimum of 5 years of experience in producing cast stone of the types required for project and:
 - 1. Adequate plant capacity to furnish quality, sizes, and quantity of cast stone required without delaying progress of the work.
 - 2. Products previously produced by plant and exposed to weather that exhibit satisfactory appearance.

SECTION 04720

ARCHITECTURAL CAST STONE

- C. Mock-Up: Provide full size cast stone components for installation in mock-up of exterior wall.
 - 1. Approved mock-up will become standard for appearance and workmanship.
 - 2. Mock-up may not remain as part of the completed work.
 - 3. Remove mock-up not incorporated into the work and dispose of debris.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Deliver cast stone components secured to shipping pallets and protected from damage and discoloration. Protect corners from damage.
- B. Number each piece individually to match shop drawings and schedule.
- C. Store cast stone components and installation materials in accordance with manufacturer's instructions.
- D. Store cast stone components on pallets with nonstaining, waterproof covers. Ventilate under covers to prevent condensation. Prevent contact with dirt.
- E. Protect cast stone components during handling and installation to prevent chipping, cracking, or other damage.
- F. Store mortar materials where contamination can be avoided.
- G. Schedule and coordinate production and delivery of cast stone components with unit masonry work to optimize on-site inventory and to avoid delaying the work.

PART 2 – PRODUCTS

2.1 MANUFACTURERS

- A. Architectural Cast Stone:
 - 1. Any current producer member of the Cast Stone Institute.
 - 2. American Artstone Co., Inc., New Ulm, MN.
 - 3. Architectural Ornaments, Inc., Kansas City, MO.
 - 4. Edwards Cast Stone Company, Dubuque, IA.

2.2 ARCHITECTURAL CAST STONE

- A. Cast Stone: Architectural concrete product manufactured to simulate appearance of natural limestone, complying with ASTM C 1364.
 - 1. Compressive Strength: As specified in ASTM C 1364; calculate strength of pieces to be field cut at 80 percent of uncut piece.
 - 2. Freeze-Thaw Resistance: Demonstrated by laboratory testing in accordance with ASTM C 1364.
 - 3. Absorption: ASTM C 1195 or ASTM C 642: 6 % maximum for products at 28 days.
 - 4. Surface Texture: Medium grained texture, with no bugholes, air voids, or other surface blemishes visible from distance of 20 feet.
 - 5. Color: Match sample on file at Architect's office.
 - 6. Remove cement film from exposed surfaces before packaging for shipment.
- B. Shapes: Provide shapes indicated on drawings.
 - 1. Variation from Any Dimension, Including Bow, Camber, and Twist: Maximum of plus/minus 1/8 inch or length divided by 360, whichever is greater, but not more than 1/4 inch.
 - 2. Unless otherwise indicated on drawings, provide:
 - a. Wash or slope of 1:12 on exterior horizontal surfaces.
 - b. Drips on projecting components, wherever possible.
 - c. Raised fillets at back of sills and at ends to be built in.
- C. Reinforcement: Provide reinforcement as required to withstand handling and structural stresses; comply with ACI 318.

2.3 MATERIALS

- A. Portland Cement: ASTM C 150.
 - 1. For Units: Type I, white or gray as required to match Architect 's sample.
 - 2. For Mortar: Type I or II, except Type III may be used in cold weather.

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ARCHITECTURAL CAST STONE

- B. Coarse Aggregate: ASTM C 33, except for gradation; granite, quartz, or limestone.
- C. Fine Aggregate: ASTM C 33, except for gradation; natural or manufactured sands.
- D. Pigments: ASTM C 979, inorganic iron oxides; do not use carbon black.
- E. Admixtures: ASTM C 494/C 494M.
- F. Water: Potable.
- G. Reinforcing Bars: ASTM A 615/A 615M deformed bars, galvanized.
- H. Steel Welded Wire Reinforcement: ASTM A 185, galvanized.
- I. Embedded Anchors, Dowels, and Inserts: Type 304 stainless steel, of type and size as required for conditions.
- J. Mortar: Portland cement-lime, ASTM C 270, Type N; do not use masonry cement.
- K. Sealant: As specified in Section 07900.
- L. Cleaner: General-purpose cleaner designed for removing mortar and grout stains, efflorescence, and other construction stains from new masonry surfaces without discoloring or damaging masonry surfaces; approved for intended use by cast stone manufacturer and by cleaner manufacturer for use on cast stone and adjacent masonry materials.

PART 3 – EXECUTION

3.1 EXAMINATION

- A. Examine construction to receive cast stone components. Notify Architect if construction is not acceptable.
- B. Do not begin installation until unacceptable conditions have been corrected.

3.2 INSTALLATION

- A. Install cast stone components in conjunction with masonry, complying with requirements of Section 04810.
- B. Mechanically anchor cast stone units indicated; set remainder in mortar.
- C. Setting:
 - 1. Drench cast stone components with clear, running water immediately before installation.
 - 2. Set units in a full bed of mortar unless otherwise detailed.
 - 3. Fill vertical joints with mortar.
 - 4. Fill dowel holes and anchor slots completely with mortar or non-shrink grout.
- D. Joints: Make all joints 3/8 inch, except as otherwise detailed.
 - 1. Rake mortar joints 3/4 inch for pointing. Scrub face of each stone to remove excess mortar before it sets.
 - 2. Point joints with mortar in layers 3/8 inch thick and tool to a slight concave profile.
 - 3. Rake the following mortar joints for sealant. Scrub face of each stone to remove excess mortar before it sets.
 - a. Head joints in top courses, including copings, parapets, cornices, sills, and steps.
 - b. Joints in projecting units.
 - c. Joints between rigidly anchored units, including soffits, panels, and column covers.
 - d. Joints below lugged sills and stair treads.
 - e. Joints below ledge and relieving angles.
 - f. Joints labeled "expansion joint".
- E. Sealant Joints: Install backer rods and sealants as specified in Section 07900.
 - 1. Prime cast stone in areas to receive sealant and backer rod; in accordance with sealant manufacturer's and cast stone manufacturer's recommendations.
- F. Installation Tolerances:
 - 1. Variation from Plumb: Not more than 1/8 inch in 10 feet or 1/4 inch in 20 feet or more.
 - 2. Variation from Level: Not more than 1/8 inch in 10 feet or 1/4 inch in 20 feet, or 3/8 inch maximum.
 - 3. Variation in Joint Width: Not more than 1/8 inch in 36 inches or 1/4 of nominal joint width, whichever is less.

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ARCHITECTURAL CAST STONE

4. Variation in Plane Between Adjacent Surfaces (Lipping): Not more than 1/16 inch difference between planes of adjacent units or adjacent surfaces indicated to be flush with units.

3.3 CLEANING AND PROTECTION

- A. Repair chips and other surface damage noticeable when viewed in direct daylight at 10 feet.
 1. Repair with matching touchup material provided by the manufacturer and in accordance with manufacturer's instructions.
 2. Repair methods and results subject to Architect's approval.
- B. Clean cast stone components as work progresses; remove mortar fins and smears before tooling joints.
- C. Clean exposed cast stone after mortar is thoroughly set and cured.
 1. Wet surfaces with water before applying cleaner.
 2. Apply cleaner to cast stone in accordance with manufacturer's instructions.
 3. Remove cleaner promptly by rinsing thoroughly with clear water.
 4. Do not use acidic cleaners.
- D. Protect from splashing by mortar and other damage.

END OF SECTION

SECTION 04810

UNIT MASONRY ASSEMBLIES

PART 1 – GENERAL

1.1 SECTION INCLUDES

- A. Concrete Masonry Units.
- B. Concrete Brick.
- C. Facing Brick.
- D. Reinforcement and Anchorage.
- E. Flashings.
- F. Accessories.

1.2 RELATED SECTIONS

- A. Section 03200 - Concrete Reinforcement: Reinforcing steel for grouted masonry.
- B. Section 04065 - Mortar and Masonry Grout.
- C. Section 05120 - Structural Steel: accessories for masonry construction.
- D. Section 05500 - Metal Fabrications: Loose steel lintels and fabricated steel items.
- E. Section 06100 - Rough Carpentry: Nailing strips built into masonry.
- F. Section 07212 - Board and Batt Insulation: Insulation for cavity spaces.
- G. Section 07620 - Sheet Metal Flashing and Trim: Rigid Through-wall masonry flashings.
- H. Section 07900 - Joint Sealers: Backing rod and sealant at control and expansion joints.

1.3 REFERENCES

- A. Unless otherwise noted the most current issue of the reference shall be used.
- B. ACI 530/ASCE 5/TMS 402 - Building Code Requirements for Masonry Structures; American Concrete Institute International.
- C. ACI 530.1/ASCE 6/TMS 602 - Specification For Masonry Structures; American Concrete Institute International.
- D. ASTM A 82 - Standard Specification for Steel Wire, Plain, for Concrete Reinforcement.
- E. ASTM D 1667 - Standard Specification for Flexible Cellular Materials—Vinyl Chloride Polymers and Copolymers (Closed-Cell Foam)
- F. ASTM - D2240 - Standard Test Method for Rubber Property-Durometer Hardness
- G. ASTM D 2287 - Standard Specification for Nonrigid Vinyl Chloride Polymer and Copolymer Molding and Extrusion Compounds
- H. ASTM A 615/A 615M - Standard Specification for Deformed and Plain Billet-Steel Bars for Concrete Reinforcement.
- I. ASTM A 641/A 641M - Standard Specification for Zinc-Coated (Galvanized) Carbon Steel Wire.
- J. ASTM A 653/A 653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
- K. ASTM A 666 - Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar.
- L. ASTM B 370 - Standard Specification for Copper Sheet and Strip for Building Construction.
- M. ASTM C 27 - Standard Classification of Fireclay and High-Alumina Refractory Brick.
- N. ASTM C 34 - Standard Specification for Structural Clay Load Bearing-Wall Tile.
- O. ASTM C 55 - Standard Specification for Concrete Brick; 2001a.
- P. ASTM C 56 - Standard Specification for Structural Clay Non-Load-Bearing Tile.
- Q. ASTM C 62 - Standard Specification for Building Brick (Solid Masonry Units Made From Clay or Shale).
- R. ASTM C 67 - Standard Test Methods for Sampling and Testing Brick and Structural Clay Tile.
- S. ASTM C 91 - Standard Specification for Masonry Cement.
- T. ASTM C 126 - Standard Specification for Ceramic Glazed Structural Clay Facing Tile, Facing Brick, and Solid Masonry Units.
- U. ASTM C 129 - Standard Specification for Nonloadbearing Concrete Masonry Units.
- V. ASTM C 140 - Standard Test Methods of Sampling and Testing Concrete Masonry Units and Related Units.
- W. ASTM C 144 - Standard Specification for Aggregate for Masonry Mortar.

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UNIT MASONRY ASSEMBLIES

- X. ASTM C 150 - Standard Specification for Portland Cement.
- Y. ASTM C 207 - Standard Specification for Hydrated Lime for Masonry Purposes.
- Z. ASTM C 212 - Standard Specification for Structural Clay Facing Tile.
- AA. ASTM C 270 - Standard Specification for Mortar for Unit Masonry.
- BB. ASTM C 315 - Standard Specification for Clay Flue Linings.
- CC. ASTM C 404 - Standard Specification for Aggregates for Masonry Grout.
- DD. ASTM C 476 - Standard Specification for Grout for Masonry.
- EE. ASTM C 530 - Standard Specification for Structural Clay Nonloadbearing Screen Tile.
- FF. ASTM C 652 - Standard Specification for Hollow Brick (Hollow Masonry Units Made From Clay or Shale).
- GG. ASTM C 744 - Standard Specification for Prefaced Concrete and Calcium Silicate Masonry Units.
- HH. ASTM C 780 - Standard Test Method for Preconstruction and Construction Evaluation of Mortars for Plain and Reinforced Unit Masonry.
- II. ASTM D 226 - Standard Specification for Asphalt-Saturated Organic Felt Used in Roofing and Waterproofing.
- JJ. ASTM E 514-90 - Standard Test Method for Water Penetration and Leakage Through Masonry

1.4 SUBMITTALS

- A. See Section 01300 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide data for masonry units, fabricated wire reinforcement, mortar, and all flashings including accessories and primer.
- C. Samples; submit three of each for review:
 - 1. Inside, outside corners self-adhering rubberized flashing end dams and outside corners.
 - 2. 2 inch x 6 inches wide x .015 inch thick stainless steel drip with hemmed edge.
 - 3. 2 inch x 1-5/8 inch wide x .015 inch thick stainless steel drip with hemmed edge.
 - 4. Sealant.
 - 5. 12 inch long section of Termination bar.
 - 6. Joint filler: full width x 6 inches long.
 - 7. Preformed Control Joints: 6 inches long.
 - 8. Weep/Cavity Vents: Manufacturer's full color range.
 - 9. Anchors: submit each type of anchor required.
 - 10. Facing Brick: submit bound units to illustrate color, texture, and extremes of color range and sizes.
 - 11. Decorative Concrete Masonry units: submit bound units to illustrate color, texture, and extremes of color range.
 - 12. Glazed Facing Brick: submit bound units to illustrate color, texture, and extremes of color range and sizes.
 - 13. Structural Clay Facing Tile: submit bound units to illustrate color, texture, and extremes of color range and sizes.
- D. Manufacturer's Certificate: Certify that masonry units meet or exceed specified requirements.

1.5 QUALITY ASSURANCE

- A. Comply with provisions of ACI 530/ASCE 5/TMS 402 and ACI 530.1/ASCE 6/TMS 602, except where exceeded by requirements of the contract documents.
 - 1. Maintain one copy of each document on project site.

1.6 MOCK-UP

- A. Construct a masonry wall as a mock-up panel sized 6 feet long by 4 feet high, which includes an exterior wall corner, flashing end dams and lap joints, window sill condition, cavity insulation with adhesive, mortar and accessories, all typical accessories, control joints with sealant, and structural backup.
- B. Locate where directed.

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- C. Rebuild mock-up or non-conforming work within mock-up to meet intent of all specified components at the direction of the Architect.
- D. Mock up will be used as the standard of quality for all masonry installation on the project.
- E. All work shall conform to the specifications and quality established in the mock-up panel.
- F. Mock-up may not remain as part of the finished work.

1.7 PRE-INSTALLATION MEETING

- A. Convene minimum one week before starting work of this section.
- B. Construct Mock-up wall prior to pre-installation meeting.
- C. Attendance:
 - 1. Contractor
 - 2. Mason contractor.
 - 3. Mason foreman.
 - 4. Architect.

1.8 DELIVERY, STORAGE, AND HANDLING

- A. Deliver, handle, and store masonry units by means that will prevent mechanical damage and contamination by other materials.
- B. Handle and store ceramic glazed masonry units and pre-faced concrete block units in protective cartons or trays. Do not remove from protective packaging until ready for installation.
- C. Stack masonry units, anchors, ties and miscellaneous accessories on wood pallets or blocking above ground and protect from exposure to weather at all times.
- D. Cover brick, all masonry units and all reinforcing and accessories with covers that permit air circulation and prevent moisture infiltration.
- E. Any materials not protected at all times will be marked rejected and shall be removed from the site by the contractor within 24 hours. All transportation and replacement costs and delays in the schedule will be the sole responsibility of the contractor and at no additional cost to the owner.
- F. Clean all materials of dirt, mud, ice, rust, or other foreign substances immediately prior to using.

1.9 ENVIRONMENTAL REQUIREMENTS

- A. Cold Weather Requirements: Comply with ACI 530.1.
- B. Maintain materials and surrounding air temperature to minimum 40 degrees F prior to, during, and 48 hours after completion of masonry work.
- C. Do not build on frozen work.
- D. Remove and replace all masonry work damaged by freezing.
- E. Hot Weather Requirements: Comply with ACI 530.1.
- F. Maintain materials and surrounding air temperature to maximum 90 degrees F prior to, during, and 48 hours after completion of masonry work.

1.10 EXTRA MATERIALS

- A. See Section 01600 - Product Requirements, for additional provisions.
- B. Provide 50 of each size, color, and type of glazed units for Owner's use in maintenance of project.

PART 2 – PRODUCTS

2.1 CONCRETE MASONRY UNITS

- A. Acceptable Manufacturers:
 - 1. Best Block Co.; www.bestblock.net.
 - 2. Chicago Block and Brick; www.chicagoblock.com
 - 3. Northfield Block; www.northfieldblock.com

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4. Trenwyth Industries; www.trenwyth.com
5. Valley Block & Supply Co., Inc., Elgin, IL 60123.
- B. Shapes: Provide shapes indicated and as follows, with exposed surfaces matching exposed faces of adjacent units unless otherwise indicated.
 1. Provide special shapes for lintels, corners, jambs, sashes, movement joints, headers, bonding, and other special conditions.
 2. Provide bullnose units for outside corners unless otherwise indicated.
- C. Integral Water Repellent: Provide units made with integral water repellent for weather exposed units at Dumpster Walls.
 1. Integral Water Repellent: Liquid polymeric, integral water-repellent admixture that does not reduce flexural bond strength. Units made with integral water repellent, when tested according to ASTM E 514 as a wall assembly made with mortar containing integral water-repellent manufacturer's mortar additive, with test period extended to 24 hours, shall show no visible water or leaks on the back of test specimen.
 2. Products: Subject to compliance with requirements, provide one of the following:
 - a. ACM Chemistries; RainBloc.
 - b. BASF Aktiengesellschaft; Rheopel Plus.
 - c. Grace Construction Products, W. R. Grace & Co. - Conn.; Dry-Block.
- D. Load Bearing Concrete Masonry units: Comply with referenced standards and as follows:
 1. Size: Unless otherwise noted provide standard units with nominal face dimensions of 16 x 8 inches and nominal depths as indicated on the drawings for specific locations.
 2. Load-Bearing Units: ASTM C 90, medium weight.
 - a. Hollow block with nominal 1 3/8 inches shell thickness unless indicated otherwise on contract drawings.
 - b. Exposed faces: Manufacturer's standard color and texture where indicated.
- E. Non-Load Bearing Units: Comply with referenced standards and as follows:
 1. Hollow block, as indicated unless otherwise noted.
 2. Size: Unless otherwise noted provide standard units with nominal face dimensions of 16 x 8 inches and nominal depths as indicated on the drawings for specific locations.
 3. Load-Bearing Units: ASTM C 129, medium weight.
 - a. Hollow block with nominal 1 3/8 inches shell thickness unless indicated otherwise on contract drawings.
 - b. Exposed faces: Manufacturer's standard color and texture where indicated.

2.2 BRICK UNITS

- A. Manufacturers:
 1. Basis of Design: Interstate Brick
- B. Substitutions: See Section 01600 - Product Requirements.
- C. General: Provide shapes indicated and as follows, with exposed surfaces matching finish and color of exposed faces of adjacent units:
 1. For ends of sills and caps and for similar applications that would otherwise expose unfinished brick surfaces, provide units without cores or frogs and with exposed surfaces finished
 2. Provide special shapes for applications where stretcher units cannot accommodate special conditions, including those at corners, movement joints, bond beams, sashes, and lintels.
 3. Provide special shapes for applications requiring brick of size, form, color, and texture on exposed surfaces that cannot be produced by sawing.
 4. Provide special shapes for applications where shapes produced by sawing would result in sawed surfaces being exposed to view.
- D. Facing Brick: ASTM C 216, Type FBS, Grade SW.
 1. All face brick will provided under an allowance: Refer to Section 01210 Allowances.
 2. Efflorescence: Provide brick that has been tested according to ASTM C 67 and is rated "not effloresced."

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3. Color and texture:
 - a. Type 1: Mountain Red, Matte
 - b. Type 2: Cedar, Matte
 - c. Type 3: Midnight Black, Matte
4. Modular Size (Actual Dimensions): 3-5/8 inches wide by 2-1/4 inches high by 7-5/8 inches long.
5. Compressive strength: As indicated on drawings, measured in accordance with ASTM C 67.

2.3 MORTAR AND GROUT MATERIALS

- A. Mortar and grout: As specified in Section 04065.

2.4 REINFORCEMENT AND ANCHORAGE

- A. Manufacturers of Joint Reinforcement and Anchors:
 1. Dur-O-Wal: www.dur-o-wal.com.
 2. Heckmann Building Products, Inc: www.heckmannbuildingprods.com.
 3. Hohmann & Barnard, Inc: www.h-b.com.
 4. Masonry Reinforcing Corporation of America: www.wirebond.com.
 5. Substitutions: See Section 01600 - Product Requirements.
- B. Reinforcing Steel: ASTM A 615/A 615M Grade 60 deformed billet bars.
- C. Vertical Structural Reinforcing Steel: type as specified in Section 03200; size as indicated on drawings; uncoated finish.
- D. Interior Single Wythe Joint Reinforcement: Contractor option of Truss or ladder type; ASTM A 82 steel wire, mill galvanized to ASTM A 641/A 641M, Class 3; 0.1483 inch side rods with 0.1483 inch cross rods; width as required to provide not more than 1 inch and not less than 1/2 inch of mortar coverage on each exposure.
- E. Exterior Single Wythe Joint Reinforcement: Ladder type; ASTM A 82 steel wire, hot dip galvanized after fabrication to ASTM A 153/A 153M, Class B; 0.1483 inch side rods with 0.1483 inch cross rods; width as required to provide not more than 1 inch and not less than 1/2 inch of mortar coverage on each exposure.
- F. Interior Multiple Wythe Joint Reinforcement: 3 Wire Ladder or truss type; spaced 16 inches on center vertically ASTM A 82 steel wire, mill galvanized to ASTM A 641/A 641M, Class 3; 0.1483 inch side rods minimum with 0.1483 inch cross rods and pintles; width as required to provide not more than 1 inch and not less than 1/2 inch of mortar coverage on each exposure.
- G. Exterior Multiple Wythe Joint Reinforcement: 3 Wire Ladder type; spaced 16 inches on center vertically ASTM A 82 steel wire, hot dip galvanized after fabrication to ASTM A 153/153M, Class B; 0.1483 inch side rods minimum with 0.1483 inch cross rods and pintles; width as required to provide not more than 1 inch and not less than 1/2 inch of mortar coverage on each exposure.
- H. Exterior Adjustable Multiple Wythe Joint Reinforcement: Ladder type with adjustable ties or tabs spaced at 16 in on center ASTM A 82 steel wire, hot dip galvanized after fabrication to ASTM A 153/153M, Class B; 0.1483 inch side rods with 0.1483 inch cross rods and adjustable components of 0.1875 inch wire in compliance with ACI 530; width of components as required to provide not more than 1 inch and not less than 1/2 inch of mortar coverage from each masonry face.
 1. Vertical adjustment: Not more than 2 inches.
 2. Insulation Clips: Provide clips at tabs or ties designed to secure insulation against outer face of inner wythe of masonry.
- I. Exterior Cavity Wall Multiple Wythe reinforcement: Contractor choice of Exterior Multiple Wythe joint reinforcing or Exterior Adjustable Multiple Wythe Joint Reinforcing placed at 16 inches on center and in compliance with ACI 530.1. Where a two piece (eye and pintle) adjustable system is used in the backup wythe, an additional ladder reinforcement is to be added to the face wythe one course above or below the 2 piece system and at 16 inches on center vertically and conforming to the characteristics of single wythe reinforcing.

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- J. Flexible Anchors: 2-piece anchors that permit differential movement between masonry and building frame, sized to provide not more than 1 inch and not less than 1/2 inch of mortar coverage from masonry face.
 - 1. Concrete frame: Dovetail anchors of bent steel strap, nominal 1 inch width x 0.06 inch thick, with trapezoidal wire ties 0.1875 inch thick, hot dip galvanized to ASTM A 153/A 153M, Class B.
 - 2. Steel frame: Crimped wire anchors for welding to frame, minimum 0.25 inch thick, with triangular wire ties 0.1875 inch thick, hot dip galvanized to ASTM A 153/A 153M, Class B.
- K. Wall Ties: Corrugated formed sheet metal, minimum 7/8 inches x 7 inches x 0.065 inches thick, adjustable hot dip galvanized to ASTM A 153/A 153M, Class B.
- L. Masonry Veneer Anchors: 2-piece anchors that permit differential movement between masonry veneer and structural backup, hot dip galvanized to ASTM A 153/A 153M, Class B.
 - 1. Anchor plates: Not less than 0.075 inch thick, designed for fastening to structural backup through sheathing by two fasteners; provide design with legs that penetrate sheathing and insulation to provide positive anchorage.
 - 2. Wire ties: Triangular shape, 0.1875 inch thick.
 - 3. Vertical adjustment: Not less than 3-1/2 inches.
- M. Additional Anchors for Masonry to Structural Steel.
 - 1. Vertical wide flange column - Flanges parallel to wall:
 - a. STRAP-TYPE COLUMN & WALL ANCHOR with CORRUGATED COLUMN ANCHOR WALL TIE: 1/8 inch x 7 inches long x 2 inches wide x 1-1/2 inch fold back with a 5/8 inch wide x 1 inch deep slot starting 1 inch from end. Wall tie 22 gage x 1 inch (25.4 mm) wide x 24 inches (610 mm) long. All components hot dip galvanized to ASTM A 153/A 153M, Class B-2.
 - 2. Vertical wide flange column - Flanges perpendicular to wall:
 - a. TWISTED L-TYPE COLUMN & WALL ANCHOR (left and right) and 190-WT CORRUGATED COLUMN ANCHOR WALL TIE 1/8 inch x 1-1/4 inch wide x length with a 1-1/2 inch fold back with a twist to start length from inside of hook. Wall tie 22 gage x 1 inch wide x 24 inches long. All components shall be hot dip galvanized to ASTM A 153/A 153M, Class B-2.

2.5 FLASHINGS

- A. Metal Flashing and receivers: As specified in Section 07620.
- B. Flexible Flashing and accessories:
 - 1. Acceptable Products and Manufacturers (Obtain all flashing materials and accessories from a single manufacturer):
 - a. Illinois Products Corp: IPCO Flashing; www.illinoisproducts.com.
 - b. Dur-O-Wal, Inc.: Dur-O-Barrier-44 Wall Flashing; www.dur-o-wal.com.
 - c. Grace Construction Products: Perm-A-Barrier Wall Flashing; www.na.graceconstruction.com
 - d. Hyload Inc.; www.hyload.com
 - e. Substitutions not permitted.
 - 2. Wall Flashing: Consisting of minimum 26 mils of self-adhering rubberized asphalt waterproofing laminated to a 4 mil high density, cross-laminated polyethylene film. Provide a release paper to protect rubberized asphalt surface prior to installation.
 - 3. Flashing End Dams: Preformed unit consisting of minimum 36 mils of self-adhering rubberized asphalt waterproofing laminated to a 4-mil high density, cross-laminated polyethylene film with 8-inch high legs (16 inch high legs if mortar net is used). Provide a release paper to protect rubberized asphalt surface prior to installation.
 - 4. Inside and Outside Flashing Corners: Preformed unit consisting of minimum 36 mils of self-adhering rubberized asphalt waterproofing laminated to a 4-mil high density, cross laminated polyethylene film with 8-inch high legs (16 inch high legs if mortar net is used). Provide a release paper to protect rubberized asphalt prior to installation.

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5. Level Change: Preformed unit consisting of minimum 36 mils of self-adhering rubberized asphalt waterproofing laminated to a 4-mil high density, cross laminated polyethylene film with 8-inch high legs (16 inch high legs if mortar net is used). Provide a release paper to protect rubberized asphalt prior to installation.
6. Flashing Primer / Substrate cleaner: Liquid; brush or roller applied; by same manufacturer as flashing.
7. Metal Drip Edge: 2-inch wide x 0.015-inch thick stainless steel strip with preformed drip and hemmed edge (1/4-inch drip at 45 degree angle) for all supported conditions.
8. Metal Drip edge preformed corners for 2-inch wide drip: same material as drip edge and as provided by drip edge manufacturer.
9. Metal Drip Edge: 6-inch wide x 0.015-inch thick stainless steel strip with preformed drip and hemmed edge (1/4-inch drip at 45 degree angle) for wherever flashing is unsupported across air space.
10. Metal Drip edge preformed corners for 6-inch wide drip: same material as drip edge and as provided by drip edge manufacturer.
11. Sealant for bedding drip edge: One component gun grade polyurethane sealant as specified in 07900.
12. Sealant for flashing edges corners and seams: mastic sealant as recommended by flashing Manufacturer and Compatible with flashing material.
13. Termination Bar 1/8 inches x 1 inch stainless steel with sealant ledge and predrilled pilot holes at 12 inches o.c
 - a. Expansion anchors for termination bar: Material compatible with termination bar that will not cause galvanic action.

2.6 BOARD INSULATION

- A. Rigid Insulation for Cavity Walls: As specified in Section 07212.

2.7 ACCESSORIES

- A. Rigid insulation adhesive: as specified in section 07212.
- B. Preformed Control Joints: Polyvinyl chloride material meeting ASTM D 2287 with a durometer hardness minimum of 80 when tested in conformance with ASTM D-2240. Provide with corner and tee accessories, fused joints.
 1. Manufacturers:
 - a. Illinois Products Corp.; www.illinoisproducts.com.
 - b. Dur-O-Wal Inc.; www.dur-o-wal.com.
 - c. Heckmann Building Products, Inc; www.heckmannbuildingprods.com.
 - d. Hohmann & Barnard, Inc; www.h-b.com.
 - e. Substitutions: See Section 01600 - Product Requirements.
- C. Frame installation contractor to provide bitumastic coating for all exterior door frames for the entire length of the frame prior to frame installation.
- D. Joint Filler: Closed cell polyvinyl chloride; meeting ASTM D 1667 Type VE-41; oversized 50 percent to joint width; self expanding; 3 and 6 inch wide x maximum lengths available.
 1. Manufacturers:
 - a. Illinois Products Corp.; www.illinoisproducts.com.
 - b. Dur-O-Wal Inc.; www.dur-o-wal.com.
 - c. Heckmann Building Products, Inc; www.heckmannbuildingprods.com.
 - d. Hohmann & Barnard, Inc; www.h-b.com.
 - e. Substitutions: See Section 01600 - Product Requirements.
- E. Weep/Cavity/Cell Vents: Molded PVC grilles, insect resistant.
 1. Manufacturers:
 - a. Illinois Products Corp.; www.illinoisproducts.com.
 - b. Dur-O-Wal Inc.; www.dur-o-wal.com.
 - c. Heckmann Building Products, Inc; www.heckmannbuildingprods.com.
 - d. Hohmann & Barnard, Inc; www.h-b.com.
 - e. Substitutions: See Section 01600 - Product Requirements.

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- F. Cavity Drip/Insulation Retaining Ring: Molded PVC grilles, insect resistant. PVC clip-type retainer for rigid board insulation; attaches to loop wires on horizontal joint reinforcement
 - 1. Manufacturers:
 - a. Illinois Products Corp.; www.illinoisproducts.com.
 - b. Dur-O-Wal Inc.;www.dur-o-wal.com.
 - c. Heckmann Building Products, Inc; www.heckmannbuildingprods.com.
 - d. Hohmann & Barnard, Inc; www.h-b.com.
 - e. Substitutions: See Section 01600 - Product Requirements.
- G. Cleaning Solution: Non-acidic, not harmful to masonry work or adjacent materials.
- H. Beam and Column Isolation Wrap: Contractor choice of closed cell Expanded Polyethylene, closed cell Neoprene or closed cell PVC. Minimum of ½ inch thick, continuous wrap provided in largest sheets available.
 - 1. Expanded Polyethylene:
 - a. Structure: Closed cell
 - b. Density: 1.5
 - c. Compression Deflection (Force to compress 75% of original) (PSI at 25%): 6
 - d. Water Absorption (% by Volume): 0.5
 - e. Applicable Standard: ASTM D 1056 / D 624 / C 272
 - 2. Neoprene:
 - a. Structure: Closed cell
 - b. Density: 8 to 12
 - c. Compression Deflection (Force to compress 75% of original)(PSI at 25%):2-5
 - d. Applicable Standard: ASTM D 1056
 - 3. PVC:
 - a. Structure: Closed cell
 - b. Density: 3 to 5
 - c. Compression Deflection (Force to compress 75% of original)(PSI at 25%): 12.5
 - d. Applicable Standard: ASTM D 1667

PART 3 – EXECUTION

3.1 EXAMINATION

- A. Verify that field conditions are acceptable and are ready to receive masonry.
- B. Verify that related items provided under other sections are properly sized and located.
- C. Verify that built-in items are in proper location, and ready for roughing into masonry work.

3.2 PREPARATION

- A. Wetting of Brick: Wet brick prior to laying if the initial rate of absorption exceeds 30 g/30 sq. in. (g/194 sq. cm) per minute when tested per ASTM C 67. Allow units to absorb the water so they are damp but not wet at the time of laying.
- B. Determine any adjustments in mortar mix to accommodate brick absorption and weather conditions necessary to produce appropriate bond to brick and to insure water-resistive wall construction.
- C. Install and coordinate placement of metal anchors supplied for securing materials of other sections type, size, finish and spacing as indicated in the drawings and as required by ACI 530.
- D. Determine requirements for temporary bracing of walls which require bracing during installation of masonry work. Maintain in place until building structure provides permanent bracing.
- E. Consult and coordinate masonry work with other crafts to avoid future cutting and patching.
- F. Provide column isolation wrap at all intersections of steel and masonry unless otherwise noted.

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3.3 COURSING

- A. Establish lines, levels, and coursing indicated. Protect from displacement.
- B. Maintain masonry courses to uniform dimension. Form vertical and horizontal joints of uniform thickness.
- C. Concrete Masonry Units:
 - 1. Bond: Running.
 - 2. Coursing: One unit and one mortar joint to equal 8 inches.
 - 3. Mortar Joints: Concave at all locations unless otherwise noted.
- D. Brick Units:
 - 1. Bond: Running.
 - 2. Coursing: Three units and three mortar joints to equal 8 inches for standard and modular size brick.
 - 3. Mortar Joints: Concave.

3.4 PLACING AND BONDING

- A. Lay solid masonry units in full bed of mortar, with full head joints, uniformly jointed with other work.
- B. Provide cleanouts minimum 8 inches long and 1 brick high, 24 inches on center in the course immediately above any flashing.
- C. Lay hollow masonry units with full face shell bedding on head and bed joints.
- D. Lay first course of all masonry above steel and concrete surfaces in full bed of mortar.
- E. Lay all concrete masonry units dry.
- F. Buttering corners of joints or excessive furrowing of mortar joints is not permitted.
- G. Remove excess mortar as work progresses.
- H. Interlock intersections and external corners, except for units laid in stack bond.
- I. Do not shift or tap masonry units after mortar has achieved initial set. Where adjustment must be made, remove mortar and replace.
- J. Do not use broken, chipped or cracked units where exposed to view.
- K. Where necessary to stop off a horizontal run of masonry, rack back one-half block length or one half brick length in each course. Tothing is not permitted.
- L. Where fresh masonry joints partially or totally set masonry, clean exposed surface of set material and remove loose mortar and foreign material prior to laying fresh masonry.
- M. Perform job site cutting of masonry units with proper tools to provide straight, clean, unchipped edges. Prevent broken masonry unit corners or edges.
- N. Fill mortar joints flush where wall tile or resilient base is scheduled. All other joints shall be tooled as scheduled above in coursing.
- O. Isolate interior masonry partitions from vertical structural framing members and exterior walls with open one-half inch joint with joint filler. Maintain continuous joint reinforcement through installation.
- P. Isolate masonry partitions from vertical structural framing members with a control joint.
- Q. Isolate top joint of masonry partitions from horizontal structural framing members and slabs or decks with compressible filler.
- R. Extend and anchor all masonry walls to underside of floors, beams or roof structure, unless otherwise indicated.
- S. Brick up solid wherever beams bear on masonry, except where otherwise indicated.
- T. Provide soft joints at all dissimilar materials. Rake back mortar at dissimilar materials to provide sufficient width to depth ratio for soft joint. Provide backer rod or bond breaker tape and sealant as specified in Section 07900 - Joint Sealers

3.5 CLEANOUTS

- A. Provide cleanouts in exterior masonry wythes in every course immediately above through wall flashings.
 - 1. Cleanouts are to occur every third brick horizontally for exterior brick wythes.
 - 2. Cleanouts are to occur every second block horizontally for exterior CMU wythes.

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UNIT MASONRY ASSEMBLIES

3.6 WEEPS (CELL VENTS)

- A. Install weeps in cavity walls at 24 inches on center horizontally immediately above through-wall flashings for brick.
- B. Install weeps in cavity walls at 32 inches on center horizontally immediately above through-wall flashings for CMU.
- C. Install cell vents at head joints per manufacturer recommendations.

3.7 CAVITY WALL

- A. Do not permit mortar to accumulate in cavity, at lintel locations, or at the bottom of cavity air space.
 - 1. Maintain cavity free from mortar droppings and other obstructions by utilizing one of the following:
 - a. Provide daily monitoring of cleanouts and remove excess material to eliminate mortar dropping buildup.
 - b. Provide pull up board in cavity to prevent mortar droppings in cavity when workmanship alone does not prevent mortar droppings.
 - c. Provide cavity drainage board complying with no interior water intrusion when tested in accordance with ASTM E514.
- B. Build inner wythe ahead of outer wythe to receive cavity insulation and air/vapor barrier materials.
- C. Install rigid insulation in accordance with Section 07212.
 - 1. Assure continuous positive bonding with backup wall. Do not allow insulation to reduce cavity space.
- D. Fill in cleanouts and install weeps at brick and/or CMU units at cleanout locations when approved by Architect. Mortar color shall match surrounding units to the satisfaction of the Architect. Repoint as required to obtain proper color.

3.8 REINFORCEMENT AND ANCHORAGE – GENERAL

- A. Unless otherwise indicated on drawings or specified under specific wall type, install horizontal joint reinforcement 16 inches on center.
- B. Place masonry joint reinforcement in first and second horizontal joints above and below openings. Extend minimum 16 inches each side of opening.
- C. Place continuous joint reinforcement in first and second joint below top of walls.
- D. Lap joint reinforcement ends minimum 6 inches.
- E. Reinforce stack bonded unit joint corners and intersections with strap anchors 16 inches on center.
- F. For exterior multiple wythe systems, reinforce stack bonded brick and concrete masonry units of any configuration with an additional layer of horizontal reinforcing within the outer wythe. Install at 16 inches on center vertically and alternate with cross wythe reinforcing.
- G. Fasten anchors to structural framing and embed in masonry joints as masonry is laid. Unless otherwise indicated on drawings or closer spacing is indicated under specific wall type, space anchors at maximum of 36 inches horizontally and 24 inches vertically.

3.9 REINFORCEMENT AND ANCHORAGE - SINGLE WYTHER MASONRY

- A. Install horizontal joint reinforcement 16 inches on center.
- B. Place masonry joint reinforcement in first and second horizontal joints above and below openings. Extend minimum 16 inches each side of opening.
- C. Place continuous joint reinforcement in first and second joint below top of walls.
- D. Lap joint reinforcement ends minimum 6 inches.
- E. Do not continue horizontal joint reinforcement through control and expansion joints.
- F. Reinforce stack bonded unit joint corners and intersections with strap anchors 16 inches on center.
- G. Secure wall to decking above as shown on drawings to guard against lateral movement.

SECTION 04810

UNIT MASONRY ASSEMBLIES

3.10 REINFORCEMENT AND ANCHORAGES - CAVITY WALL MASONRY

- A. Install horizontal joint reinforcement 16 inches on center.
- B. Place masonry joint reinforcement in first and second horizontal joints above openings and the second horizontal joint below openings unless otherwise indicated on drawings. Extend minimum 16 inches each side of openings.
- C. Place continuous joint reinforcement in first and second joint below top of walls.
- D. All masonry wythes are to have continuous horizontal joint reinforcing at 16 inches on center vertically. Where a two piece (eye and pintle) system is used in the backup wythe an additional ladder reinforcement is to be added to the face wythe one course above or below the 2 piece system 16 inches on center vertically.
- E. For exterior multiple wythe systems, reinforce stack bonded brick and concrete masonry units of any configuration with an additional layer of horizontal reinforcing within the outer wythe. Install at 16 inches on center vertically and alternate with cross wythe reinforcing.
- F. Provide continuity at corners and wall intersections by using prefabricated "L" and "T" sections. Cut and bend reinforcement units as directed by the manufacturer for continuity at returns, offsets, column fireproofing, pipe enclosures and other similar special conditions where continuity of reinforcement is interrupted.
- G. Lap joint reinforcement ends minimum 6 inches.
- H. Do not continue horizontal joint reinforcement through control and expansion joints.
- I. Fasten anchors to structural framing and embed in masonry joints as masonry is laid. Space anchors at maximum of 24 inches horizontally and 24 inches vertically.
- J. Reinforce stack bonded unit joint corners and intersections with strap anchors 16 inches on center.
- K. Provide adjustable wall ties for exterior masonry over steel stud framing, corrugated wall ties are not permitted.
- L. Fasten anchors to structural framing and embed in masonry joints as masonry is laid. Unless otherwise indicated on drawings or closer spacing is indicated under specific wall type, space anchors at maximum of 24 inches horizontally and 24 inches vertically.
- M. Masonry Back-Up: Embed anchors in masonry back-up to bond veneer at maximum 1.77 sq ft of wall surface per anchor. Place additional anchors at perimeter of openings and ends of panels, so maximum spacing of anchors is 16 on center.
- N. Stud back-Up: Secure adjustable veneer anchors to stud framed back-up and embed into masonry veneer at maximum 1.77 sq ft of wall surface per anchor. Place additional anchors at perimeter of openings and ends of panels, so maximum spacing of anchors is 16 on center.
- O. Reinforce concrete masonry units of walls and partitions with deformed steel bars as indicated on the drawings.
- P. Support and secure reinforcing bars from displacement. Maintain position within tolerances specified by ACI 530.1.
- Q. Lap reinforcing bars splices minimum 48 bar diameters.

3.11 REINFORCEMENT AND ANCHORAGES – MULTIPLE WYTHE UNIT MASONRY

- A. Install horizontal joint reinforcement 16 inches on center.
- B. Place masonry joint reinforcement in first and second horizontal joints above and below openings. Extend minimum 16 inches each side of opening.
- C. Place continuous joint reinforcement in first and second joint below top of walls.
- D. Lap joint reinforcement ends minimum 6 inches.
- E. Fasten anchors to structural framing and embed in masonry joints as masonry is laid. Space anchors at maximum of 24 inches horizontally and 24 inches vertically.
- F. Reinforce stack bonded unit joint corners and intersections with strap anchors 16 inches on center.

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UNIT MASONRY ASSEMBLIES

3.12 MASONRY FLASHINGS

- A. Whether or not specifically indicated, install masonry flashing to divert water to exterior at all locations where downward flow of water will be interrupted.
1. Extend flashings full width at such interruptions and at least 4 inches into adjacent masonry and turn up at least 8 inches to form watertight pan at non-masonry construction. Turn flashing up 16 inches where mortar net is used.
 2. Provide prefabricated end dams at the extremities of all flashings at, above and below all openings except at changes in foundation or brick ledge level.
 3. Provide prefabricated flashing corners and elevation changes at all corners and changes in elevation where flashing is shown or required by this Specification.
 4. Provide stainless steel drip edge for all flashing and extend 1/4-inch beyond the vertical face of the masonry and lap 2 inches at flashing joints. Crimp or hem all exposed edges of drip edge to eliminate sharp edge prior to installation.
 5. Install all rigid flashing receivers as specified in Section 07620.
 6. Remove or cover protrusions or sharp edges that could puncture flashings.
- B. Installation of Flexible Flashing:
1. Extend flashing a minimum of 8 inches vertically and return into mortar joint for full width of face shell.
 2. Clean surface of the wall which is to receive the adhesive side of the flexible flashing material. Maintain surface free of dust, dirt, protrusions, and all foreign materials that would impair the bonding of the flexible flashing to the masonry. Allow surface of the wall to dry. Apply the specified flashing primer to all contact surfaces to receive wall flashing. Ensure that flashing material adheres directly to the surface of the wall and the drip edge and is free of void pockets.
 3. Install metal drip edge with a gun-grade sealant on the edges of the masonry foundation wall or structural steel. Extend the bent portion of the drip 1/4-inch beyond the face of the masonry. Maintain straight even length projections.
 4. Install flashing boots and end dams by removing the release paper and setting the items in place. Field trim ends as required to work with face wythe materials.
 5. Install the flashing over the metal drip edge and recess 1/4-inch from the vertical face of the masonry wall. Overlap the flashing segments and any flashing boots and end dams a minimum of 4 inches and install in a manner to direct the flow of water to the exterior and weepholes. Place a bead of sealant along the edge of all overlaps.
 6. Do not apply flexible flashing materials when the ambient temperature is below 25 degrees F. Do not allow flexible flashing materials to be exposed to direct sunlight for more than 30 days.
 7. Provide wide drip edge flashing wherever membrane flashing is unsupported across air space.
 8. Where counter-flashing receiver is required per drawings, install material provided by others.
 9. Provide termination bar with continuous sealant cap wherever top of flashing is not anchored in mortar joint. Provide a bead of sealant along the underside top edge of the flashing to ensure it does not start to peel away from the backup wall.
 10. Protect flashing from UV exposure: Provide Manufacturer approved protection for all flashing that may be exposed to UV radiation for a period of 30 days or more. For materials that have been exposed to UV radiation for more than 30 days, provide Manufacturer's written inspection report and approval that the materials in place will perform as intended. All materials not passing this inspection shall be removed and replaced at no additional cost to the Owner.
 11. Seal lapped ends and penetrations of flashing a minimum of 6 inches and seal watertight with mastic before covering with mortar.
 12. Extend flexible flashings to within 1/4 inch of exterior face of masonry

SECTION 04810

UNIT MASONRY ASSEMBLIES

3.13 LINTELS

- A. Install loose steel lintels over openings.
 - 1. Connect lintel to bearing plate where indicated.
 - 2. Build masonry tight to all encased surfaces of lintels.
- B. Install reinforced unit masonry lintels over openings where steel or pre-cast concrete lintels are not scheduled.
 - 1. Openings to 42 inches: Place two, No. 5 reinforcing bars 1 inch from bottom web.
 - 2. Do not splice reinforcing bars.
 - 3. Allow masonry lintels to attain specified strength before removing temporary supports.
- C. Maintain minimum 8 inch bearing on each side of opening.

3.14 GROUTED COMPONENTS

- A. Reinforce bond beams with 2, No. 5 bars, 1 inch from bottom web, unless indicated otherwise.
- B. Lap splices minimum 48 bar diameters. No lap splices are permitted in bond beams over masonry openings.
- C. Support and secure reinforcing bars from displacement. Maintain position within 1/2 inch of dimensioned position.
- D. Place and consolidate grout fill without displacing reinforcing.
- E. At bearing locations, fill masonry cores with grout for a minimum 2 courses below and 24 inches horizontally for lintels and 3 courses below and 24 inches horizontally for beams unless noted otherwise on drawings.

3.15 CONTROL AND EXPANSION JOINTS

- A. Do not continue horizontal joint reinforcement through control and expansion joints.
- B. Form all Control Joints with Jamb blocks.
- C. Install preformed control joint device in continuous lengths. Seal butt and corner joints in accordance with manufacturer's instructions.
- D. Control joints shall align with wall discontinuities such as window and door jambs.
- E. Size control joint in accordance with Section 07900 for sealant performance.
- F. Control and Expansion joints are to be spaced no more than 20 feet apart; and must be within 2 feet of one side of exterior building corners; AS INDICATED ON DRAWINGS. In the absence of indications on drawings, the Contractor shall contact the Architect in writing for direction as to where to place the joints prior to proceeding with the work of this section. Any masonry engaged by the contractor without such notification shall be repaired by the Contractor at no cost to the Owner and as directed by the Architect.

3.16 BUILT-IN WORK

- A. As work progresses, install built-in metal door frames, glazed frames, window frames, and anchor bolts and other items to be built into the work and furnished under other sections. Frame installing contractor shall coat inside of frames to be installed in masonry or to be grouted, with bituminous coating prior to installation as noted. Apply wet to 18.0 mils (450 microns) in one or two coats. Total dry film thickness of not less than 12 mils (300 microns) or in excess of 30 mils.
- B. Install built-in items plumb, level, and true to line.
- C. Bed anchors of metal door and glazed frames in adjacent mortar joints. Fill frame jamb voids solid with grout.
 - 1. Fill adjacent masonry cores with grout minimum 12 inches from framed openings.
- D. Grout all spaces around built-in items solid
- E. Do not build into masonry construction organic materials that are subject to deterioration.

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UNIT MASONRY ASSEMBLIES

3.17 TOLERANCES

- A. Construct unit masonry assemblies in strict accordance with ACI 530.1, but not less than tolerances below.
- B. Maximum Variation From Unit to Adjacent Unit: 1/16 inch.
- C. Maximum Variation from Plane of Wall: 1/4 inch in 10 ft and 1/2 inch in 20 ft or more.
- D. Maximum Variation from Plumb: 1/4 inch per story non-cumulative; 1/2 inch in two stories or more.
- E. Maximum Variation from Level Coursing: 1/8 inch in 3 ft and 1/4 inch in 10 ft; 1/2 inch in 30 ft.
- F. Maximum Variation of Joint Thickness: 1/8 inch in 3 ft.
- G. Maximum Variation from Cross Sectional Thickness of Walls: 1/4 inch.

3.18 CUTTING AND FITTING

- A. Cut and fit for chases. Coordinate with other sections of work to provide correct size, shape, and location.
- B. Obtain approval prior to cutting or fitting masonry work not indicated or where appearance or strength of masonry work may be impaired.

3.19 FIELD QUALITY CONTROL

- A. An independent testing agency will perform field quality control tests, as specified in Section 01400.

3.20 CLEANING

- A. Remove excess mortar and mortar smears as work progresses.
- B. Replace defective or discolored mortar. Match adjacent work.
- C. Clean soiled surfaces with cleaning solution.
- D. Replace chipped or broken units where exposed to view.
- E. Use non-metallic tools in cleaning operations.

3.21 PROTECTION OF FINISHED WORK

- A. Without damaging completed work, provide protective boards at exposed external corners, which are subject to damage by construction activities and maintain until substantial completion of masonry.

END OF SECTION

SECTION 05120

STRUCTURAL STEEL FRAMING

PART 1 – GENERAL

1.1 SECTION INCLUDES

- A. Structural steel
- B. Shear Connectors for composite steel joists
- C. Grout

1.2 RELATED SECTIONS

- A. Division 01 Section "Quality Requirements" for independent testing agency procedures and administrative requirements
- B. Division 05 Section "Metal Fabrications" for steel lintels and shelf angles not attached to structural-steel frame and other metal items not defined as structural steel
- C. Division 05 Section "Steel Joist Framing" for composite steel joists

1.3 PERFORMANCE REQUIREMENTS

- A. Connections: Provide details of simple shear connections required by the Contract Documents to be selected or completed by structural-steel fabricator to withstand loads indicated and comply with other information and restrictions indicated
 - 1. Select and complete connections using AISC 360.
 - 2. Use ASD; data are given at service-load level.
- B. Construction: Combined system of moment frame and shear walls

1.4 SUBMITTALS

- A. Product Data: For each type of product indicated
- B. Shop Drawings: Show fabrication of structural-steel components
 - 1. Include details of cuts, connections, splices, camber, holes, and other pertinent data.
 - 2. Include embedment drawings.
 - 3. Indicate welds by standard AWS symbols, distinguishing between shop and field welds, and show size, length, and type of each weld. Show backing bars that are to be removed and supplemental fillet welds where backing bars are to remain.
 - 4. Indicate type, size, and length of bolts, distinguishing between shop and field bolts. Identify pretensioned and slip-critical high-strength bolted connections.
- C. Welding certificates
- D. Paint Compatibility Certificates: From manufacturers of topcoats applied over shop primers, certifying that shop primers are compatible with topcoats
- E. Mill test reports for structural steel, including chemical and physical properties
- F. Product Test Reports: For the following
 - 1. Bolts, nuts, and washers including mechanical properties and chemical analysis.
 - 2. Direct-tension indicators.
 - 3. Tension-control, high-strength bolt-nut-washer assemblies.
 - 4. Shop primers.
 - 5. Nonshrink grout.
- G. Source quality-control reports

1.5 QUALITY ASSURANCE

- A. Fabricator Qualifications: A qualified fabricator with at least 5 years documented experience with projects of a similar size and complexity
- B. Installer Qualifications: A qualified installer with at least 5 years documented experience with projects of a similar size and complexity
- C. Welding Qualifications: Qualify procedures and personnel according to AWS D1.1/D1.1M, "Structural Welding Code - Steel"
- D. Comply with applicable provisions of the following specifications and documents
 - 1. AISC 303.
 - 2. AISC 360.
 - 3. RCSC's "Specification for Structural Joints Using High Strength Bolts."

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STRUCTURAL STEEL FRAMING

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Store materials to permit easy access for inspection and identification. Keep steel members off ground and spaced by using pallets, dunnage, or other supports and spacers. Protect steel members and packaged materials from corrosion and deterioration
 - 1. Do not store materials on structure in a manner that might cause distortion, damage, or overload to members or supporting structures. Repair or replace damaged materials or structures as directed.
- B. Store fasteners in a protected place in sealed containers with manufacturer's labels intact
 - 1. Fasteners may be repackaged provided Owner's testing and inspecting agency observes repackaging and seals containers.
 - 2. Clean and relubricate bolts and nuts that become dry or rusty before use.
 - 3. Comply with manufacturers' written recommendations for cleaning and lubricating ASTM F 1852 fasteners and for retesting fasteners after lubrication.

1.7 COORDINATION

- A. Coordinate selection of shop primers with topcoats to be applied over them. Comply with paint and coating manufacturers' recommendations to ensure that shop primers and topcoats are compatible with one another
- B. Coordinate installation of anchorage items to be embedded in or attached to other construction without delaying the Work. Provide setting diagrams, sheet metal templates, instructions, and directions for installation

PART 2 – PRODUCTS

2.1 STRUCTURAL-STEEL MATERIALS

- A. W-Shapes: ASTM A 992/A 992M
- B. Channels, Angles: ASTM A 36/A 36M
- C. Plate and Bar: ASTM A 36/A 36M
- D. Hollow Structural Sections: ASTM A 500, Grade B, structural tubing
- E. Steel Pipe: ASTM A 53/A 53M, Type E or S, Grade B
 - 1. Weight Class: As indicated.
 - 2. Finish: Black.
- F. Welding Electrodes: Comply with AWS requirements

2.2 BOLTS, CONNECTORS, AND ANCHORS

- A. High-Strength Bolts, Nuts, and Washers: ASTM F3125, GR A325, Type 1, heavy-hex steel structural bolts; ASTM A 563, Grade C, heavy-hex carbon-steel nuts; and ASTM F 436, Type 1, hardened carbon-steel washers; all with plain finish
- B. Tension-Control, High-Strength Bolt-Nut-Washer Assemblies: ASTM F3125, Grade F 1852, Type 1, round head assemblies consisting of steel structural bolts with splined ends, heavy-hex carbon-steel nuts, and hardened carbon-steel washers.
- C. Shear Connectors: ASTM A 108, Grades 1015 through 1020, headed-stud type, cold-finished carbon steel; AWS D1.1/D1.1M, Type B.
- D. Unheaded Anchor Rods: ASTM F 1554, Grade 36
 - 1. Configuration: Straight.
 - 2. Nuts: ASTM A 563) heavy-hex carbon steel.
 - 3. Plate Washers: ASTM A 36/A 36M carbon steel.
 - 4. Washers: ASTM F 436, Type 1, hardened carbon steel.
 - 5. Finish: Plain.
- E. Threaded Rods: ASTM A 36/A 36M
 - 1. Nuts: ASTM A 563 heavy-hex carbon steel.
 - 2. Washers: A 36/A 36M carbon steel.
 - 3. Finish: Plain.

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STRUCTURAL STEEL FRAMING

2.3 PRIMER

- A. Primer: Fabricator's standard lead- and chromate-free, nonasphaltic, rust-inhibiting primer complying with MPI#79 and compatible with topcoat

2.4 GROUT

- A. Nonmetallic, Shrinkage-Resistant Grout: ASTM C 1107, factory-packaged, nonmetallic aggregate grout, noncorrosive and nonstaining, mixed with water to consistency suitable for application and a 30-minute working time

2.5 FABRICATION

- A. Structural Steel: Fabricate and assemble in shop to greatest extent possible. Fabricate according to AISC's "Code of Standard Practice for Steel Buildings and Bridges" and AISC 360
 - 1. Camber structural-steel members where indicated.
 - 2. Fabricate beams with rolling camber up.
 - 3. Identify high-strength structural steel according to ASTM A 6/A 6M and maintain markings until structural steel has been erected.
 - 4. Mark and match-mark materials for field assembly.
 - 5. Complete structural-steel assemblies, including welding of units, before starting shop-priming operations.
- B. Thermal Cutting: Perform thermal cutting by machine to greatest extent possible
 - 1. Plane thermally cut edges to be welded to comply with requirements in AWS D1.1/D1.1M.
- C. Bolt Holes: Cut, drill, or punch standard bolt holes perpendicular to metal surfaces
- D. Finishing: Accurately finish ends of columns and other members transmitting bearing loads
- E. Cleaning: Clean and prepare steel surfaces that are to remain unpainted according to SSPC-SP 2, "Hand Tool Cleaning"

2.6 SHOP CONNECTIONS

- A. High-Strength Bolts: Shop install high-strength bolts according to RCSC's "Specification for Structural Joints Using High Strength Bolts" for type of bolt and type of joint specified
 - 1. Joint Type: Snug tightened.
- B. Weld Connections: Comply with AWS D1.1/D1.1M for tolerances, appearances, welding procedure specifications, weld quality, and methods used in correcting welding work
 - 1. Assemble and weld built-up sections by methods that will maintain true alignment of axes without exceeding tolerances in AISC 303 for mill material.

2.7 SHOP PRIMING

- A. Shop prime steel surfaces except the following
 - 1. Surfaces embedded in concrete or mortar. Extend priming of partially embedded members to a depth of 2 inches (50 mm).
 - 2. Surfaces to be field welded.
 - 3. Surfaces to be high-strength bolted with slip-critical connections.
 - 4. Surfaces to receive sprayed fire-resistive materials (applied fireproofing).
- B. Surface Preparation: Clean surfaces to be painted. Remove loose rust and mill scale and spatter, slag, or flux deposits. Prepare surfaces according to the following specifications and standards
 - 1. SSPC-SP 2, "Hand Tool Cleaning."
- C. Priming: Immediately after surface preparation, apply primer according to manufacturer's written instructions and at rate recommended by SSPC to provide a minimum dry film thickness of 1.5 mils (0.038 mm). Use priming methods that result in full coverage of joints, corners, edges, and exposed surfaces
 - 1. Stripe paint corners, crevices, bolts, welds, and sharp edges.
 - 2. Apply two coats of shop paint to surfaces that are inaccessible after assembly or erection. Change color of second coat to distinguish it from first.

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STRUCTURAL STEEL FRAMING

2.8 SOURCE QUALITY CONTROL

- A. Testing Agency: Owner will engage an independent testing and inspecting agency to perform shop tests and inspections and prepare test reports
 - 1. Provide testing agency with access to places where structural-steel work is being fabricated or produced to perform tests and inspections.
- B. Correct deficiencies in Work that test reports and inspections indicate does not comply with the Contract Documents
- C. Bolted Connections: Shop-bolted connections will be inspected according to RCSC's "Specification for Structural Joints Using High Strength Bolts"
- D. Welded Connections: In addition to visual inspection, shop-welded full and partial penetration connections will be tested and inspected according to AWS D1.1/D1.1M and the following inspection procedures, at testing agency's option
 - 1. Liquid Penetrant Inspection: ASTM E 165.
 - 2. Magnetic Particle Inspection: ASTM E 709; performed on root pass and on finished weld. Cracks or zones of incomplete fusion or penetration will not be accepted.
 - 3. Ultrasonic Inspection: ASTM E 164.
 - 4. Radiographic Inspection: ASTM E 94.

PART 3 – EXECUTION

3.1 EXAMINATION

- A. Verify, with steel Erector present, elevations of concrete- and masonry-bearing surfaces and locations of anchor rods, bearing plates, and other embedments for compliance with requirements
 - 1. Prepare a certified survey of bearing surfaces, anchor rods, bearing plates, and other embedments showing dimensions, locations, angles, and elevations.
- B. Proceed with installation only after unsatisfactory conditions have been corrected

3.2 PREPARATION

- A. Provide temporary shores, guys, braces, and other supports during erection to keep structural steel secure, plumb, and in alignment against temporary construction loads and loads equal in intensity to design loads. Remove temporary supports when permanent structural steel, connections, and bracing are in place unless otherwise indicated
 - 1. Do not remove temporary shoring supporting composite deck construction until cast-in-place concrete has attained its design compressive strength.

3.3 ERECTION

- A. Set structural steel accurately in locations and to elevations indicated and according to AISC 303 and AISC 360
- B. Base Bearing and Leveling Plates: Clean concrete- and masonry-bearing surfaces of bond-reducing materials, and roughen surfaces prior to setting plates. Clean bottom surface of plates
 - 1. Set plates for structural members on wedges, shims, or setting nuts as required.
 - 2. Weld plate washers to top of baseplate.
 - 3. Snug-tighten anchor rods after supported members have been positioned and plumbed. Do not remove wedges or shims but, if protruding, cut off flush with edge of plate before packing with grout.
 - 4. Promptly pack grout solidly between bearing surfaces and plates so no voids remain. Neatly finish exposed surfaces; protect grout and allow to cure. Comply with manufacturer's written installation instructions for shrinkage-resistant grouts.
- C. Maintain erection tolerances of structural steel within AISC's "Code of Standard Practice for Steel Buildings and Bridges"

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STRUCTURAL STEEL FRAMING

- D. Align and adjust various members that form part of complete frame or structure before permanently fastening. Before assembly, clean bearing surfaces and other surfaces that will be in permanent contact with members. Perform necessary adjustments to compensate for discrepancies in elevations and alignment
 - 1. Level and plumb individual members of structure.
 - 2. Make allowances for difference between temperature at time of erection and mean temperature when structure is completed and in service.
- E. Splice members only where indicated
- F. Do not use thermal cutting during erection
- G. Do not enlarge unfair holes in members by burning or using drift pins. Ream holes that must be enlarged to admit bolts
- H. Shear Connectors: Prepare steel surfaces as recommended by manufacturer of shear connectors. Use automatic end welding of head-stud shear connectors according to AWS D1.1/D1.1M and manufacturer's written instructions.

3.4 FIELD CONNECTIONS

- A. High-Strength Bolts: Install high-strength bolts according to RCSC's "Specification for Structural Joints Using ASTM A 325 or A 490 Bolts" for type of bolt and type of joint specified
 - 1. Joint Type: Snug tightened.
- B. Weld Connections: Comply with AWS D1.1/D1.1M for tolerances, appearances, welding procedure specifications, weld quality, and methods used in correcting welding work
 - 1. Comply with AISC 303 and AISC 360 for bearing, alignment, adequacy of temporary connections, and removal of paint on surfaces adjacent to field welds.
 - 2. Rem
 - 3. Assemble and weld built-up sections by methods that will maintain true alignment of axes without exceeding tolerances in AISC's "Code of Standard Practice for Steel Buildings and Bridges" for mill material.

3.5 FIELD QUALITY CONTROL

- A. Testing Agency: Owner will engage a qualified independent testing and inspecting agency to inspect field welds and high-strength bolted connections
- B. Bolted Connections: Bolted connections will be inspected according to RCSC's "Specification for Structural Joints Using High Strength Bolts"
- C. Welded Connections: Field welds will be visually inspected according to AWS D1.1/D1.1M
 - 1. In addition to visual inspection, full and partial penetration field welds will be tested and inspected according to AWS D1.1/D1.1M and the following inspection procedures, at testing agency's option:
 - a. Liquid Penetrant Inspection: ASTM E 165.
 - b. Magnetic Particle Inspection: ASTM E 709; performed on root pass and on finished weld. Cracks or zones of incomplete fusion or penetration will not be accepted.
 - c. Ultrasonic Inspection: ASTM E 164.
 - d. Radiographic Inspection: ASTM E 94.
- D. In addition to visual inspection, test and inspect field-welded shear connectors according to requirements in AWS D1.1/D1.1M for stud welding and as follows:
 - 1. Perform bend tests if visual inspections reveal either a less-than-continuous 360-degree flash or welding repairs to any shear connector.
 - 2. Conduct test on additional shear connectors if weld fracture occurs on shear connectors already tested, according to requirements in AWS D1.1/D1.1M.
- E. Correct deficiencies in Work that test reports and inspections indicate does not comply with the Contract Documents

SECTION 05120

STRUCTURAL STEEL FRAMING

3.6 REPAIRS AND PROTECTION

- A. Touchup Painting: Immediately after erection, clean exposed areas where primer is damaged or missing and paint with the same material as used for shop painting to comply with SSPC-PA 1 for touching up shop-painted surfaces
1. Clean and prepare surfaces by SSPC-SP 2 hand-tool cleaning or SSPC-SP 3 power-tool cleaning.

END OF SECTION

SECTION 05210

STEEL JOIST FRAMING

PART 1 – GENERAL

1.1 SECTION INCLUDES

- A. K-Series joists
- B. CJ-series composite steel joists
- C. Steel bearing plates with integral anchorage

1.2 RELATED SECTIONS

- A. Division 03 Section "Cast-in-Place Concrete" for installing concrete on composite joists.
- B. Division 04 Section "Unit Masonry" for installing bearing plates in unit masonry
- C. Division 05 Section "Structural Steel Framing" for bearing plates for steel joists.

1.3 DEFINITIONS

- A. SJI "Specifications": Steel Joist Institute's "Standard Specifications, Load Tables and Weight Tables for Steel Joists and Joist Girders" and "Standard Specification for CJ-Series Composite Steel Joists".
- B. Composite Steel Joists: Joists connected to a concrete slab using shear studs to provide composite action between the joist and slab.
- C. Special Joists: Steel joists or joist girders requiring modification by manufacturer to support nonuniform, unequal, or special loading conditions that invalidate load tables in SJI's "Specifications"

1.4 PERFORMANCE REQUIREMENTS

- A. Structural Performance: Provide special joists and connections capable of withstanding design loads indicated
- B. Design special joists to withstand design loads with live load deflections no greater than the following
 - 1. Roof Joists: Vertical deflection of 1/360 of the span.

1.5 SUBMITTALS

- A. Product Data: For each type of joist, accessory, and product indicated
- B. Shop Drawings: Show layout, designation, number, type, location, and spacings of joists. Include joining and anchorage details, bracing, bridging, joist accessories; splice and connection locations and details; and attachments to other construction
 - 1. Comprehensive engineering analysis of special joists and composite joists signed and sealed by the qualified professional engineer responsible for its preparation.
 - 2. For composite steel joists and the joist manufacture shall indicate the size, quantity and layout of steel headed stud anchors required on the stud installation drawings.

1.6 QUALITY ASSURANCE

- A. Manufacturer Qualifications: A manufacturer certified by SJI to manufacture joists complying with applicable standard specifications and load tables of SJI "Specifications"
- B. Manufacturer's responsibilities include providing professional engineering services for designing special joists and composite joists to comply with performance requirements.
- C. SJI Specifications: Comply with standard specifications in SJI's "Specifications" that are applicable to types of joists indicated
- D. Welding: Qualify procedures and personnel according to AWS D1.1/D1.1M, "Structural Welding Code - Steel"

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Deliver, store, and handle joists as recommended in SJI's "Specifications"
- B. Protect joists from corrosion, deformation, and other damage during delivery, storage, and handling

SECTION 05210

STEEL JOIST FRAMING

1.8 SEQUENCING

- A. Deliver steel bearing plates to be built into masonry construction

PART 2 – PRODUCTS

2.1 MATERIALS

- A. Steel: Comply with SJI's "Specifications" for web and steel-angle chord members
- B. Steel Bearing Plates: ASTM A 36/A 36M
- C. High-Strength Bolts, Nuts, and Washers: ASTM F3125, GR A 325, Type 1, heavy hex steel structural bolts; ASTM A 563 heavy hex carbon-steel nuts; and ASTM F 436 hardened carbon-steel washers
 1. Finish: Plain.
- D. Welding Electrodes: Comply with AWS standards

2.2 PRIMERS

- A. Primer: SSPC-Paint 15, or manufacturer's standard shop primer complying with performance requirements in SSPC-Paint 15

2.3 K-SERIES STEEL JOISTS

- A. Manufacture steel joists of type indicated according to "Standard Specifications for Open Web Steel Joists, K-Series" in SJI's "Specifications," with steel-angle top- and bottom-chord members, underslung ends, and parallel top chord
 1. Joist Type: K-series steel joists.
- B. Steel Joist Substitutes: Manufacture according to "Standard Specifications for Open Web Steel Joists, K-Series" in SJI's "Specifications," with steel-angle or -channel members
- C. Comply with AWS requirements and procedures for shop welding, appearance, quality of welds, and methods used in correcting welding work
- D. Extended Ends: Extend bearing ends of joists with SJI's Type R extended ends where indicated, complying with SJI's "Specifications"
- E. Camber joists according to SJI's "Specifications" unless noted otherwise
- F. Equip bearing ends of joists with manufacturer's standard beveled ends or sloped shoes if joist slope exceeds 1/4 inch per 12 inches (1:48)

2.4 COMPOSITE STEEL JOISTS

- A. Manufacture steel joists according to SJI's "Standard Specifications for CJ-Series Composite Steel Joists" with steel-angle top- and bottom-chord members; of joist type and end and top-chord arrangements as follows:
 1. Joist Type: CJ-Series composite joists
 2. End Arrangement: Underslung
- B. Comply with AWS requirements and procedures for shop welding, appearance, quality of welds, and methods used in correcting welding work
- C. Camber long-span steel joists according to SJI's "Specifications" unless noted otherwise

2.5 JOIST ACCESSORIES

- A. Bridging: Provide bridging anchors and number of rows of horizontal or diagonal bridging of material, size, and type required by SJI's "Specifications" for type of joist, chord size, spacing, and span. Furnish additional erection bridging if required for stability. Furnish additional row of bottom chord bridging at ends of joists where net uplift is indicated
- B. Fabricate steel bearing plates with integral anchorages of sizes and thicknesses indicated
- C. Supply miscellaneous accessories, including splice plates and bolts required by joist manufacturer to complete joist installation

SECTION 05210

STEEL JOIST FRAMING

2.6 CLEANING AND SHOP PAINTING

- A. Clean and remove loose scale, heavy rust, and other foreign materials from fabricated joists and accessories by hand-tool cleaning, SSPC-SP 2.
- B. Do not prime paint joists and accessories to receive sprayed fire-resistive materials or composite steel joists.
- C. Apply 1 coat of shop primer to joists and joist accessories to be primed to provide a continuous, dry paint film not less than 1 mil (0.025 mm) thick

PART 3 – EXECUTION

3.1 EXAMINATION

- A. Examine supporting substrates, embedded bearing plates, and abutting structural framing for compliance with requirements for installation tolerances and other conditions affecting performance
 - 1. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. Do not install joists until supporting construction is in place and secured and has reached a sufficient strength to support joists.
- B. Install joists and accessories plumb, square, and true to line; securely fasten to supporting construction according to SJI's "Specifications," joist manufacturer's written recommendations, and requirements in this Section
 - 1. Before installation, splice joists delivered to Project site in more than one piece.
 - 2. Space, adjust, and align joists accurately in location before permanently fastening.
 - 3. Install temporary bracing and erection bridging, connections, and anchors to ensure that joists are stabilized during construction.
 - 4. Do not rigidly connect bottom-chord extension to columns or supports unless specifically indicated and not until dead loads have been applied.
- C. Field weld joists to supporting steel bearing plates and framework. Coordinate welding sequence and procedure with placement of joists. Comply with AWS requirements and procedures for welding, appearance and quality of welds, and methods used in correcting welding work
- D. Where indicated or required for erection bolt joists to supporting steel framework using high - strength structural bolts. Comply with RCSC's "Specification for Structural Joints Using High Strength Bolts" for high-strength structural bolt installation and tightening requirements.
- E. Install and connect bridging concurrently with joist erection, before construction loads are applied. Anchor ends of bridging lines at top and bottom chords if terminating at walls or beams

3.3 FIELD QUALITY CONTROL

- A. Testing Agency: Owner will engage a qualified independent testing and inspecting agency to inspect field welds and to perform field tests and inspections and prepare test and inspection reports
- B. Field welds will be visually inspected according to AWS D1.1/D1.1M
- C. In addition to visual inspection, field welds may be tested according to AWS D1.1/D1.1M and the following procedures, as applicable
 - 1. Radiographic Testing: ASTM E 94.
 - 2. Magnetic Particle Inspection: ASTM E 709.
 - 3. Ultrasonic Testing: ASTM E 164.
 - 4. Liquid Penetrant Inspection: ASTM E 165.
- D. High-strength, field-bolted splice connections will be tested and verified according to procedures in RCSC's "Specification for Structural Joints Using High Strength Bolts."

SECTION 05210

STEEL JOIST FRAMING

- E. Correct deficiencies in Work that test and inspection reports have indicated are not in compliance with specified requirements
- F. Additional testing will be performed to determine compliance of corrected Work with specified requirements

3.4 REPAIRS AND PROTECTION

- A. Repair damaged galvanized coatings on galvanized items with galvanized repair paint according to ASTM A 780 and manufacturer's written instructions
- B. Touchup Painting: After installation, promptly clean, prepare, and prime or reprime field connections, rust spots, and abraded surfaces of prime-painted joists, abutting structural steel, and accessories
 - 1. Clean and prepare surfaces by hand-tool cleaning, SSPC-SP 2, or power-tool cleaning, SSPC-SP 3.
 - 2. Apply a compatible primer of same type as shop primer used on adjacent surfaces.
- C. Provide final protection and maintain conditions, in a manner acceptable to manufacturer and Installer that ensure that joists and accessories are without damage or deterioration at time of Substantial Completion

END OF SECTION

SECTION 05310

STEEL DECKING

PART 1 – GENERAL

1.1 SECTION INCLUDES

- A. Roof deck

1.2 SUBMITTALS

- A. Product Data: For each type of deck, accessory, and product indicated
- B. Shop Drawings: Show layout and types of deck panels, anchorage details, reinforcing channels, pans, cut deck openings, special jointing, accessories, and attachments to other construction
- C. Product Certificates: For each type of steel deck, signed by product manufacturer
- D. Field quality-control test and inspection reports
- E. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency, indicating that each of the following complies with requirements
 - 1. Power-actuated mechanical fasteners.
- F. Research/Evaluation Reports: For steel deck

1.3 QUALITY ASSURANCE

- A. Testing Agency Qualifications: An independent agency qualified according to ASTM E 329 for testing indicated
- B. Welding: Qualify procedures and personnel according to AWS D1.3, "Structural Welding Code - Sheet Steel"
- C. AISI Specifications: Comply with calculated structural characteristics of steel deck according to AISI's "North American Specification for the Design of Cold-Formed Steel Structural Members"
- D. FMG Listing: Provide steel roof deck evaluated by FMG and listed in its "Approval Guide, Building Materials" for Class 1 fire rating and Class 1-90 windstorm ratings

1.4 DELIVERY, STORAGE, AND HANDLING

- A. Protect steel deck from corrosion, deformation, and other damage during delivery, storage, and handling
- B. Stack steel deck on platforms or pallets and slope to provide drainage. Protect with a waterproof covering and ventilate to avoid condensation

PART 2 – PRODUCTS

2.1 ROOF DECK

- A. Steel Roof Deck: Fabricate panels, without top-flange stiffening grooves, to comply with "SDI Specifications and Commentary for Steel Roof Deck," in SDI Publication No. 30, and with the following
 - 1. Galvanized and Shop-Primed Steel Sheet: ASTM A 653/A 653M, Structural Steel (SS), Grade 33, G60 zinc coating; cleaned, pretreated, and primed with manufacturer's standard baked-on, rust-inhibitive primer.
 - a. Color: Manufacturer's standard.
 - 2. Span Condition: Triple span or more.
 - 3. Side Laps: Overlapped.

2.2 ACCESSORIES

- A. General: Provide manufacturer's standard accessory materials for deck that comply with requirements indicated
- B. Mechanical Fasteners: Corrosion-resistant, low-velocity, power-actuated or pneumatically driven carbon-steel fasteners; or self-drilling, self-threading screws
- C. Side-Lap Fasteners: Corrosion-resistant, hexagonal washer head; self-drilling, carbon-steel screws, No. 10 (4.8-mm) minimum diameter
- D. Flexible Closure Strips: Vulcanized, closed-cell, synthetic rubber

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STEEL DECKING

- E. Miscellaneous Sheet Metal Deck Accessories: Steel sheet, minimum yield strength of 33,000 psi (230 MPa), not less than 0.0359-inch (0.91-mm) design uncoated thickness, of same material and finish as deck; of profile indicated or required for application
- F. Flat Sump Plate: Single-piece steel sheet, 0.0747 inch (1.90 mm) thick, of same material and finish as deck. For drains, cut holes in the field
- G. Galvanizing Repair Paint: SSPC-Paint 20 or DOD-P-21035, with dry film containing a minimum of 94 percent zinc dust by weight
- H. Repair Paint: Manufacturer's standard rust-inhibitive primer of same color as primer

PART 3 – EXECUTION

3.1 EXAMINATION

- A. Examine supporting frame and field conditions for compliance with requirements for installation tolerances and other conditions affecting performance

3.2 INSTALLATION, GENERAL

- A. Install deck panels and accessories according to applicable specifications and commentary in SDI Publication No. 30, manufacturer's written instructions, and requirements in this Section
- B. Locate deck bundles to prevent overloading of supporting members
- C. Place deck panels on supporting frame and adjust to final position with ends accurately aligned and bearing on supporting frame before being permanently fastened. Do not stretch or contract side-lap interlocks
- D. Place deck panels flat and square and fasten to supporting frame without warp or deflection
- E. Cut and neatly fit deck panels and accessories around openings and other work projecting through or adjacent to deck
- F. Provide additional reinforcement and closure pieces at openings as required for strength, continuity of deck, and support of other work
- G. Comply with AWS requirements and procedures for manual shielded metal arc welding, appearance and quality of welds, and methods used for correcting welding work
- H. Mechanical fasteners may be used in lieu of welding to fasten deck after written approval by the Architect and Structural Engineer. Locate mechanical fasteners and install according to deck manufacturer's written instructions

3.3 ROOF-DECK INSTALLATION

- A. Fasten roof-deck panels to steel supporting members by arc spot (puddle) welds of the surface diameter indicated or arc seam welds with an equal perimeter that is not less than 1-1/2 inches (38 mm) long, and as follows
 - 1. Weld Diameter: 5/8 inch, nominal.
 - 2. Weld Spacing: Weld edge and interior ribs of deck units with a minimum of two welds per deck unit at each support. Space welds as indicated.
- B. Side-Lap and Perimeter Edge Fastening: Fasten side laps and perimeter edges of panels between supports, at intervals not exceeding the lesser of 1/2 of the span or 36 inches, and as follows
 - 1. Mechanically fasten with self-drilling, No. 10 (4.8-mm-) diameter or larger, carbon-steel screws.
- C. End Bearing: Install deck ends over supporting frame with a minimum end bearing of 1-1/2 inches, with end joints as follows
 - 1. End Joints: Lapped 2 inches minimum.
- D. Roof Sump Plates: Install over openings provided in roof deck and mechanically fasten flanges to top of deck. Space mechanical fasteners not more than 12 inches (305 mm) apart with at least one fastener at each corner

SECTION 05310

STEEL DECKING

- E. Miscellaneous Roof-Deck Accessories: Install ridge and valley plates, finish strips, end closures, and reinforcing channels according to deck manufacturer's written instructions. Weld or mechanically fasten to substrate to provide a complete deck installation
 - 1. Weld cover plates at changes in direction of roof-deck panels, unless otherwise indicated.
- F. Flexible Closure Strips: Install flexible closure strips over partitions, walls, and where indicated. Install with adhesive according to manufacturer's written instructions to ensure complete closure

3.4 FIELD QUALITY CONTROL

- A. Testing Agency: Owner will engage a qualified independent testing and inspecting agency to perform field tests and inspections and prepare test reports
- B. Field welds will be subject to inspection
- C. Testing agency will report inspection results promptly and in writing to Contractor and Architect
- D. Remove and replace work that does not comply with specified requirements
- E. Additional inspecting, at Contractor's expense, will be performed to determine compliance of corrected work with specified requirements

3.5 REPAIRS AND PROTECTION

- A. Galvanizing Repairs: Prepare and repair damaged galvanized coatings on both surfaces of deck with galvanized repair paint according to ASTM A 780 and manufacturer's written instructions
- B. Repair Painting: Wire brush and clean rust spots, welds, and abraded areas on both surfaces of prime-painted deck immediately after installation, and apply repair paint
 - 1. Apply repair paint, of same color as adjacent shop-primed deck, to bottom surfaces of deck exposed to view.
- C. Provide final protection and maintain conditions to ensure that steel deck is without damage or deterioration at time of Substantial Completion

END OF SECTION

SECTION 05400

COLD-FORMED METAL FRAMING

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes the following:
 - 1. Exterior non-load-bearing wall framing.
 - 2. Ceiling joist framing.
- B. Related Sections include the following:
 - 1. Section 05500 - "Metal Fabrications" for masonry shelf angles and connections.
 - 2. Section 09260 - "Non-Structural Metal Framing" for interior non-load bearing, metal-stud framing and ceiling-suspension assemblies.

1.3 PERFORMANCE REQUIREMENTS

- A. Structural Performance: Provide cold-formed metal framing capable of withstanding design loads within limits and under conditions indicated.
 - 1. Design Loads: As indicated on Drawings.
 - 2. Deflection Limits: As indicated on Drawings.
 - 3. Design framing systems to provide for movement of framing members without damage or overstressing, sheathing failure, connection failure, undue strain on fasteners and anchors, or other detrimental effects when subject to a maximum ambient temperature change of 120 deg F (67 deg C).
 - 4. Design framing system to maintain clearances at openings, to allow for construction tolerances, and to accommodate live load deflection of primary building structure as follows:
 - a. As indicated on Drawings.
- B. Cold-Formed Steel Framing, General: Design according to AISI's "Standard for Cold-Formed Steel Framing - General Provisions."
 - 1. Headers: Design according to AISI's "Standard for Cold-Formed Steel Framing - Header Design."
 - 2. Design exterior non-load-bearing wall framing to accommodate horizontal deflection without regard for contribution of sheathing materials.

1.4 SUBMITTALS

- A. Product Data: For each type of cold-formed metal framing product and accessory indicated.
- B. Shop Drawings: Show layout, spacing, sizes, thicknesses, and types of cold-formed metal framing; fabrication; and fastening and anchorage details, including mechanical fasteners. Show reinforcing channels, opening framing, supplemental framing, strapping, bracing, bridging, splices, accessories, connection details, and attachment to adjoining work.
 - 1. For cold-formed metal framing indicated to comply with design loads, include structural analysis data signed and sealed by the qualified professional engineer responsible for their preparation.
- C. Welding certificates.
- D. Qualification Data: For professional engineer and testing agency.
- E. Product Test Reports: From a qualified testing agency, unless otherwise stated, indicating that each of the following complies with requirements, based on evaluation of comprehensive tests for current products:
 - 1. Steel sheet.
 - 2. Expansion anchors.
 - 3. Power-actuated anchors.
 - 4. Mechanical fasteners.
 - 5. Vertical deflection clips.
 - 6. Horizontal drift deflection clips
 - 7. Miscellaneous structural clips and accessories.

SECTION 05400

COLD-FORMED METAL FRAMING

- F. Research/Evaluation Reports: For cold-formed metal framing.

1.5 QUALITY ASSURANCE

- A. Engineering Responsibility: Preparation of Shop Drawings, design calculations, and other structural data by a qualified professional engineer.
- B. Professional Engineer Qualifications: A Professional Engineer who is legally qualified to practice in jurisdiction where Project is located and who is experienced in providing engineering services of the kind indicated. Engineering services are defined as those performed for installations of cold-formed metal framing that are similar to those indicated for this Project in material, design, and extent.
- C. Testing Agency Qualifications: An independent testing agency, acceptable to authorities having jurisdiction, qualified according to ASTM E 329 to conduct the testing indicated.
- D. Product Tests: Mill certificates or data from a qualified independent testing agency indicating steel sheet complies with requirements, including base-metal thickness, yield strength, tensile strength, total elongation, chemical requirements, ductility, and metallic-coating thickness.
- E. Welding: Qualify procedures and personnel according to AWS D1.1/D1.1M, "Structural Welding Code--Steel," and AWS D1.3, "Structural Welding Code--Sheet Steel."
- F. Fire-Test-Response Characteristics: Where indicated, provide cold-formed metal framing identical to that of assemblies tested for fire resistance per ASTM E 119 by a testing and inspecting agency acceptable to authorities having jurisdiction.
- G. AISI Specifications and Standards: Comply with AISI's "North American Specification for the Design of Cold-Formed Steel Structural Members" and its "Standard for Cold-Formed Steel Framing - General Provisions."
 - 1. Comply with AISI's "Standard for Cold-Formed Steel Framing - Header Design."

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Protect cold-formed metal framing from corrosion, deformation, and other damage during delivery, storage, and handling.
- B. Store cold-formed metal framing, protect with a waterproof covering, and ventilate to avoid condensation.

PART 2 – PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, provide cold-formed metal framing by one of the following:
 - 1. Allied Studco.
 - 2. AllSteel Products, Inc.
 - 3. California Expanded Metal Products Company.
 - 4. Clark Steel Framing.
 - 5. Consolidated Fabricators Corp.; Building Products Division.
 - 6. Craco Metals Manufacturing, LLC.
 - 7. Custom Stud, Inc.
 - 8. Dale/Incor.
 - 9. Design Shapes in Steel.
 - 10. Dietrich Metal Framing; a Worthington Industries Company.
 - 11. Formetal Co. Inc. (The).
 - 12. Innovative Steel Systems.
 - 13. MarinoWare; a division of Ware Industries.
 - 14. Quail Run Building Materials, Inc.
 - 15. SCAFCO Corporation.
 - 16. Southeastern Stud & Components, Inc.
 - 17. Steel Construction Systems.
 - 18. Steeler, Inc.

SECTION 05400

COLD-FORMED METAL FRAMING

19. Super Stud Building Products, Inc.
20. United Metal Products, Inc.
21. Substitutions: Refer to Section 01600 for product requirements.

2.2 MATERIALS

- A. Steel Sheet: ASTM A 1003/A 1003M, Structural Grade, Type H, metallic coated, of grade and coating weight as follows:
 1. Grade: As required by structural performance.
 2. Coating: As indicated on the structural drawings.
- B. Steel Sheet for Vertical Deflection and Drift Clips: ASTM A 653/A 653M, structural steel, zinc coated, of grade and coating as follows:
 1. Grade: As required by structural performance.
 2. Coating: G90 (Z275).

2.3 EXTERIOR NON-LOAD-BEARING WALL FRAMING

- A. Steel Studs: Manufacturer's standard C-shaped steel studs, of web depths indicated, punched, with stiffened flanges, and as follows:
 1. Minimum Base-Metal Thickness: As indicated on the structural drawings.
 2. Flange Width: As indicated on the structural drawings.
- B. Steel Track: Manufacturer's standard U-shaped steel track, of web depths indicated, unpunched, with unstiffened flanges, and as follows:
 1. Minimum Base-Metal Thickness: As indicated on the structural drawings.
 2. Flange Width: As indicated on the structural drawings.
- C. Vertical Deflection Clips: Manufacturer's standard clips, capable of accommodating upward and downward vertical displacement of primary structure through positive mechanical attachment to stud web.
 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Dietrich Metal Framing; a Worthington Industries Company.
 - b. MarinoWare, a division of Ware Industries.
 - c. SCAFCO Corporation
 - d. The Steel Network, Inc.
 2. Substitutions: Refer to Section 01600 for product requirements.
- D. Single Deflection Track: Manufacturer's single, deep-leg, U-shaped steel track; unpunched, with unstiffened flanges, of web depth to contain studs while allowing free vertical movement, with flanges designed to support horizontal and lateral loads and transfer them to the primary structure, and as follows:
 1. Minimum Base-Metal Thickness: As indicated on the structural drawings.
 2. Flange Width: As indicated on the structural drawings.
- E. Double Deflection Tracks: Manufacturer's double, deep-leg, U-shaped steel tracks, consisting of nested inner and outer tracks; unpunched, with unstiffened flanges.
 1. Outer Track: Of web depth to allow free vertical movement of inner track, with flanges designed to support horizontal and lateral loads and transfer them to the primary structure, and as follows:
 - a. Minimum Base-Metal Thickness: As indicated on the structural drawings.
 - b. Flange Width: As indicated on the structural drawings.
 2. Depth indicated, and as follows:
 - a. Minimum Base-Metal Thickness: As indicated on the structural drawings.
 - b. Flange Width: As indicated on the structural drawings.
- F. Drift Clips: Manufacturer's standard bypass or head clips, capable of isolating wall stud from upward and downward vertical displacement and lateral drift of primary structure.

SECTION 05400

COLD-FORMED METAL FRAMING

2.4 CEILING JOIST FRAMING

- A. Steel Ceiling Joists: Manufacturer's standard C-shaped steel sections, of web depths indicated, with stiffened flanges, and as follows:
 - 1. Minimum Base-Metal Thickness: As indicated on the structural drawings.
 - 2. Flange Width: As indicated on the structural drawings.
 - 3. Section Properties: As indicated on the structural drawings.

2.5 FRAMING ACCESSORIES

- A. Fabricate steel-framing accessories from steel sheet, ASTM A 1003/A 1003M, Structural Grade, Type H, metallic coated, of same grade and coating weight used for framing members.
- B. Provide accessories of manufacturer's standard thickness and configuration, unless otherwise indicated, as follows:
 - 1. Supplementary framing.
 - 2. Bracing, bridging, and solid blocking.
 - 3. Web stiffeners.
 - 4. Anchor clips.
 - 5. End clips.
 - 6. Foundation clips.
 - 7. Gusset plates.
 - 8. Stud kickers, knee braces, and girts.
 - 9. Joist hangers and end closures.
 - 10. Hole reinforcing plates.
 - 11. Backer plates.

2.6 ANCHORS, CLIPS, AND FASTENERS

- A. Steel Shapes and Clips: ASTM A 36/A 36M, zinc coated by hot-dip process according to ASTM A 123/A 123M.
- B. Anchor Bolts: As indicated on the structural drawings.
- C. Expansion Anchors: Fabricated from corrosion-resistant materials, with capability to sustain, without failure, a load equal to 5 times design load, as determined by testing per ASTM E 488 conducted by a qualified independent testing agency.
- D. Power-Actuated Anchors: Fastener system of type suitable for application indicated, fabricated from corrosion-resistant materials, with capability to sustain, without failure, a load equal to 10 times design load, as determined by testing per ASTM E 1190 conducted by a qualified independent testing agency.
- E. Mechanical Fasteners: ASTM C 1513, corrosion-resistant-coated, self-drilling, self-tapping steel drill screws.
 - 1. Head Type: Low-profile head beneath sheathing, manufacturer's standard elsewhere.
- F. Welding Electrodes: Comply with AWS standards.

2.7 MISCELLANEOUS MATERIALS

- A. Galvanizing Repair Paint: ASTM A 780.
- B. Cement Grout: Portland cement, ASTM C 150, Type I; and clean, natural sand, ASTM C 404. Mix at ratio of 1 part cement to 2-1/2 parts sand, by volume, with minimum water required for placement and hydration.
- C. Nonmetallic, Nonshrink Grout: Premixed, nonmetallic, noncorrosive, nonstaining grout containing selected silica sands, portland cement, shrinkage-compensating agents, and plasticizing and water-reducing agents, complying with ASTM C 1107, with fluid consistency and 30-minute working time.
- D. Shims: Load bearing, high-density multimonomer plastic, nonleaching.
- E. Sealer Gaskets: Closed-cell neoprene foam, 1/4 inch (6.4 mm) thick, selected from manufacturer's standard widths to match width of bottom track or rim track members.

SECTION 05400

COLD-FORMED METAL FRAMING

2.8 FABRICATION

- A. Fabricate cold-formed metal framing and accessories plumb, square, and true to line, and with connections securely fastened, according to referenced AISI's specifications and standards, manufacturer's written instructions, and requirements in this Section.
 - 1. Fabricate framing assemblies using jigs or templates.
 - 2. Cut framing members by sawing or shearing; do not torch cut.
 - 3. Fasten cold-formed metal framing members by welding, screw fastening, clinch fastening, or riveting as standard with fabricator. Wire tying of framing members is not permitted.
 - a. Comply with AWS D1.3 requirements and procedures for welding, appearance and quality of welds, and methods used in correcting welding work.
 - b. Locate mechanical fasteners and install according to Shop Drawings, with screw penetrating joined members by not less than three exposed screw threads.
 - 4. Fasten other materials to cold-formed metal framing by welding, bolting, or screw fastening, according to Shop Drawings.
- B. Reinforce, stiffen, and brace framing assemblies to withstand handling, delivery, and erection stresses. Lift fabricated assemblies to prevent damage or permanent distortion.
- C. Fabrication Tolerances: Fabricate assemblies level, plumb, and true to line to a maximum allowable tolerance variation of 1/8 inch in 10 feet (1:960) and as follows:
 - 1. Spacing: Space individual framing members no more than plus or minus 1/8 inch (3 mm) from plan location. Cumulative error shall not exceed minimum fastening requirements of sheathing or other finishing materials.
 - 2. Squareness: Fabricate each cold-formed metal framing assembly to a maximum out-of-square tolerance of 1/8 inch (3 mm).

PART 3 – EXECUTION

3.1 EXAMINATION

- A. Examine supporting substrates and abutting structural framing for compliance with requirements for installation tolerances and other conditions affecting performance.
 - 1. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Install load bearing shims or grout between the underside of wall bottom track or rim track and the top of foundation wall or slab at stud or joist locations to ensure a uniform bearing surface on supporting concrete or masonry construction.
- B. Install sealer gaskets to isolate the underside of wall bottom track or rim track and the top of foundation wall or slab at stud or joist locations.

3.3 INSTALLATION, GENERAL

- A. Cold-formed metal framing may be shop or field fabricated for installation, or it may be field assembled.
- B. Install cold-formed metal framing according to AISI's "Standard for Cold-Formed Steel Framing - General Provisions" and to manufacturer's written instructions unless more stringent requirements are indicated.
- C. Install shop- or field-fabricated, cold-formed framing and securely anchor to supporting structure.
 - 1. Screw, bolt, or weld wall panels at horizontal and vertical junctures to produce flush, even, true-to-line joints with maximum variation in plane and true position between fabricated panels not exceeding 1/16 inch (1.6 mm).
- D. Install cold-formed metal framing and accessories plumb, square, and true to line, and with connections securely fastened.
 - 1. Cut framing members by sawing or shearing; do not torch cut.
 - 2. Fasten cold-formed metal framing members by welding, screw fastening, clinch fastening, or riveting. Wire tying of framing members is not permitted.

SECTION 05400

COLD-FORMED METAL FRAMING

- a. Comply with AWS D1.3 requirements and procedures for welding, appearance and quality of welds, and methods used in correcting welding work.
- b. Locate mechanical fasteners and install according to Shop Drawings, and complying with requirements for spacing, edge distances, and screw penetration.
- E. Install framing members in one-piece lengths unless splice connections are indicated for track or tension members.
- F. Install temporary bracing and supports to secure framing and support loads comparable in intensity to those for which structure was designed. Maintain braces and supports in place, undisturbed, until entire integrated supporting structure has been completed and permanent connections to framing are secured.
- G. Do not bridge building expansion and control joints with cold-formed metal framing. Independently frame both sides of joints.
- H. Install insulation, specified in Division 07 Section "Thermal Insulation," in built-up exterior framing members, such as headers, sills, boxed joists, and multiple studs at openings, that are inaccessible on completion of framing work.
- I. Fasten hole reinforcing plate over web penetrations that exceed size of manufacturer's standard punched openings.
- J. Erection Tolerances: Install cold-formed metal framing level, plumb, and true to line to a maximum allowable tolerance variation of 1/8 inch in 10 feet (1:960) and as follows:
 1. Space individual framing members no more than plus or minus 1/8 inch (3 mm) from plan location. Cumulative error shall not exceed minimum fastening requirements of sheathing or other finishing materials.

3.4 EXTERIOR NON-LOAD-BEARING WALL INSTALLATION

- A. Install continuous tracks sized to match studs. Align tracks accurately and securely anchor to supporting structure as indicated.
- B. Fasten both flanges of studs to bottom track, unless otherwise indicated. Space studs as follows:
 1. Stud Spacing: As indicated on the structural drawings.
 2. Stud Spacing: As indicated on the structural drawings.
- C. Set studs plumb, except as needed for diagonal bracing or required for non-plumb walls or warped surfaces and similar requirements.
- D. Isolate non-load-bearing steel framing from building structure to prevent transfer of vertical loads while providing lateral support.
 1. Install single-leg deflection tracks and anchor to building structure.
 2. Install double deep-leg deflection tracks and anchor outer track to building structure.
 3. Connect vertical deflection clips to studs and anchor to building structure.
 4. Connect drift clips to cold formed metal framing and anchor to building structure.
- E. Install horizontal bridging in wall studs, spaced in rows indicated on Shop Drawings but not more than 48 inches (1220 mm) apart. Fasten at each stud intersection.
 1. Top Bridging for Single Deflection Track: Install row of horizontal bridging of single deflection track. Install a combination of flat, taut, steel sheet straps of width and thickness indicated and stud or stud-track solid blocking of width and thickness matching studs. Fasten flat straps to stud flanges and secure solid blocking to stud webs or flanges.
 - a. Install solid blocking at centers indicated on Shop Drawings.
 2. Bridging: Cold-rolled steel channel, welded or mechanically fastened to webs of punched studs.
 3. Bridging: Combination of flat, taut, steel sheet straps of width and thickness indicated and stud-track solid blocking of width and thickness to match studs. Fasten flat straps to stud flanges and secure solid blocking to stud webs or flanges.
 4. Bridging: Proprietary bridging bars installed according to manufacturer's written instructions.
- F. Install miscellaneous framing and connections, including stud kickers, web stiffeners, clip angles, continuous angles, anchors, fasteners, and stud girts, to provide a complete and stable wall-framing system.

SECTION 05400

COLD-FORMED METAL FRAMING

3.5 JOIST INSTALLATION

- A. Install perimeter joist track sized to match joists. Align and securely anchor or fasten track to supporting structure at corners, ends, and spacings indicated on Shop Drawings.
- B. Install joists bearing on supporting frame, level, straight, and plumb; adjust to final position, brace, and reinforce. Fasten joists to both flanges of joist track.
 - 1. Install joists over supporting frame with a minimum end bearing of 1-1/2 inches (38 mm).
 - 2. Reinforce ends and bearing points of joists with web stiffeners, end clips, joist hangers, steel clip angles, or steel-stud sections as indicated on Shop Drawings.
- C. Space joists not more than 2 inches (51 mm) from abutting walls, and as follows:
 - 1. Joist Spacing: As indicated on the structural drawings.
- D. Frame openings with built-up joist headers consisting of joist and joist track, nesting joists, or another combination of connected joists if indicated.
- E. Install joist reinforcement at interior supports with single, short length of joist section located directly over interior support, with lapped joists of equal length to joist reinforcement, or as indicated on Shop Drawings.
 - 1. Install web stiffeners to transfer axial loads of walls above.
- F. Install bridging at intervals indicated on Shop Drawings. Fasten bridging at each joist intersection as follows:
 - 1. Bridging: Joist-track solid blocking of width and thickness indicated, secured to joist webs.
 - 2. Bridging: Combination of flat, taut, steel sheet straps of width and thickness indicated and joist-track solid blocking of width and thickness indicated. Fasten flat straps to bottom flange of joists and secure solid blocking to joist webs.
- G. Secure joists to load-bearing interior walls to prevent lateral movement of bottom flange.
- H. Install miscellaneous joist framing and connections, including web stiffeners, closure pieces, clip angles, continuous angles, hold-down angles, anchors, and fasteners, to provide a complete and stable joist-framing assembly.

3.6 FIELD QUALITY CONTROL

- A. Testing: Owner will engage a qualified independent testing and inspecting agency to perform field tests and inspections and prepare test reports.
- B. Field and shop welds will be subject to testing and inspecting.
- C. Testing agency will report test results promptly and in writing to Contractor and Architect.
- D. Remove and replace work where test results indicate that it does not comply with specified requirements.
- E. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.

3.7 REPAIRS AND PROTECTION

- A. Galvanizing Repairs: Prepare and repair damaged galvanized coatings on fabricated and installed cold-formed metal framing with galvanized repair paint according to ASTM A 780 and manufacturer's written instructions.
- B. Provide final protection and maintain conditions, in a manner acceptable to manufacturer and installer that ensure that cold-formed metal framing is without damage or deterioration at time of Substantial Completion.

END OF SECTION

SECTION 05500

METAL FABRICATIONS

PART 1 – GENERAL

1.1 SECTION INCLUDES

- A. Products furnished and installed under this Section
 - 1. Steel framing and supports for applications where framing and supports are not specified in other Sections.
 - 2. Miscellaneous steel trim including steel angle corner guards.
 - 3. Metal bollards.
 - 4. Metal ladders
 - 5. Loose bearing and leveling plates for applications where they are not specified in other Sections.
- B. Products furnished, but not installed, under this Section
 - 1. Loose steel lintels.
 - 2. Anchor bolts, steel pipe sleeves indicated to be cast into concrete or built into unit masonry where they are not specified in other Sections.
 - 3. Steel weld plates and angles for casting into concrete for applications where they are not specified in other Sections.

1.2 RELATED SECTIONS

- A. Division 03 Section "Cast-in-Place Concrete" for installing anchor bolts, steel pipe sleeves and other items cast into concrete
- B. Division 04 Section "Unit Masonry" for installing loose lintels, anchor bolts, and other items built into unit masonry
- C. Division 05 Section "Structural Steel Framing"
- D. Division 05 Section "Metal Stairs"
- E. Division 05 Section "Pipe and Tube Railings"

1.3 SUBMITTALS

- A. Product Data: For the following
 - 1. Paint products.
 - 2. Grout.
- B. Shop Drawings: Show fabrication and installation details for metal fabrications
 - 1. Include plans, elevations, sections, and details of metal fabrications and their connections. Show anchorage and accessory items.
- C. Mill Certificates: Signed by manufacturers of stainless-steel certifying that products furnished comply with requirements
- D. Welding certificates
- E. Paint Compatibility Certificates: From manufacturers of topcoats applied over shop primers certifying that shop primers are compatible with topcoats

1.4 QUALITY ASSURANCE

- A. Welding Qualifications: Qualify procedures and personnel according to AWS D1.1/D1.1M, "Structural Welding Code - Steel"
- B. Welding Qualifications: Qualify procedures and personnel according to the following
 - 1. AWS D1.1/D1.1M, "Structural Welding Code - Steel."

1.5 PROJECT CONDITIONS

- A. Field Measurements: Verify actual locations of walls and other construction contiguous with metal fabrications by field measurements before fabrication

1.6 COORDINATION

- A. Coordinate selection of shop primers with topcoats to be applied over them. Comply with paint and coating manufacturers' written recommendations to ensure that shop primers and topcoats are compatible with one another

SECTION 05500

METAL FABRICATIONS

- B. Coordinate installation of anchorages and steel weld plates and angles for casting into concrete. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors, that are to be embedded in concrete or masonry. Deliver such items to Project site in time for installation

PART 2 – PRODUCTS

2.1 METALS, GENERAL

- A. Metal Surfaces, General: Provide materials with smooth, flat surfaces unless otherwise indicated. For metal fabrications exposed to view in the completed Work, provide materials without seam marks, roller marks, rolled trade names, or blemishes

2.2 FERROUS METALS

- A. Steel Plates, Shapes, and Bars: ASTM A 36/A 36M
- B. Steel Tubing: ASTM A 500, cold-formed steel tubing
- C. Steel Pipe: ASTM A 53/A 53M, standard weight (Schedule 40) unless otherwise indicated

2.3 FASTENERS

- A. Steel Bolts and Nuts: Regular hexagon-head bolts, ASTM A 307, Grade A (ASTM F 568M, Property Class 4.6); with hex nuts, ASTM A 563 (ASTM A 563M); and, where indicated, flat washers
- B. High Strength Steel Bolts and Nuts: Regular hexagon-head bolts, ASTM A 325, Type 3 (ASTM A 325M, Type 3); with hex nuts, ASTM A 563, Grade C3 (ASTM A 563M, Class 8S3); and, where indicated, flat washers
- C. Anchor Bolts: ASTM F 1554, Grade 36, of dimensions indicated; with nuts, ASTM A 563; and, where indicated, flat washers
 - 1. Hot-dip galvanize or provide mechanically deposited, zinc coating where item being fastened is indicated to be galvanized.
- D. Machine Screws: ASME B18.6.3 (ASME B18.6.7M)
- E. Plain Washers: Round, ASME B18.22.1 (ASME B18.22M)
- F. Lock Washers: Helical, spring type, ASME B18.21.1 (ASME B18.21.2M)
- G. Anchors, General: Anchors capable of sustaining, without failure, a load equal to six times the load imposed when installed in unit masonry and four times the load imposed when installed in concrete, as determined by testing according to ASTM E 488, conducted by a qualified independent testing agency
- H. Cast-in-Place Anchors in Concrete: Either threaded type or wedge type unless otherwise indicated; galvanized ferrous castings, either ASTM A 47/A 47M malleable iron or ASTM A 27/A 27M cast steel. Provide bolts, washers, and shims as needed, all hot-dip galvanized per ASTM F 2329
- I. Post-Installed Anchors: Torque-controlled expansion anchors or chemical anchors

2.4 MISCELLANEOUS MATERIALS

- A. Welding Rods and Bare Electrodes: Select according to AWS specifications for metal alloy welded
- B. Universal Shop Primer: Fast-curing, lead- and chromate-free, universal modified-alkyd primer complying with MPI#79 and compatible with topcoat
 - 1. Use primer containing pigments that make it easily distinguishable from zinc-rich primer.
- C. Epoxy Zinc-Rich Primer: Complying with MPI#20 and compatible with topcoat
- D. Galvanizing Repair Paint: High-zinc-dust-content paint complying with SSPC-Paint 20 and compatible with paints specified to be used over it
- E. Nonshrink, Nonmetallic Grout: Factory-packaged, nonstaining, noncorrosive, nongaseous grout complying with ASTM C 1107. Provide grout specifically recommended by manufacturer for interior and exterior applications

SECTION 05500

METAL FABRICATIONS

2.5 FABRICATION, GENERAL

- A. Shop Assembly: Preassemble items in the shop to greatest extent possible. Disassemble units only as necessary for shipping and handling limitations. Use connections that maintain structural value of joined pieces. Clearly mark units for reassembly and coordinated installation
- B. Cut, drill, and punch metals cleanly and accurately. Remove burrs and ease edges to a radius of approximately 1/32 inch (1 mm) unless otherwise indicated. Remove sharp or rough areas on exposed surfaces
- C. Form bent-metal corners to smallest radius possible without causing grain separation or otherwise impairing work
- D. Form exposed work with accurate angles and surfaces and straight edges
- E. Weld corners and seams continuously to comply with the following
 1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
 2. Obtain fusion without undercut or overlap.
 3. Remove welding flux immediately.
 4. At exposed connections, finish exposed welds and surfaces smooth and blended so no roughness shows after finishing.
- F. Form exposed connections with hairline joints, flush and smooth, using concealed fasteners or welds where possible. Where exposed fasteners are required, use Phillips flat-head (countersunk) fasteners unless otherwise indicated. Locate joints where least conspicuous
- G. Fabricate seams and other connections that will be exposed to weather in a manner to exclude water. Provide weep holes where water may accumulate
- H. Cut, reinforce, drill, and tap metal fabrications as indicated to receive finish hardware, screws, and similar items
- I. Provide for anchorage of type indicated; coordinate with supporting structure. Space anchoring devices to secure metal fabrications rigidly in place and to support indicated loads
 1. Where units are indicated to be cast into concrete or built into masonry, equip with integrally welded steel strap anchors, 1/8 by 1-1/2 inches (3.2 by 38 mm), with a minimum 6-inch (150-mm) embedment and 2-inch (50-mm) hook, not less than 8 inches (200 mm) from ends and corners of units and 24 inches (600 mm) o.c., unless otherwise indicated.

2.6 MISCELLANEOUS FRAMING AND SUPPORTS

- A. General: Provide steel framing and supports not specified in other Sections as needed to complete the Work
- B. Fabricate units from steel shapes, plates, and bars of welded construction unless otherwise indicated. Fabricate to sizes, shapes, and profiles indicated and as necessary to receive adjacent construction
- C. Galvanize miscellaneous framing and supports where indicated

2.7 METAL LADDERS

- A. General
 1. Comply with ANSI A14.3 unless otherwise indicated.
 2. For elevator pit ladders, comply with ASME A17.1.
- B. Steel Ladders
 1. Space siderails 18 inches apart unless otherwise indicated.
 2. Siderails: Continuous, 3/8-by-2-1/2-inch steel flat bars, with eased edges.
 3. Rungs: 3/4-inch- diameter steel bars.
 4. Fit rungs in centerline of siderails; plug-weld and grind smooth on outer rail faces.
 5. Support each ladder at top and bottom and not more than 60 inches o.c. with welded or bolted steel brackets.

SECTION 05500

METAL FABRICATIONS

2.8 MISCELLANEOUS STEEL TRIM

- A. Unless otherwise indicated, fabricate units from steel shapes, plates, and bars of profiles shown with continuously welded joints and smooth exposed edges. Miter corners and use concealed field splices where possible
- B. Provide cutouts, fittings, and anchorages as needed to coordinate assembly and installation with other work
 - 1. Provide with integrally welded steel strap anchors for embedding in concrete or masonry construction.
- C. Galvanize exterior miscellaneous steel trim

2.9 METAL BOLLARDS

- A. Fabricate metal bollards from Schedule 80 steel pipe
- B. Prime bollards with zinc-rich primer

2.10 LOOSE BEARING AND LEVELING PLATES

- A. Provide loose bearing and leveling plates for steel items bearing on masonry or concrete construction. Drill plates to receive anchor bolts and for grouting

2.11 LOOSE STEEL LINTELS

- A. Fabricate loose steel lintels from steel angles and shapes of size indicated for openings and recesses in masonry walls and partitions at locations indicated. Fabricate in single lengths for each opening unless otherwise indicated. Weld adjoining members together to form a single unit where indicated
- B. Size loose lintels to provide bearing length at each side of openings equal to 1/12 of clear span but not less than 8 inches (200 mm) unless otherwise indicated
- C. Galvanize loose steel lintels located in exterior walls

2.12 STEEL WELD PLATES AND ANGLES

- A. Provide steel weld plates and angles not specified in other Sections, for items supported from concrete construction as needed to complete the Work. Provide each unit with no fewer than two integrally welded steel strap anchors for embedding in concrete

2.13 FINISHES, GENERAL

- A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes
- B. Finish metal fabrications after assembly
- C. Finish exposed surfaces to remove tool and die marks and stretch lines, and to blend into surrounding surface

2.14 STEEL AND IRON FINISHES

- A. Galvanizing: Hot-dip galvanize items as indicated to comply with ASTM A 153/A 153M for steel and iron hardware and with ASTM A 123/A 123M for other steel and iron products
 - 1. Do not quench or apply post galvanizing treatments that might interfere with paint adhesion.
- B. Shop prime iron and steel items not indicated to be galvanized unless they are to be embedded in concrete, sprayed-on fireproofing, or masonry, or unless otherwise indicated
 - 1. Shop prime with universal shop unless otherwise indicated.
- C. Preparation for Shop Priming: Prepare surfaces to comply with SSPC-SP 3, "Power Tool Cleaning"
- D. Shop Priming: Apply shop primer to comply with SSPC-PA 1, "Paint Application Specification No. 1: Shop, Field, and Maintenance Painting of Steel," for shop painting
 - 1. Stripe paint corners, crevices, bolts, welds, and sharp edges.

SECTION 05500

METAL FABRICATIONS

PART 3 – EXECUTION

3.1 INSTALLATION, GENERAL

- A. Cutting, Fitting, and Placement: Perform cutting, drilling, and fitting required for installing metal fabrications. Set metal fabrications accurately in location, alignment, and elevation; with edges and surfaces level, plumb, true, and free of rack; and measured from established lines and levels
- B. Fit exposed connections accurately together to form hairline joints. Weld connections that are not to be left as exposed joints but cannot be shop welded because of shipping size limitations. Do not weld, cut, or abrade surfaces of exterior units that have been hot-dip galvanized after fabrication and are for bolted or screwed field connections
- C. Field Welding: Comply with the following requirements
 - 1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
 - 2. Obtain fusion without undercut or overlap.
 - 3. Remove welding flux immediately.
 - 4. At exposed connections, finish exposed welds and surfaces smooth and blended so no roughness shows after finishing and contour of welded surface matches that of adjacent surface.
- D. Fastening to In-Place Construction: Provide anchorage devices and fasteners where metal fabrications are required to be fastened to in-place construction. Provide threaded fasteners for use with concrete and masonry inserts, toggle bolts, through bolts, lag screws, wood screws, and other connectors
- E. Provide temporary bracing or anchors in formwork for items that are to be built into concrete, masonry, or similar construction

3.2 INSTALLING MISCELLANEOUS FRAMING AND SUPPORTS

- A. General: Install framing and supports to comply with requirements of items being supported, including manufacturers' written instructions and requirements indicated on Shop Drawings
- B. Anchor supports for operable partitions securely to and rigidly brace from building structure

3.3 INSTALLING METAL BOLLARDS

- A. Anchor bollards in place with concrete footings. Center and align bollards in holes 3 inches above bottom of excavation. Place concrete and vibrate or tamp for consolidation. Support and brace bollards in position until concrete has cured
- B. Fill bollards solidly with concrete, mounding top surface to shed water

3.4 INSTALLING BEARING AND LEVELING PLATES

- A. Clean concrete and masonry bearing surfaces of bond-reducing materials, and roughen to improve bond to surfaces. Clean bottom surface of plates
- B. Set bearing and leveling plates on wedges, shims, or leveling nuts. After bearing members have been positioned and plumbed, tighten anchor bolts. Do not remove wedges or shims but, if protruding, cut off flush with edge of bearing plate before packing with grout
 - 1. Use nonshrink nonmetallic grout in exposed locations unless otherwise indicated.
 - 2. Pack grout solidly between bearing surfaces and plates to ensure that no voids remain.

3.5 ADJUSTING AND CLEANING

- A. Touchup Painting: Immediately after erection, clean field welds, bolted connections, and abraded areas. Paint uncoated and abraded areas with the same material as used for shop painting to comply with SSPC-PA 1 for touching up shop-painted surfaces
 - 1. Apply by brush or spray to provide a minimum 2.0-mil dry film thickness.

END OF SECTION

SECTION 05510

METAL STAIRS

PART 1 – GENERAL

1.1 SECTION INCLUDES

- A. Structural steel stair framing and supports.
- B. Pan treads to receive concrete fill and shop cast concrete stair treads, and landings.
- C. Stairs with metal treads.
- D. Stairs with grating treads.
- E. Handrails and guards.

1.2 RELATED SECTIONS

- A. Section 03300 - Cast-In-Place Concrete: Concrete fill in stair pans and landings; mesh reinforcement for landings.
- B. Section 04810 - Unit Masonry Assemblies: Placement of metal anchors in masonry.
- C. Section 05500 - Metal Fabrications.
- D. Section 05520 - Handrails and Railings: Metal handrails and balusters other than specified in this section.

1.3 REFERENCES

- A. Unless otherwise noted the most current issue of the reference shall be used.
- B. ASTM A 6/A 6M – Standard Specification for General Requirements for rolled Structural Steel Bars, Shapes, and Sheet Piling.
- C. ASTM A 36/A 36M - Standard Specification for Carbon Structural Steel.
- D. ASTM A 53/A 53M – Standard Specification for Pipe Steel, Black and Hot-Dipped, Zinc-Coated, Welded, and seamless.
- E. ASTM A 123/A 123M – Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on iron and Steel Products.
- F. ASTM A 153/A 153M – Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware.
- G. ASTM A 283/A 283M - Standard Specification for Low and Intermediate Tensile Strength Carbon Steel Plates.
- H. ASTM A 307 – Standard Specification for Carbon Steel Bolts and Studs, 60,000 PSI Tensile Strength.
- I. ASTM A 325 - Standard Specification for Structural Bolts, Steel, Heat Treated, 120/105 ksi Minimum Tensile Strength.
- J. ASTM A 325M - Standard Specification for High-Strength Bolts for Structural Steel Joints (Metric).
- K. ASTM A 500 - Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes.
- L. ASTM A 501 – Standard Specification for Hot-Formed Welded and Seamless Carbon Steel Structural Tubing.
- M. ASTM A 653/A 653M – Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the hot-Dip Process.
- N. ASTM A 786/A 786M – Standard Specification for Hot-Rolled Carbon, low-Alloy, high-Strength Low-Alloy, and Alloy Steel Floor Plates.
- O. ASTM A 1008/A1008M – Standard Specification for Steel, Sheet, Cold-Rolled, Carbon, Structural, high-Strength, Low-Alloy, and High Strength Low-Alloy with Improved Formability, Solution Hardened, and Bake Hardenable.
- P. ASTM E 935 - Standard Test Methods for Performance of Permanent Metal Railing Systems and Rails for Buildings.
- Q. ASTM E 985 - Standard Specification for Permanent Metal Railing Systems and Rails for Buildings.
- R. ATBCB ADAAG – Americans with Disabilities Act Accessibility Guidelines.
- S. AWS A2.4 - Standard Symbols for Welding, Brazing, and Nondestructive Examination; American Welding Society; 1998.
- T. AWS D1.1 - Structural Welding Code - Steel; American Welding Society; 2002.

SECTION 05510

METAL STAIRS

- U. NAAMM AMP 510 - Metal Stairs Manual; The National Association of Architectural Metal Manufacturers.
- V. NAAMM AMP 510 – Metal Bar Grating manual; The National Association of Architectural Metal Manufacturers.
- W. NAAMM MBG 532 – Heavy Duty Metal Bar Grating manual.
- X. SSPC-Paint 15 - Steel Joist Shop Primer; Society for Protective Coatings.
- Y. SSPC-Paint 20 – Zinc-Rich Primers 9Type I, “Inorganic”, and Type II, “Organic”); Society for Protective Coatings.
- Z. SSPC-SP 2 - Hand Tool Cleaning; Society for Protective Coatings.

1.4 DESIGN REQUIREMENTS

- A. Design and fabricate stair assembly to support a uniform live load of 100 lb/sq ft and a concentrated load of 300 lb with deflection of stringer or landing framing not to exceed 1/180 of span.
- B. Design, fabricate, and test railing assemblies in accordance with the most stringent requirements of ASTM E 985 and applicable local code.
- C. Design railing assemblies, wall rails, and attachments to resist lateral force of 75 lbs at any point without damage or permanent set. Test in accordance with ASTM E 935.
- D. Fabricate metal stairs to comply with NAAMM AMP 510, Class Architectural.

1.5 SUBMITTALS

- A. See Section 01300 - Administrative Requirements, for submittal procedures.
- B. Shop Drawings: Indicate profiles, sizes, connection attachments, reinforcing, anchorage, size and type of fasteners, and accessories.
 - 1. Indicate welded connections using standard AWS A2.4 welding symbols. Indicate net weld lengths.
 - 2. Include the design engineer's stamp or seal on each sheet of shop drawings.
- C. Welders' Certifications.

1.6 QUALITY ASSURANCE

- A. Perform design and prepare shop drawings under direct supervision of a Professional Structural Engineer experienced in design of this work and licensed the State in which the Project is located.
- B. Welder Qualifications: Show certification of welders employed on the work, verifying AWS qualification within the previous 12 months.

PART 2 – PRODUCTS

2.1 METAL STAIRS – GENERAL

- A. Metal Stairs: Provide stairs of the design specified, complete with landing platforms, vertical and horizontal supports, railings, and guards, fabricated accurately for anchorage to each other and to building structure.
 - 1. Regulatory Requirements: Provide stairs and railings complying with the most stringent requirements of local, state, and federal regulations; where requirements of the contract documents exceed those of regulations, comply with the contract documents.
 - 2. Structural Design: provide complete stair and railing assemblies complying with the applicable local code.
 - 3. Dimensions: As indicated on drawings.
 - 4. Shop assemble components; disassemble into largest practical sections suitable for transport and access to site.
 - 5. No sharp or rough areas on exposed travel surfaces and surfaces accessible to the touch.
 - 6. Separate dissimilar metals using paint or permanent tape.

SECTION 05510

METAL STAIRS

- B. Metal jointing and Finish Quality Levels:
 - 1. Architectural: All joints as inconspicuous as possible, whether welded or mechanical.
 - a. Welded Joints: Continuously welded and ground smooth and flush.
 - b. Mechanical Joints: Butted tight, flush, and hairline; concealed fastening only.
 - c. Exposed Edges and Corners: Eased to small uniform radius.
 - d. Metal Surfaces to be painted: Sanded or ground smooth, suitable for highest quality gloss finish.
- C. Fasteners: Same material or compatible with materials being fastened; type consistent with design and specified quality level.
- D. Anchors and Related Components: Same material and finish as item to be anchored, except where specifically indicated otherwise; provide all anchors and fasteners required.

2.2 METAL STAIRS WITH CONCRETE TREADS

- A. Jointing and Finish Quality Level: Architectural; as defined above.
- B. Risers: Closed.
- C. Treads: Metal pan with field-installed concrete fill.
 - 1. Concrete Depth: 1-1/2 inches minimum.
 - 2. Tread Pan Material: Steel Sheet.
 - 3. Tread Pan Thickness: As required by design; 14 gage minimum.
 - 4. Pan Anchorage to Stringers: Continuously welded from top or bottom.
 - 5. Concrete Reinforcement: None.
 - 6. Concrete Finish: Steel trowel finish.
- D. Risers: Same material and thickness as tread pans.
 - 1. Riser/Nosing Profile: Sloped Riser with Rounded nosing of minimum radius.
 - 2. Nosing Depth: Not more than 1-1/2 inch overhang.
 - 3. Nosing Return: Flush with top of concrete fill; not more than 1/2 inch wide.
- E. Stringers: Rolled Steel Channels
 - 1. Stringer Depth: As required by design; 10 inches minimum.
 - 2. End Closure: Sheet Steel of same thickness as risers welded across ends.
- F. Landings: Same construction as treads; supported and reinforced as required to achieve design load capacity.
- G. Railings: Steel Pipe Railings; Refer to Section 05520.
- H. Finish: Shop or factory prime finish.
- I. Finish: Galvanized after fabrication, except sheet components are to be galvanized before fabrication.
- J. Underside of Stair: Exposed to view, to be finished same as specified for other exposed to view surfaces.

2.3 METAL STAIRS WITH METAL TREADS

- A. Jointing and Finish Quality Level: Architectural; as defined above.
- B. Risers: Closed.
- C. Treads: Checkered steel plate.
 - 1. Tread Thickness: 1/4 inch minimum.
 - 2. Anchorage to Stringers: Welded or bolted to carrier angles welded or bolted to stringers.
- D. Risers: Steel Sheet.
 - 1. Riser Thickness: As required by design; 14 gage minimum.
 - 2. Riser/Nosing Profile: Sloped riser with rounded nosing of minimum radius.
- E. Stringers: Rolled Steel Channels
 - 1. Stringer Depth: As required by design; 10 inches minimum.
 - 2. End Closure: Sheet Steel of same thickness as risers welded across ends.
- F. Landings: Same construction as treads; supported and reinforced as required to achieve design load capacity.
- G. Railings: Steel Pipe Railings; Refer to Section 05520.
- H. Finish: Shop or factory prime finish.

SECTION 05510

METAL STAIRS

- I. Finish: Galvanized after fabrication, except sheet components are to be galvanized before fabrication.
- J. Underside of Stair: Exposed to view, to be finished same as specified for other exposed to view surfaces.

2.4 METAL STAIRS WITH GRATING TREADS

- A. Jointing and Finish Quality Level: Architectural; as defined above.
- B. Risers: Open.
- C. Treads: Steel bar grating.
 - 1. Grating Type: Welded.
 - 2. Bearing Bar Depth: 3/4 inch minimum.
 - 3. Top Surface: Standard.
 - 4. Nosing: Checkered Plate.
 - 5. Nosing Width: 1-1/4 inch minimum.
 - 6. Anchorage to Stringers: End plates welded to grating, bolted to stringers.
- D. Stringers: Rolled Steel Channels
 - 1. Stringer Depth: As required by design; 10 inches minimum.
 - 2. End Closure: Sheet Steel of same thickness as risers welded across ends.
- E. Landings: Same construction as treads; supported and reinforced as required to achieve design load capacity.
- F. Railings: Steel Pipe Railings; Refer to Section 05520.
- G. Finish: Shop or factory prime finish.
- H. Finish: Galvanized after fabrication, except sheet components are to be galvanized before fabrication.
- I. Underside of Stair: Exposed to view, to be finished same as specified for other exposed to view surfaces.

2.5 HANDRAILS AND GUARDS

- A. Wall-mounted Rails: As specified in Section 05520.
- B. Guards: Pipe railings as specified in Section 05520.

2.6 MATERIALS

- A. Steel Sections: ASTM A 36/A 36M.
- B. Steel Tubing: ASTM A 500, Grade B cold-formed structural tubing.
- C. Steel Plates: ASTM A 283.
- D. Pipe: ASTM A 53/A 53M, Grade B Schedule 40, black finish.
- E. Ungalvanized Steel Sheet: Hot- or cold-rolled, unless otherwise indicated.
 - 1. Hot-Rolled Steel Sheet: ASTM A 1011/A 1011M, Designation CS (commercial steel).
 - 2. Cold-Rolled Steel Sheet: ASTM A 1008/A 1008M, Designation CS (commercial steel).
- F. Galvanized Steel Sheet: ASTM A 653/A 653M, Structural Steel (SS) Grade 33/230 with G40/Z120 coating.
- G. Checkered Plate: ASTM A 786/A 786M, rolled steel floor plate; pattern no. 2.
- H. Gratings: Bar gratings complying with NAAMM MBG 531 or NAAMM MBG 532, whichever applies based on bar sizes.
- I. Concrete Fill: Portland cement Type I, 3000 psi (20 MPa) 28 day strength, 2 to 3 inch (50 to 75 mm) slump.
- J. Bolts, Nuts, and Washers: ASTM A 325 (ASTM A 325M), Type 1, galvanized to ASTM A 153/A 153M where connecting galvanized components.
- K. Exposed Mechanical Fastenings: Flush countersunk screws or bolts; consistent with design of stair structure.
- L. Welding Materials: AWS D1.1; type required for materials being welded.
- M. Shop and Touch-Up Primer: SSPC-Paint 15, complying with VOC limitations of authorities having jurisdiction.
- N. Touch-Up Primer for Galvanized Surfaces: SSPC-Paint 20, Type I - Inorganic, complying with VOC limitations of authorities having jurisdiction.

SECTION 05510

METAL STAIRS

2.7 FINISHING

- A. Prepare surfaces to be primed in accordance with SSPC-SP 2.
- B. Clean surfaces of rust, scale, grease, and foreign matter prior to finishing.
- C. Do not prime surfaces in direct contact with concrete or where field welding is required.
- D. Prime Paint: Use specified shop- and touch-up primer.
 - 1. Preparation of Steel: In accordance with SSPC-SP 2, Hand Tool Cleaning.
 - 2. Number of Coats: One.
- E. Galvanizing: Hot-dip galvanize to minimum requirements of ASTM A 123/A 123M.
 - 1. Touch up abraded areas after fabrication using specified touch-up primer for galvanized surfaces.

PART 3 – EXECUTION

3.1 EXAMINATION

- A. Verify that field conditions are acceptable and are ready to receive work.

3.2 PREPARATION

- A. Clean and strip primed steel items to bare metal where site welding is required.

3.3 INSTALLATION

- A. Install components plumb and level, accurately fitted, free from distortion or defects.
- B. Provide anchors, plates, angles, hangers, and struts required for connecting stairs to structure.
- C. Allow for erection loads, and for sufficient temporary bracing to maintain true alignment until completion of erection and installation of permanent attachments.
- D. Field weld components indicated on drawings. Perform field welding in accordance with AWS D1.1.
- E. After erection, prime welds, abrasions, and surfaces not shop primed, except surfaces to be in contact with concrete.

3.4 ERECTION TOLERANCES

- A. Maximum Variation From Plumb: 1/4 inch per story, non-cumulative.
- B. Maximum Offset From True Alignment: 1/4 inch.

3.5 SCHEDULE

- A. Stair #100: Stair with concrete treads.
- B. Stair #101: Stair with grating treads.

END OF SECTION

SECTION 05520

HANDRAILS AND RAILINGS

PART 1 – GENERAL

1.1 SECTION INCLUDES

- A. Steel handrails, balusters, and fittings.

1.2 RELATED SECTIONS

- A. Section 04810 - Unit Masonry Assemblies: Placement of anchors in masonry.
- B. Section 05510 - Metal Stairs: Handrails other than those specified in this section.
- C. Section 09900 – Paints and Coatings: Paint Finish.

1.3 REFERENCES

- A. Unless otherwise noted the most current issue of the reference shall be used.
- B. ASTM A 500 - Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes.
- C. ASTM E 935 - Standard Test Methods for Performance of Permanent Metal Railing Systems and Rails for Buildings.
- D. SSPC-Paint 15 - Steel Joist Shop Paint; The Society for Protective Coatings.

1.4 DESIGN REQUIREMENTS

- A. Design railing assembly, wall rails, and attachments to resist lateral force of 200 lbs at any point without damage or permanent set. Test in accordance with ASTM E 935.

1.5 SUBMITTALS

- A. See Section 01300 - Administrative Requirements, for submittal procedures.
- B. Shop Drawings: Indicate profiles, sizes, connection attachments, anchorage, size and type of fasteners, and accessories.

PART 2 – PRODUCTS

2.1 STEEL RAILING SYSTEM

- A. Steel Tubing: ASTM A 500, Grade B cold-formed structural tubing.
- B. Fittings: Elbows, T-shapes, wall brackets, escutcheons; cast steel.
- C. Mounting: Adjustable Brackets and flanges, with steel inserts for casting in concrete. Prepare backing plate for mounting in gypsum drywall wall construction.
- D. Exposed Fasteners: Flush countersunk screws or bolts; consistent with design of railing.
- E. Splice Connectors: Steel concealed spigots.
- F. Shop and Touch-Up Primer: SSPC-Paint 15, complying with VOC limitations of authorities having jurisdiction.

2.2 FINISHES - STEEL

- A. Prime paint all interior steel items. Galvanize and paint all steel exposed to the exterior.
 - 1. Exceptions: Galvanize items to be embedded in concrete or masonry.
 - 2. Exceptions: Do not prime surfaces in direct contact with concrete and where field welding is required.
- B. Prepare surfaces to be primed in accordance with SSPC-SP2.
- C. Clean surfaces of rust, scale, grease, mud and foreign matter prior to finishing.
- D. Prime Painting: Two coats.
- E. Galvanizing of Steel Members: Galvanize after fabrication to ASTM A 123/A 123M. Provide minimum 1.7 oz/sq ft galvanized coating.
- F. Galvanizing of Non-structural Items: Galvanize after fabrication to ASTM A 123/A 123M requirements.

SECTION 05520

HANDRAILS AND RAILINGS

2.3 FABRICATION

- A. Fit and shop assemble components in largest practical sizes for delivery to site.
- B. Fabricate components with joints tightly fitted and secured. Provide spigots and sleeves to accommodate site assembly and installation.
- C. Provide anchors and plates required for connecting railings to structure.
- D. Exposed Mechanical Fastenings: Provide flush countersunk screws or bolts; unobtrusively located; consistent with design of component, except where specifically noted otherwise.
- E. Supply components required for anchorage of fabrications. Fabricate anchors and related components of same material and finish as fabrication, except where specifically noted otherwise.
- F. Interior Components: Continuously seal joined pieces by continuous welds.
- G. Grind exposed joints flush and smooth with adjacent finish surface. Make exposed joints butt tight, flush, and hairline. Ease exposed edges to small uniform radius.
- H. Accurately form components to suit specific project conditions and for proper connection to building structure.
- I. Accommodate for expansion and contraction of members and building movement without damage to connections or members.

PART 3 – EXECUTION

3.1 EXAMINATION

- A. Verify that field conditions are acceptable and are ready to receive work.

3.2 PREPARATION

- A. Clean and strip primed steel items to bare metal where site welding is required.
- B. Supply items required to be cast into concrete or embedded in masonry with setting templates, for installation as work of other sections.

3.3 INSTALLATION

- A. Install in accordance with manufacturer's instructions.
- B. Install components plumb and level, accurately fitted, free from distortion or defects.
- C. Anchor railings securely to structure.
- D. Assemble with spigots and sleeves to accommodate tight joints and secure installation.

3.4 ERECTION TOLERANCES

- A. Maximum Variation From Plumb: 1/4 inch per floor level, non-cumulative.
- B. Maximum Offset From True Alignment: 1/4 inch.
- C. Maximum Out-of-Position: 1/4 inch.

END OF SECTION

SECTION 05560

ARCHITECTURAL METAL COLUMN COVERS

PART 1 – GENERAL

1.1 SECTION INCLUDES

- A. Furnish all material necessary for a complete installation of column covers, exclusive of field applied material (i.e. joint compound, substructure, etc.).

1.2 SUBMITTALS

- A. Submit complete shop drawings detailing quantities, sizes, finish, configurations, and column attachment methods.
- B. Submit product literature, specifications, information, and installation instructions.

1.3 QUALITY ASSURANCE

- A. Manufacturer to have a minimum of ten years' experience in the manufacturing of column covers.
- B. Manufacturer to inspect all aspects of the product to ensure that specifications have been met, and that they comply with approved shop drawings.
- C. Manufacturer shall issue a one year limited warranty ensuring product against defects in workmanship and materials.

PART 2 – PRODUCTS

2.1 MANUFACTURERS

- A. Basis of Design: Pac-Clad, Petersen Aluminum; <https://www.pac-clad.com>.
 - 1. PAC-1000F Column Covers.
 - 2. Substitutions: Refer to Section 01600 - Product Requirements.

2.2 COLUMN COVERS

- A. Column Cover 1:
 - 1. Size: As indicated on drawings.
 - 2. Color: To be selected from Manufacturer's full line of anodized aluminum finishes.
- B. Column Cover 2:
 - 1. Size: As indicated on drawings.
 - 2. Color: To be selected from Manufacturer's full line of anodized aluminum finishes.

2.3 MATERIALS

- A. Column covers shall be roll-formed anodized aluminum in .090" thickness.
- B. All fasteners are to be concealed.
- C. All column covers are to be shipped with protective material on all exposed surfaces.

2.4 FABRICATION

- A. Column covers shall be roll-formed to specific dimensions and tolerances, and accurately formed to radii shown on drawings.
- B. Column covers shall be fabricated in two vertically divided sections with attachment provided through bent back installation fins.

SECTION 05560

ARCHITECTURAL METAL COLUMN COVERS

PART 3 – EXECUTION

3.1 EXAMINATION

- A. Contractor to inspect column covers upon receipt to ensure that no damage has occurred during shipment.
- B. Verify that field conditions are acceptable and are ready to receive work.

3.2 INSTALLATION

- A. Column cover to be correctly oriented and installed in accordance with manufacturer's shop drawings and installation instructions to ensure proper installation.
- B. Install components plumb and level, accurately fitted, and free from distortion or defects.

3.3 CLEANING AND PROTECTION

- A. Contractor to remove protective material supplied by column cover manufacturer.
- B. Contractor to clean all visible surfaces after installation.
- C. Contractor to protect column covers from damage by other trades

END OF SECTION

SECTION 05700

DECORATIVE METAL

PART 1 – GENERAL

1.1 SUMMARY

- A. This Section includes Decorative Metal as shown on drawings and schedules
- B. Drawings and general provisions of the Contract Documents apply to work of this section.

1.2 SUBMITTALS

- A. Shop drawings indicating quantities, dimensions, finishes, and attachment details.
- B. Product literature and samples for each color, pattern, and finish as indicated.

1.3 QUALITY ASSURANCE

- A. Manufacturer shall have a minimum of 5 years experience in manufacturing decorative metals for commercial use.

1.4 DELIVERY, STORAGE, AND HANDLING

- A. Deliver materials to the project site in manufacturer's original packaging, properly labeled for identification and installation purposes.
- B. Store in location to avoid damage from job-site traffic, direct sunlight, moisture, stacking or other job-site contaminants. Store in a completely supported flat position. Edge storage is not recommended.
- C. Handle components to avoid denting or scratching of finished surfaces.
- D. DO NOT use markers on protective PVC film. Some types of ink will permeate the film and mark the material surface.

1.5 PROJECT CONDITIONS

- A. Maintain a constant temperature range of 65°F to 85°F (18°C to 24°C), with stable relative humidity, for at least 48 hours prior to, throughout the installation period and maintained consistently thereafter.
- B. Installation locations must be enclosed, weatherproofed and climate controlled prior to commencing installation.
- C. Do not install if relative humidity is greater than 80%.

1.6 WARRANTY

- A. Provide manufacturer's warranty against defects in material and workmanship.

PART 2 – PRODUCTS (DMP-1)

2.1 MANUFACTURER

- A. Manufacturers: All products by the same manufacturer.
 - 1. Basis of Design: Móz Designs, Inc., 711 Kevin Court, Oakland, CA 94621, Phone 510-632-0853, Fax 510-632-0852, Email: estimating@mozdesigns.com
- B. Substitutions: See Section 01600 - Product Requirements.

2.2 METALS

- A. Laser Cut Aluminum 'Moz Metals'
 - 1. 3/16" thick Aluminum: Type 5052 alloy complying with ASTM B209
 - 2. Sizes: 4'x8' standard size
 - 3. Flight Series (panels A,B, & C)
 - 4. Powder White Sand
 - 5. Finish: Powder coat
 - 6. Custom Options
 - a. Double Side Finish: Y

SECTION 05700

DECORATIVE METAL

PART 3 – EXECUTION

3.1 EXAMINATION

- A. Examine product, substrates and installation conditions.
- B. Notify the contractor and architect in writing of any conditions detrimental to the proper and timely completion of the installation.
- C. Do not proceed with work until conditions have been corrected.

3.2 SURFACE PREPARATION

- A. Prior to installation, clean surface to remove dirt, debris and loose particles. Perform additional preparation procedures as required per the manufacturer's instructions.
- B. Protection: Take all necessary precautions to prevent damage to materials during installation.

3.3 INSTALLATION

- A. Install the work of this section in strict accordance with manufacturers written Technical Information and workability guidelines.
- B. Refer to Architectural drawings for layout and other hardware required for installation.

3.4 CLEANING

- A. Remove protective coverings and clean decorative metal to remove adhesives and tape residue. Test all solvents on non-exposed surfaces prior to use.
 - 1. For painted surfaces, use a mild detergent solution on a soft cloth.
 - 2. For stainless steel, use a glass cleaner and a soft cloth.
 - 3. For other surfaces, contact manufacturer for proper cleaning procedures.
 - 4. For HEAVY CLEANING and removal of grease, use oil based mineral spirits or naphtha. Low concentration ammonia based cleaning agents such as glass cleaners may also be used.
 - 5. Minor scuffs can be polished out by hand with a #6 to #9 type finishing polish or wax.
 - 6. DO NOT treat with rubbing compounds or lacquer thinner as this may dissolve or etch the coating.
- B. Visually inspect all exposed surfaces for scratches or blemishes.
- C. Protect Decorative Metal from damage during remainder of construction period.

END OF SECTION

SECTION 06071

PRESSURE-TREATED WOOD PRODUCTS

PART 1 – GENERAL

1.1 SECTION INCLUDES

- A. Preservative treatment of lumber and plywood.
- B. Fire-retardant treatment of lumber and plywood.

1.2 RELATED SECTIONS

- A. Section 06100 - Rough Carpentry.
- B. Section 06200 - Finish Carpentry.

1.3 REFERENCES

- A. Unless otherwise noted the most current issue of the reference shall be used.
- B. AFPA T06 - Permanent Wood Foundation System: Design, Fabrication, Installation Manual; American Forest and Paper Association.
- C. AFPA T. R. No. 7 - Permanent Wood Foundation System; American Forest and Paper Association.
- D. ASTM A 153/A 153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron And Steel Hardware.
- E. AWPA C2 - Lumber, Timber, Bridge Ties and Mine Ties -- Preservative Treatment by Pressure Processes; American Wood-Preservers' Association.
- F. AWPA C20 - Structural Lumber -- Fire-Retardant Treatment by Pressure Processes; American Wood-Preservers' Association.
- G. AWPA C22 - Lumber and Plywood for Permanent Wood Foundations -- Preservative Treatment by Pressure Processes; American Wood-Preservers' Association.
- H. AWPA C27 - Plywood -- Fire-Retardant Treatment by Pressure Processes; American Wood-Preservers' Association.

1.4 SUBMITTALS

- A. See Section 01300 - Administrative Requirements, for submittal procedures.
- B. Product Data: Treating plant's instructions for use, including requirements for storage, cutting, and finishing.
- C. Preservative Treatment Certification: Treating plant's certification of compliance with specified standards, process employed, and preservative retention values.
- D. Fire-Retardant Treatment Certification: Treating plant's certification of compliance with specified requirements.

1.5 QUALITY ASSURANCE

- A. Fire-Retardant Treatment: Mark each piece of plywood and lumber to show compliance with specified standards.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Protect wood products against moisture and dimensional changes, in accordance with instructions from treating plant.

1.7 WARRANTY

- A. See Section 01780 - Closeout Submittals, for additional warranty requirements.
- B. Fire-Retardant Treated Wood: Provide manufacturer's standard 20-year limited warranty.
- C. Preservative-Treated Wood: Provide manufacturer's standard 50-year limited warranty.
- D. Preservative-Treated Wood: Provide manufacturer's standard lifetime warranty.

SECTION 06071

PRESSURE-TREATED WOOD PRODUCTS

PART 2 – PRODUCTS

2.1 MANUFACTURERS

- A. Provide wood treatment by or under license from Chemical Specialties, Inc., One Woodlawn Green, Suite 250, 200 E. Woodlawn Road, Charlotte, NC 28217. ASD. Tel: (800) 421-8661.
- B. Substitutions: See Section 01600 - Product Requirements.

2.2 MATERIALS

- A. Dimension Lumber: As specified in Section 06100.
- B. Structural Plywood: As specified in Section 06100.
- C. Finish Lumber and Plywood: As specified in Section 06200.
- D. Fasteners: For treated wood and where wood is in ground contact, subject to high relative humidity, or exposed to weather, provide steel fasteners with hot-dip zinc coating per ASTM A 153/A 153M.

2.3 PRESSURE TREATMENT OF WOOD

- A. Preservative Treatment for Above Ground Use:
 1. Treatment: ACQ(R) Preserve(R).
 2. Use 0.25 lb/cu ft retention.
 3. Kiln dry after treatment to 19 percent maximum moisture content for lumber and 18 percent for plywood.
 4. Treat wood in the following locations:
 - a. In contact with roofing, flashing, or waterproofing.
 - b. In contact with masonry or concrete.
 - c. Within 18 inches of grade.
 - d. Exposed to weather.
 - e. Other locations indicated.
- B. Preservative Treatment for Ground and Fresh Water Contact:
 1. Treatment: ACQ(R) Preserve(R).
 2. Use 0.40 lb/cu ft retention, unless otherwise indicated.
 3. Utility Poles: Use 0.60lb/cu ft retention.
 4. Pilings: Use 0.80 to 1.0 lb/cu ft retention, per AWPA Standards.
 5. Salt Water Marine Pilings: Use 2.50 lbs/cu ft retention.
 6. Kiln dry after treatment to 19 percent maximum moisture content for lumber and 18 percent for plywood.
 7. Treat wood in the following locations:
 - a. In contact with ground.
 - b. In contact with fresh water.
 - c. Used as posts, landscaping timbers, retaining walls, piers, or docks.
- C. Preservative Treatment for Wood Foundation Systems:
 1. Pressure-treat softwood lumber, timber, and plywood for wood foundation systems with waterborne preservatives to comply with AWPA C22.
 2. Treatment: ACQ(R) Preserve(R).
 3. Use 0.60 lb/cu ft retention.
- D. Fire-Retardant Treatment:
 1. Lumber: Comply with AWPA C20.
 2. Plywood: Comply with AWPA C27, Type A.
 3. Surface Burning Characteristics: UL FRS rating; flame spread and smoke developed ratings of 25 or less in a test of 30 minutes' duration.
 4. Treatment: D-Blaze(R).

SECTION 06071

PRESSURE-TREATED WOOD PRODUCTS

5. Treat wood used for the following applications:
 - a. Roof and floor trusses.
 - b. Roof decks and sheathing.
 - c. Subflooring.
 - d. Beams and purlins.
 - e. Millwork and trim.

PART 3 – EXECUTION

3.1 INSTALLATION

- A. Framing and Sheathing: Comply with installation requirements in Section 06100.
- B. Millwork and Trim: Comply with installation requirements in Section 06200.
- C. Fire-Retardant Treated Wood: End cuts and drilling are permitted. Do not rip or mill lumber or plywood after fire-retardant treatment.
- D. Wood Foundation System: Install in accordance with the following:
 1. AFPA Technical Report No. 7.
 2. APA Form A400.

END OF SECTION

SECTION 06100

ROUGH CARPENTRY

PART 1 – GENERAL

1.1 SECTION INCLUDES

- A. Structural floor, wall, and roof framing.
- B. Floor, wall, and roof sheathing.
- C. Preservative treatment of wood.
- D. Fire retardant treatment of wood.
- E. Miscellaneous framing and sheathing.
- F. Engineered Lumber
- G. Telephone and electrical panel boards.
- H. Wood nailers and curbs for roofing and items installed on roof.
- I. Concealed wood blocking for support of toilet and bath accessories, wall cabinets, and wood trim.
- J. Miscellaneous wood nailers and furring strips.

1.2 RELATED SECTIONS

- A. Section 05500 - Metal Fabrications: Miscellaneous steel connectors and support angles for wood framing.
- B. Section 06114 - Wood Blocking and Curbing
- C. Section 07620 - Sheet Metal Flashing and Trim
- D. Section 09260 - Gypsum Board Assemblies

1.3 REFERENCES

- A. Unless otherwise noted the most current issue of the reference shall be used.
- B. AFPA T10 - Wood Frame Construction Manual; American Forest and Paper Association.
- C. AWPA C2 - Lumber, Timber, Bridge Ties and Mine Ties -- Preservative Treatment by Pressure Processes; American Wood-Preservers' Association.
- D. AWPA C20 - Structural Lumber -- Fire Retardant Treatment by Pressure Processes; American Wood-Preservers' Association.
- E. PS 1 - Construction and Industrial Plywood; National Institute of Standards and Technology (Department of Commerce).
- F. PS 20 - American Softwood Lumber Standard; National Institute of Standards and Technology (Department of Commerce).
- G. PRI - 400 - Performance for APA EWS I-Joists; The Engineered Wood Association.
- H. PRL-501 - Performance Standard for APA EWS Laminated Veneer Lumber; The Engineered Wood Association.
- I. F405 - APA Performance Rated Panels; The Engineered Wood Association.
- J. WWPA G-5 - Western Lumber Grading Rules; Western Wood Products Association.

1.4 SUBMITTALS

- A. See Section 01300 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide technical data on wood preservative materials and application instructions.
- C. Samples: For rough carpentry members that will be exposed to view, submit two samples 12 inches in size illustrating wood grain, color, and general appearance.
- D. Manufacturer's Certificate: Certify that wood products supplied for rough carpentry meet or exceed specified requirements.

1.5 QUALITY ASSURANCE

- A. Lumber: Comply with PS 20 and approved grading rules and inspection agencies.
- B. Do not use split, warped, twisted or otherwise damaged or unacceptable members. All such members shall be removed from the site at the discretion of the Architect.
- C. Do not use moisture damaged materials. All such materials shall be removed from the site at the discretion of the Architect.

SECTION 06100

ROUGH CARPENTRY

1.6 QUALIFICATIONS

- A. Design structural site fabricated trusses under direct supervision of a Professional Structural Engineer experienced in design of such trusses and licensed in the State in which the Project is located.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Cover wood products to protect against moisture. Support stacked products to prevent deformation and to allow air circulation.
- B. Protect site fabricated trusses from warping or other distortion by stacking in vertical position, braced to resist movement.

PART 2 – PRODUCTS

2.1 SECTION INCLUDES

- A. Grading Agency: Western Wood Products Association (WWPA).
- B. Sizes: Nominal sizes as indicated on drawings, S4S.
- C. Moisture Content: S-dry or MC19.
- D. Stud Framing (2 x 2 through 2 x 6):
 - 1. Species: Douglas Fir-Larch.
 - 2. Grade: Select Structural.
- E. Joist, Rafter, and Small Beam Framing (2 x 6 through 4 x 16):
 - 1. Machine stress-rated (MSR) as follows:
 - a. Fb-single (minimum extreme fiber stress in bending): 1350 psi.
 - b. E (minimum modulus of elasticity): 1,300,000 psi.
 - 2. Species: Douglas Fir-Larch.
- F. Miscellaneous Blocking, Furring, and Nailers:
 - 1. Lumber: S4S, No. 2 or Standard Grade.

2.2 ENGINEERED LUMBER

- A. Laminated Veneer Lumber (LVL):
 - 1. Structural members manufactured using wood veneers bonded together using exterior exposure adhesives. LVL members shall meet or exceed the requirements of PRL-501.
 - 2. Sizes: As indicated on drawings.
 - 3. Accessories: Hangers, plates and other items as manufactured and recommended by LVL manufacturer for condition and loading unless otherwise noted.
 - 4. Manufacturers:
 - a. Truss Joist: www.tjm.com
 - b. Georgia Pacific: www.gp.com
 - c. Roseburg Forest Products: www.rfpco.com
 - d. International Paper Company: www.internationalpaper.com
 - e. Substitutions: See Section 01600 - Product Requirements.
- B. Performance Rated I-Joists:
 - 1. "I" shaped structural members prefabricated using sawn or composite lumber flanges and structural use panel webs bonded together using exterior exposure adhesives meeting an L/480 live load deflection criterion. All I-Joists shall meet or exceed the requirements of PRI-400.
 - 2. Sizes: As indicated on drawings.
 - 3. Accessories: Joist hangers, rim joists, blocking material and other items as manufactured and recommended by Joist manufacturer for condition and loading unless otherwise noted.
 - 4. Manufacturers:
 - a. Truss Joist: www.tjm.com
 - b. Georgia Pacific: www.gp.com
 - c. Roseburg Forest Products: www.rfpco.com

SECTION 06100

ROUGH CARPENTRY

- d. International Paper Company: www.internationalpaper.com
- e. Substitutions: See Section 01600 - Product Requirements.

2.3 EXPOSED DIMENSION LUMBER

- A. Grading Agency: Western Wood Products Association (WWPA).
- B. Sizes: Nominal sizes as indicated on drawings, S4S.
- C. Moisture Content: S-dry or MC19.
- D. Stud Framing (2 x 2 through 2 x 6):
 - 1. Species: Douglas Fir covered as shown in drawings.
 - 2. Grade: Select Structural.
- E. Joist, Rafter, and Small Beam Framing (2 x 6 through 4 x 16):
 - 1. Species: Douglas Fir.
 - 2. Grade: Select Structural covered as shown in drawings.

2.4 TIMBERS

- A. Grading Agency: Western Wood Products Association (WWPA).
- B. Sizes: Nominal sizes as indicated on drawings, S4S.
- C. Moisture Content: S-dry (19 percent maximum).
- D. Beams and Posts 5 inches and over in thickness:
 - 1. Species: Douglas Fir.
 - 2. Grade: Select Structural.

2.5 EXPOSED BOARDS

- A. Moisture Content: Kiln-dry (15 percent maximum).
- B. Surfacing: S4S.
- C. Species: Douglas Fir.
- D. Grade: No. 2, 2 Common, or Construction.

2.6 CONSTRUCTION PANELS

- A. Sub-floor/Underlayment Combination: APA Rated OSB Stud-I-Floor.
 - 1. Exposure Class: Exposure 1.
 - 2. Span Rating: 16 inches.
 - 3. Thickness: 3/4 inches, nominal.
- B. APA Rated OSB Sub-flooring:
 - 1. Exposure Class: 1.
 - 2. Span Rating: 32/16 inches.
- C. Plywood Sub-flooring: PS 1, Grade C-D, Exposure I.
 - 1. Size: Nominal 3/4 inch in 4 foot by 8 foot sheets.
- D. APA Rated OSB Roof Sheathing: Exposure 1, and as follows:
 - 1. Structural I.
 - 2. Span Rating: 24/16.
- E. Plywood Roof Sheathing: PS 1, Grade C-D, Exposure I.
 - 1. Size: 3/4 inch nominal thickness in 4 foot by 8 foot sheets.
- F. FAPA Rated OSB Wall Sheathing: Exposure 1, and as follows:
 - 1. Structural I.
 - 2. Span Rating: 24/16.
- G. Plywood Wall Sheathing: PS 1, Grade C-D, Exposure I.
 - 1. Size: Nominal 1/2 inch in 4 foot by 8 foot sheets.
- H. Miscellaneous Panels:
 - 1. Concealed Plywood: PS 1, C-C Plugged, exterior grade.
 - 2. Exposed Plywood: PS 1, A-D, interior grade.
 - 3. Electrical Component Mounting: APA rated sheathing, fire retardant treated.

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2.7 ACCESSORIES

- A. Fasteners and Anchors:
 - 1. Fasteners: Hot-dipped galvanized steel for high humidity and treated wood locations, unfinished steel elsewhere.
 - 2. Drywall Screws: Bugle head, hardened steel, power driven type, length three times thickness of sheathing.
 - 3. Anchors: Expansion shield and lag bolt type for anchorage to solid masonry or concrete.
- B. Joist Hangers: Hot dipped galvanized steel, sized to suit framing conditions.
- C. Sill Gasket on Top of Foundation Wall: 1/4 inch thick, plate width, closed cell plastic foam from continuous rolls.
- D. Sill Flashing: As specified in Section 07620.
- E. Subfloor Glue: Waterproof, water base, air cure type, cartridge dispensed.
- F. Building Paper: No. 30 asphalt felt.
- G. Termite Shield: copper.

2.8 FACTORY WOOD TREATMENT

- A. Fire Retardant Treatment: AWWA Treatment C20, Interior Type A Low Temperature (low hygroscopic), chemical treatment pressure impregnated; capable of providing a maximum flame spread/smoke development rating of 25 / 450.
- B. Pressure Treatment of Lumber Above Grade: AWWA Treatment C2 using waterborne preservative to 0.25 lb/cu ft retention.
 - 1. Kiln dry after treatment to maximum moisture content of 19 percent.
 - 2. Treat wood in contact with roofing, flashing, or waterproofing.
 - 3. Treat wood in contact with masonry or concrete.
 - 4. Treat wood less than 18 inches above grade.
- C. Pressure Treatment of Lumber in Contact with Soil: AWWA Treatment C2 using waterborne preservative designated in AWWA C2 as suitable for ground contact use to 0.4 lb/cu ft retention.

PART 3 – EXECUTION

3.1 FRAMING INSTALLATION

- A. All framing shall be Platform type as put forth in AFPA T10- Balloon Framing is not permissible.
- B. Unless otherwise noted, all framing members shall be spaced at 16 inch on center intervals and secured with a minimum of five 10d toenails or screws at the end of each member.
- C. Install all framing members in compliance with detailing presented in AFPA T10 - Wood Frame Construction Manual- unless exceeded herein.
- D. Set structural members level, plumb, and true to line. Discard pieces with defects that would lower required strength or result in unacceptable appearance of exposed members.
- E. Make provisions for temporary construction loads, and provide temporary bracing sufficient to maintain structure in true alignment and safe condition until completion of erection and installation of permanent bracing.
- F. Install structural members full length without splices unless otherwise specifically detailed.
- G. Install horizontal spanning members with crown edge up and not less than 1-1/2 inches of bearing at each end.
- H. Construct double joist headers at floor and ceiling openings and under wall stud partitions that are parallel to floor joists; use metal joist hangers unless otherwise detailed and comply with fasteners listed above.
- I. Provide solid blocking at all joists and other framing in excess of 8 feet span. Provide solid blocking at 8 feet on center across all floor joists. Fit solid blocking at ends of joists over all supporting members.
- J. Provide continuous double 2 inch by 4 inch stiffeners over all ceiling joists at 8 foot centers or at mid span for members less than 16 feet. Stiffeners shall be constructed of one flat 2 inch by 4 inch member, with one 2 inch by 4 inch member on edge and nailed to flat member and joists on 16 inch centers.

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- K. Provide solid blocking at framing in excess of 8 feet span and as detailed. Fit solid blocking at ends of members.
- L. Fire blocking: install solid fire blocking of identical sized material to studs or joists between floors where balloon framing is encountered and over all supporting girders or beams.
- M. Frame openings with two studs at each jamb for openings not exceeding 4 foot; Frame openings with three studs at each jamb for openings from 4 foot to 8 foot; Frame openings with 5 studs at each jamb for openings exceeding 8 foot; support headers on cripple studs at each end and at center to center spacing.
- N. Provide miscellaneous members as indicated or as required to support finishes, fixtures, specialty items, and trim.

3.2 INSTALLATION OF ACCESSORIES AND MISCELLANEOUS WOOD

- A. Place full width continuous sill flashings or termite shield under framed walls over sill gasket. Lap flashing joints 4 inches and seal.
- B. Place sill gasket directly on cementitious foundation. Puncture gasket cleanly and fit tightly to protruding foundation anchor bolts.
- C. Coordinate installation of LVL beams, wood decking, wood chord metal joists, glue laminated structural units, prefabricated wood trusses, and plywood web joists.
- D. Install I-joists in compliance with manufacturer's recommended procedures unless exceeded herein. Provide continuous rim joists at outer edges of all joists both parallel and perpendicular to joists.
- E. Curb roof openings except where prefabricated curbs are provided. Form corners by alternating lapping side members.
- F. Coordinate curb installation with installation of decking and support of deck openings.
- G. See Section 06114 for installation of wood blocking and curbing for roof applications.

3.3 INSTALLATION OF CONSTRUCTION PANELS

- A. Install telephone and electrical panel back boards made of plywood or other acceptable structural panels at locations indicated. Size back boards to be minimum 6 inches beyond size of telephone and electrical panels.
- B. Sub-flooring/Underlayment Combination: Glue and nail to framing using minimum 2 1/2 inch long nails; staples are not permitted.
- C. Sub-flooring: Glue and nail to framing using minimum 2 1/2 inch long nails; staples are not permitted.
- D. Underlayment: Secure to sub-flooring with nails and glue.
 - 1. At locations where resilient flooring will be installed, fill and sand splits, gaps, and rough areas.
 - 2. Place building paper between floor underlayment and sub-flooring.
- E. Roof Sheathing: Secure panels perpendicular to framing members, with ends staggered and sheet ends over firm bearing.
 - 1. Use sheathing clips between roof framing members.
 - 2. Provide solid edge blocking between sheets.
 - 3. Screw panels to framing with galvanized screws; staples are not permitted.
- F. Wall Sheathing: Secure with long dimension perpendicular to wall studs, with ends over firm bearing and staggered, using nails or screws of minimum 2 inch length.
 - 1. Use plywood at building corners, for not less than 96 inches, measured horizontally.
 - 2. Place building paper horizontally over wall sheathing, weather lapping edges and ends.

3.4 SITE APPLIED WOOD TREATMENT

- A. Apply preservative treatment compatible with factory applied treatment at site-sawn cuts, complying with manufacturer's instructions.
- B. Allow preservative to dry prior to erecting members.

SECTION 06100

ROUGH CARPENTRY

3.5 TOLERANCES

- A. Framing Members: 1/4 inch from true position, maximum.
- B. Surface Flatness of Floor: 1/8 inch in 10 feet maximum, and 1/4 inch in 30 feet maximum.
- C. Variation from Plane (Other than Floors): 1/4 inch in 10 feet maximum, and 1/4 inch in 30 feet maximum.

END OF SECTION

SECTION 06114

WOOD BLOCKING AND CURBING

PART 1 – GENERAL

1.1 SECTION INCLUDES

- A. Roof nailers and curbs.
- B. Blocking in wall and roof openings.
- C. Preservative treatment of wood.
- D. Concealed wood blocking for support of toilet and bath accessories, wall cabinets, wood trim, and all wall mounted items.

1.2 RELATED SECTIONS

- A. Section 05400: Cold Formed Metal Framing
- B. Section 06100: Rough Carpentry.
- C. Section 07531: Single Ply Roofing - Fully Adhered EPDM.
- D. Section 07620: Sheet metal flashing and trim.
- E. Section 09260: Gypsum Board Assemblies.

1.3 REFERENCES

- A. Unless otherwise noted the most current issue of the reference shall be used.
- B. AWPA C2 - Lumber, Timber, Bridge Ties and Mine Ties -- Preservative Treatment by Pressure Processes; American Wood-Preservers' Association.
- C. AWPA C20 - Structural Lumber -- Fire Retardant Treatment by Pressure Processes; American Wood-Preservers' Association.
- D. PS 1 - Construction and Industrial Plywood; National Institute of Standards and Technology (Department of Commerce).
- E. PS 20 - American Softwood Lumber Standard; National Institute of Standards and Technology (Department of Commerce).
- F. RIS (GR) - Standard Specifications for Grades of California Redwood Lumber; Redwood Inspection Service.
- G. SPIB (GR) - Grading Rules; Southern Pine Inspection Bureau, Inc..
- H. WCLB (GR) - Standard Grading Rules for West Coast Lumber No. 17; West Coast Lumber Inspection Bureau.
- I. WWPA G-5 - Western Lumber Grading Rules; Western Wood Products Association.

1.4 SUBMITTALS

- A. See Section 01300 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide technical data on wood preservative materials.

1.5 QUALITY ASSURANCE

- A. Lumber: Comply with PS 20 and approved grading rules and inspection agencies.
 - 1. Acceptable Lumber Inspection Agencies: RIS, SPIB, WCLB, and WWPA.
 - 2. Lumber of other species or grades, or graded by other agencies, is acceptable provided structural and appearance characteristics are equivalent to or better than products specified.
- B. Plywood: Comply with PS 1.

PART 2 – PRODUCTS

2.1 DIMENSION LUMBER

- A. Grading Agency: Western Wood Products Association (WWPA).
- B. Sizes: Nominal sizes as indicated on drawings, S4S. Wood blocking for all wall mounted items shall be 2 x 6 inch nominal unless otherwise noted.
- C. Moisture Content: S-dry or MC19.
- D. Miscellaneous Blocking, Furring, and Nailers:
 - 1. Structural grade 1200fb Douglas Fir as defined in Section 06100.

SECTION 06114

WOOD BLOCKING AND CURBING

2.2 CONSTRUCTION PANELS

- A. Plywood Sheathing: PS 1, Grade C-D, Exposure I. Panels shall be treated as listed in the Factory Wood Treatment article of this section and as listed in the schedule.
- B. All other panels as listed in Section 06100.

2.3 ACCESSORIES

- A. Fasteners and Anchors:
 - 1. Fasteners: Hot-dipped galvanized steel for high humidity and treated wood locations, unfinished steel elsewhere.
 - 2. Anchors: Expansion shield and lag bolt type for anchorage to solid masonry or concrete. Anchor bolt for anchorage into cavity walls.

2.4 FACTORY WOOD TREATMENT

- A. Wood preservative pressure treatment: ACQ Type D preservative; retention level .25
 - 1. Kiln dry after treatment to maximum moisture content of 19 percent.
 - 2. Treat wood in contact with roofing, flashing, or waterproofing.
 - 3. Treat wood in contact with masonry or concrete.
 - 4. Treat wood less than 18 inches above grade.
- B. Fire Retardant Treatment: AWWPA Treatment C20, Interior Type, Class A, Low Hygroscopic, Chemically treated and pressure impregnated; capable of providing a maximum flame spread/smoke development rating of 25 / 450.

PART 3 – EXECUTION

3.1 PREPARATION

- A. Examine all surfaces to receive parts of the work specified herein. Application or installation of materials constitutes acceptance of the substrate.
- B. Verify all dimensions of in-place and subsequent construction and that it accurately fit this part of the work to other construction.
- C. Protect lumber and keep under cover both in transit and at job site. Protect from dampness.

3.2 FRAMING

- A. Set members level and plumb, in correct position.
- B. Place horizontal members with crown side up.
- C. Curb roof openings except where prefabricated curbs are provided. Form corners by alternating lapping side members.
- D. Coordinate curb installation with installation of decking and support of deck openings.
- E. All wood blocking that is installed is to be temporarily protected from moisture utilizing 15 lb. roofing felt.
- F. All wood blocking joints to be mitered @ 45 degrees, staggered, and screw fastened together.
- G. Provide miscellaneous members as indicated or as required to support finishes, fixtures, specialty items, and trim.

3.3 INSTALLATION OF CONSTRUCTION PANELS

- A. Sheathing: Secure with long dimension perpendicular to framing members, with ends over firm bearing and staggered, using screws.

SECTION 06114

WOOD BLOCKING AND CURBING

3.4 SCHEDULES

- A. Roof Blocking: S/P/F species, 19 percent maximum moisture content, pressure preservative treatment. Roof edge and roof related wood blocking.
- B. Treated plywood: Roof edge and roof related conditions.
- C. Miscellaneous wood blocking exterior: S/P/F species, 19 percent maximum moisture content, pressure preservative treatment.
- D. Miscellaneous wood blocking interior: Provide wood blocking for support of toilet and bath accessories, wall cabinets, wood trim, and all other wall mounted items. Utilize material as listed in this section and in section 06100. Wood blocking for wall mounted items shall be minimum of 2 x 6 inch nominal dimensional lumber. Fasten wood blocking with minimum 2 screws each side into framing. Where conflicts occur, the more astringent requirement shall prevail.

END OF SECTION

SECTION 06200

FINISH CARPENTRY

PART 1 – GENERAL

1.1 SECTION INCLUDES

- A. Finish carpentry items.
- B. Hardware and attachment accessories.

1.2 RELATED SECTIONS

- A. Section 06410 - Custom Cabinets: Shop fabricated custom cabinet work.
- B. Section 08211 - Flush Wood Doors.
- C. Section 09900 - Paints and Coatings: Painting and finishing of finish carpentry items.

1.3 REFERENCES

- A. Unless otherwise noted the most current issue of the reference shall be used.
- B. ANSI A208.1 - American National Standard for Particleboard.
- C. AWI (QSI) - Architectural Woodwork Quality Standards Illustrated; Architectural Woodwork Institute.
- D. NEMA LD 3 - High-Pressure Decorative Laminates; National Electrical Manufacturers Association.
- E. PS 1 - Construction and Industrial Plywood; National Institute of Standards and Technology (Department of Commerce).

1.4 SUBMITTALS

- A. See Section 01300 - Administrative Requirements for submittal procedures.
- B. Shop Drawings: Indicate materials, component profiles, fastening methods, jointing details, accessories, to a minimum scale of 1-1/2 inch to 1 ft.

1.5 QUALITY ASSURANCE

- A. Perform work in accordance with AWI Architectural Woodwork Quality Standards Illustrated, Custom grade.
- B. Fabricator Qualifications: Company specializing in fabricating the products specified in this section with minimum three years of documented experience.

1.6 REGULATORY REQUIREMENTS

- A. Comply with applicable code for fire retardant requirements.

1.7 DELIVERY, STORAGE, AND PROTECTION

- A. Protect work from moisture damage.

1.8 PROJECT CONDITIONS

- A. Sequence installation to ensure utility connections are achieved in an orderly and expeditious manner.
- B. Coordinate the work with plumbing rough-in, electrical rough-in, and installation of associated and adjacent components.

PART 2 - PRODUCTS

2.1 LUMBER MATERIALS

- A. Softwood Lumber: Cut and Species to match **WD-1** and **WD-2** (where each is called out on Architectural drawings), maximum moisture content of 6 percent; with vertical grain, of quality suitable for transparent finish.

SECTION 06200

FINISH CARPENTRY

2.2 SHEET MATERIALS

- A. Softwood Plywood: PS 1 Grade A-B; Veneer core;
- B. Particleboard: ANSI A208.1; composed of wood chips, sawdust, or flakes of medium density, made with waterproof resin binders; of grade to suit application; sanded faces.

2.3 ADHESIVE

- A. Adhesive: Type recommended by laminate manufacturer to suit application.

2.4 FASTENERS

- A. Fasteners: Of size and type to suit application; finish with wood filler in concealed and exposed locations.

2.5 ACCESSORIES

- A. Wood Filler: Solvent based, tinted to match surface finish color.

2.6 FABRICATION

- A. Shop assemble work for delivery to site, permitting passage through building openings.
- B. Cap exposed plastic laminate finish edges with material of same finish and pattern.
- C. When necessary to cut and fit on site, provide materials with ample allowance for cutting. Provide trim for scribing and site cutting.
- D. Apply plastic laminate finish in full uninterrupted sheets consistent with manufactured sizes. Fit corners and joints hairline; secure with concealed fasteners. Slightly bevel arises. Locate counter butt joints minimum 2 feet from sink cut-outs.

2.7 SHOP FINISHING

- A. Sand work smooth and set exposed nails and screws.
- B. Apply wood filler in exposed nail and screw indentations.
- C. On items to receive transparent finishes, use wood filler which matches surrounding surfaces and of types recommended for applied finishes.

PART 3 – EXECUTION

3.1 EXAMINATION

- A. Verify adequacy of backing and support framing.
- B. Verify mechanical, electrical, and building items affecting work of this section are placed and ready to receive this work.

3.2 INSTALLATION

- A. Set and secure materials and components in place, plumb and level.
- B. Carefully scribe work abutting other components, with maximum gaps of 1/32 inch. Do not use additional overlay trim to conceal larger gaps.

3.3 PREPARATION FOR SITE FINISHING

- A. Set exposed fasteners. Apply wood filler in exposed fastener indentations. Sand work smooth.
- B. Site Finishing: Refer to Section 09900.

3.4 ERECTION TOLERANCES

- A. Maximum Variation from True Position: 1/16 inch.
- B. Maximum Offset from True Alignment with Abutting Materials: 1/32 inch.

END OF SECTION

SECTION 06410

CUSTOM WOOD CABINETS

PART 1 – GENERAL

1.1 SECTION INCLUDES

- A. Pre-fabricated cabinet units.
- B. Cabinet hardware.
- C. Preparation for installing utilities.

1.2 RELATED SECTIONS

- A. Section 06114 – Wood Blocking and Curbing.
- B. Section 06651 – Solid Surface Countertops.
- C. Section 15440 – Plumbing Fixtures.

1.3 REFERENCES

- A. AWI P-200 - Architectural Woodwork Quality Standards Illustrated; Architectural Woodwork Institute; 1997, Seventh Edition, Version 1.0.
- B. NHLA G-101 - Rules for the Measurement & Inspection of Hardwood & Cypress; National Hardwood Lumber Association; 1998.

1.4 SUBMITTALS

- A. Shop Drawings: Indicate materials, component profiles and elevations, assembly methods, joint details, fastening methods, accessory listings, hardware location and schedule of finishes.
- B. Product Data: Provide data for hardware accessories.
- C. Samples: After selection of color by Architect, submit two, 12 x 18 inch in size, illustrating cabinet finish, counter top finish, and edge conditions.
- D. Samples: Submit two samples of pulls, hinges, and other accessories illustrating hardware finish and design.

1.5 QUALITY ASSURANCE

- A. Perform all work in accordance with AWI Architectural Woodwork Quality Standards Illustrated, Custom quality. Excepting that all sight exposed shelving and casework interior surfaces of open shelving units shall be clad in finished plywood.
- B. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum five years of documented experience.

1.6 DELIVERY, STORAGE, AND PROTECTION

- A. Protect units from moisture damage.

1.7 ENVIRONMENTAL REQUIREMENTS

- A. During and after installation of work of this section, maintain the same temperature and humidity conditions in building spaces as will occur after occupancy.

1.8 WARRANTY

- A. All materials and workmanship covered by this section shall carry a 3 year warranty.

PART 2 – PRODUCTS

2.1 MANUFACTURERS

- A. Basis of Design: Legacy Cabinets; <http://www.legacycabinetsllc.com>.
 - 1. Debut Series; Maple; Door Style; Dublin– Finish - Ash
- B. Substitutions: See Section 01600 - Product Requirements.

2.2 WOOD MATERIALS

- A. Hardwood Lumber: NHLA graded in accordance with AWI Architectural Woodwork Quality Standards Illustrated, Custom; average moisture content of 6 percent.

SECTION 06410

CUSTOM WOOD CABINETS

2.3 COMPONENTS

- A. Front Panel:
 - 1. Solid wood stiles, rails and center panels;
 - 2. Species: Maple, or approved equal.
- B. End Panels: ½" thick finished plywood.
- C. Tops and Bottoms: ½" thick plywood.
- D. Shelves: Adjustable ¾" thick plywood (base cabinets half-depth).
- E. Backs: ½" thick plywood.
- F. Base Toe Kick: Pressure treated solid lumbar platform toe kick (front and exposed sides).
- G. Stretcher Rail: ¾" x 1-3/4" front to back.
- H. Standard Drawers: ½" thick plywood.
 - 1. Drawer Guides: 75lb capacity.
 - 2. Drawer Box: ½" thick sides
 - 3. Drawer Bottom: ½" thick bottom

2.4 ACCESSORIES

- A. Adhesive: FS MMM-A-130 contact adhesive. Type recommended by AWI and manufacturer to suit application.

2.5 HARDWARE

- A. Hardware: BHMA A156.9. Unless exceeded herein.
- B. Shelf Standards and Brackets: Where rear support of shelving is required standards shall be heavy duty recessed formed channels, cut for heavy duty shelf brackets with CAM lock lever. Electroplated or powder coated finish as selected by Architect.
 - 1. Adjustable Shelf Supports:
 - a. Shall be injection molded polycarbonate, clear color to blend with selected interior finish, friction fit into cabinet end panels and vertical dividers, readily adjustable on 32mm (approximately 1¼") CENTERS. Each shelf support shall have two (2) integral support pins, 5mm diameter, to interface pre-drilled holes, and to prevent accidental rotation of support. The supports shall be automatically adaptable to ¾" or 1" thick shelving and shall provide non-tip feature for shelving. Supports are designed to readily permit field fixing of shelf if desired. Structural load testing shall show loading to 1,040 pounds (260 lbs. per support) without failure.
 - 2. Door Pulls: Front pull shall be brushed stainless steel finished metal wire style, 96mm spacing on fasteners. Pull design shall be compatible with Americans with Disability Act (ADA), Federal Register Volume 56, No. 144, specifically Paragraph 4.27.4.
 - 3. Catches: Magnetic; minimum 7 lb. pull, provide 2 per door for units over 48 inches high. Elbow catches shall be used on inactive doors less than 73" tall.
 - 4. Hinges:
 - a. Grass TEC Self-Close Hinge, all steel components, standard overlay.

2.6 SHOP TREATMENT OF WOOD MATERIALS

- A. Shop brush-apply wood materials requiring UL fire rating to concealed wood blocking.
- B. Provide UL approved identification on fire retardant treated material.
- C. Deliver fire retardant treated materials cut to required sizes. Minimize field cutting.

2.7 FABRICATION

- A. Shop assemble casework for delivery to site in units easily handled and to permit passage through building openings.
- B. When necessary to cut and fit on site, provide materials with ample allowance for cutting. Provide trim for scribing and site cutting.
- C. Provide cutouts for plumbing fixtures, inserts, appliances, outlet boxes, fixtures and fittings, and other accessories. Verify locations of cutouts from on-site dimensions. Seal cut edges.
- D. Fabricate casework to dimensions, profiles, and details shown.

SECTION 06410

CUSTOM WOOD CABINETS

- E. Cabinet Body Construction:
1. Refer to Section 2.3 (Components) for additional information.
 2. Tops and bottoms shall be joined to cabinet ends and internal cabinet components such as fixed horizontals, rails and verticals shall be joined using 10mm diameter industrial grade hardwood dowels, laterally fluted with chamfered ends, securely glued and clamped under pressure during assembly to secure joints and cabinet squareness. Use minimum of six (6) dowels at each joint for 24 in. deep cabinet and minimum of four (4) dowels at each joint for 12" deep cabinets.
 3. All undercounter units except sink base units, shall be provided with full sub-top. Sink base units shall be provided with open top, front welded steel/epoxy painted sink rail full width at top front edge concealed behind face rail/doors, split back removable access panels and bottom panel to have CL20 high pressure cabinet liner both faces, color to match interior color. No exceptions will be permitted.
 - a. Contractor to coordinate exact requirements for installation of solid surface countertops where indicated.
 4. All end panels and vertical dividers, except sink base units, shall be prepared to receive adjustable shell hardware at 32mm (approximately 1¼") centers. Door hinge, drawer slides and pull-out shelves shall mount on line boring to maintain vertical alignment of components and provide for future relocation of doors, drawers, shelves and/or pull-out shelves.
 5. Interior finish, units with closed interiors:
 - a. Sides, top, bottom, horizontal and vertical members and adjustable shelving faced with laminated oak veneer with matching prefinished back.
 6. Exposed ends:
 - a. Shall be faced with laminated oak veneer over plywood.
 7. Unfinished core stock surfaces, even on concealed surfaces (excluding edges), will not be permitted. No exceptions.
- F. Door Fronts (Solid Wood Only):
1. Grade: Custom
 2. AWI Type of Cabinet Construction: Reveal Overlay
 3. WI Construction Type: Type I
 4. WI Door Front Style: Reveal Overlay
 5. Reveal Dimension: 1/2"
 6. Wood Species and Cut for Exposed Surfaces: Selected by Architect from manufacturer's full line.
 - a. Grain Direction: Vertically for drawer fronts, doors and fixed panels.
 - b. Matching of Veneer Leaves: Slip Match
 - c. Vertical Matching of Veneer Leaves: End Match
 7. Semi-exposed surfaces: Provide surface materials indicated below:
 - a. Surfaces other than drawer bodies: Same species and cut indicated for exposed surfaces.
 - b. Drawer sides and backs: solid hardwood lumber
 - c. Drawer bottoms: hardwood plywood
 8. Provide dust panels of ¼" plywood or tempered hardboard above compartments and drawers, unless located directly under tops.

PART 3 – EXECUTION

3.1 EXAMINATION

- A. Verify adequacy of backing and support framing in both existing spaces to receive casework and new spaces to receive casework
- B. Verify location and sizes of utility rough-in associated with work of this section.

SECTION 06410

CUSTOM WOOD CABINETS

3.2 INSTALLATION

- A. Set and secure casework in place; rigid, plumb, and level.
- B. Use fixture attachments in concealed locations for wall mounted components.
- C. Use concealed joint fasteners to align and secure adjoining cabinet units.
- D. Carefully scribe casework abutting other components, with maximum gaps of 1/32 inch. Do not use additional overlay trim for this purpose.
- E. Secure cabinet to floor using appropriate angles and anchorages.
- F. Countersink anchorage devices at exposed locations. Conceal with solid wood plugs of species to match surrounding wood; finish flush with surrounding surfaces.
- G. All upper cabinets to be installed above a sink/lavatory to be mounted 18" minimum for Owner installation of paper towel dispenser – notify architect of any discrepancy prior to order and installation.

3.3 ADJUSTING

- A. Adjust moving or operating parts to function smoothly and correctly.

3.4 CLEANING

- A. Clean casework, counters, shelves, hardware, fittings, and fixtures.

END OF SECTION

SECTION 06411

PLASTIC LAMINATE-CLAD CASEWORK

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Cabinet hardware.
- B. Plastic laminate open casework units.

1.2 REFERENCES

- A. Unless otherwise noted the most current issue of the reference shall be used.
- B. AWI P-200 - Architectural Woodwork Quality Standards Illustrated; Architectural Woodwork Institute.
- C. NEMA LD 3 - High-Pressure Decorative Laminates; National Electrical Manufacturers Association.
- D. NHLA G-101 - Rules for the Measurement & Inspection of Hardwood & Cypress; National Hardwood Lumber Association.

1.3 SUBMITTALS

- A. Shop Drawings: Indicate materials, component profiles and elevations, assembly methods, joint details, fastening methods, accessory listings, hardware location and schedule of finishes.
- B. Product Data: Provide data for hardware accessories.
- C. Samples: After selection of color by Architect, submit two, 12 x 18 inch in size, illustrating cabinet finish, and edge conditions.

1.4 QUALITY ASSURANCE

- A. Perform all work in accordance with AWI Architectural Woodwork Quality Standards Illustrated, Custom quality, except that all sight exposed shelving and casework interior surfaces of open shelving units shall be clad in high pressure laminate of type to match that used for door and drawer fronts.
- B. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum five years of documented experience.

1.5 DELIVERY, STORAGE, AND PROTECTION

- A. Protect units from moisture damage.

1.6 ENVIRONMENTAL REQUIREMENTS

- A. During and after installation of work of this section, maintain the same temperature and humidity conditions in building spaces as will occur after occupancy.

1.7 WARRANTY

- A. All materials and fabrication covered by this section shall carry a 3 year warranty.

PART 2 – PRODUCTS

2.1 MANUFACTURERS – PLASTIC LAMINATE CASEWORK UNITS

- A. Stevens, 704 W. Main Street, Teutopolis, IL 62467 Phone: (217) 857-6411
- B. Case Systems, P.O. Box 2044, Midland, MI 48641 Phone: (517) 835-7773
- C. TMI, 050 3rd Avenue, West Dickinson, ND 58601 Phone: (701) 225-6716
- D. Substitutions: Custom fabricated casework units shall be permitted with approval of Architect. Custom fabricated units shall meet or exceed quality of construction indicated in specifications and level of quality provided by specified manufacturers.

SECTION 06411

PLASTIC LAMINATE-CLAD CASEWORK

2.2 MANUFACTURERS - PLASTIC LAMINATE

- A. Manufacturers, (refer to Finish Legend in Architectural drawings for colors/ finishes and locations of each):
- B. Laminate Color Selections:
 - 1. Cabinet Body Color:
 - a. Colors for sight exposed cabinet surfaces, including open shelving and interiors of doorless cabinets, grade GP28, are provided on the Finish Legend. Refer to Architectural drawings for color, finish selections and locations.

2.3 LAMINATE MATERIALS

- A. Laminates shall be thermally fused to meet the performance requirements of ANSI/NEMA 3 LD – 2000 for GP-28 Cabinet.
- B. Definition: Identification of casework components by surface visibility. Listed are definitions and materials commonly used in defining decorative laminate clad casework. Refer to Fabrication section for those items selected for use on this project.
 - 1. Open Interiors: Any open storage unit without solid door or drawer fronts and units with full glass doors and/or acrylic doors.
 - 2. Exposed Ends: Any storage unit exterior side surface that is visible after installation.
 - 3. Semi-Exposed Surfaces: Interior surfaces which are visible, bottoms of wall cabinets and tops of cabinets 72" or more above finished floor.
 - 4. Concealed Surfaces: Any surface not visible after installation.
- C. Decorative Laminates / Veneer Where Applicable:
 - 1. High pressure decorative laminate GP28 (.028), NEMA Test LD-3-1995
 - 2. High pressure decorative laminate PG50 (.050), NEMA Test LD-3-1995.
 - 3. High pressure decorative laminate PF42 (.042), NEMA Test LD-3-1995.
 - 4. High pressure cabinet liner CL20 (.020), NEMA Test LD-3-1995.
 - 5. High pressure backer BK20 (.020).
- D. Side panels, back, top, drawer fronts, and doors shall be ¾" thick particleboard, laminated on the exterior with high pressure decorative laminate GP28. All exposed edges shall be finished with machine applied OBC banding, 3mm thickness.
- E. Substrate: Particleboard: ANSI A208.1; Grade M-3 Industrial; type as specified in AWI Architectural Woodwork Quality Standards Illustrated, composed of wood chips, medium density, made with high waterproof resin adhesive; of grade to suit application; sanded faces, located as described in fabrication.

2.4 ACCESSORIES

- A. Adhesive: FS MMM-A-130 contact adhesive. Type recommended by AWI and laminate manufacturer to suit application. All adhesives shall be mechanically applied.
- B. PVC Edge Trim: Edging Materials / Colors
 - 1. 3mm PVC banding, machine applied with waterproof hot melt adhesive with external edges and outside corners of door and drawer fronts, and countertops, machine profiled to 1/8" radius for safety.
 - 2. PVC banding shall be available in colors matched to manufacturer's laminates of the same name. Width shall match component thickness. Color to be chosen by Architect from manufacturer's full range. Architect may choose color rather than matching laminate.
 - 3. Barbed T-edging or laminate self-edge on cabinet components will not be acceptable.
 - 4. Undercounter support frames, legs and miscellaneous metal parts shall be furniture steel unless noted otherwise, welded, degreased, cleaned, treated and epoxy powder painted in standard colors to match basic cabinet body color, or in a contrasting color
- C. Laminate Backing Sheet: 0.020 inch Backing Sheet grade, undecorated plastic laminate.

SECTION 06411

PLASTIC LAMINATE-CLAD CASEWORK

2.5 HARDWARE

- A. Hardware: BHMA A156.9. Unless exceeded herein.
- B. Coat Hooks: Double Ceiling Hook- IVES, Aluminum IV580A92 1-7/8"W X 1"H

2.6 FABRICATION

- A. Shop assemble casework for delivery to site in units easily handled and to permit passage through building openings.
- B. When necessary to cut and fit on site, provide materials with ample allowance for cutting. Provide trim for scribing and site cutting.
- C. Apply plastic laminate finish in full uninterrupted sheets consistent with manufactured sizes. Fit corners and joints hairline; secure with concealed fasteners. Slightly bevel arises. Locate counter butt joints minimum 2 feet from sink cut-outs.
- D. Fabricate casework to dimensions, profiles, and details shown.
- E. Plastic Laminate Cabinet Body Construction:
 - 1. Tops and bottoms shall be joined to cabinet ends and internal cabinet components such as fixed horizontals, rails and verticals shall be joined using 10mm diameter industrial grade hardwood dowels, laterally fluted with chamfered ends, securely glued and clamped under pressure during assembly to secure joints and cabinet squareness. Use minimum of six (6) dowels at each joint for 24 in. deep cabinet and minimum of four (4) dowels at each joint for 12" deep cabinets.
 - 2. Unless specifically indicated, core shall be 3/4" thick particleboard. Edging and surface finishes as indicated herein.
 - 3. Backs shall be 3/4" particleboard, color matched to cabinet interior, exterior surface GP28 laminate as selected.
 - 4. All exposed and semi exposed edges of basic cabinet components shall be factory edged with PVC banding, machine applied with waterproof hot melted adhesive.
 - a. Edging shall be 3mm PVC, available in matching colors.
 - 5. Fixed center shelf shall be 3/4" particleboard, color matched to cabinet interior, exterior surface GP28 laminate as selected.
 - 6. Front edge of shelves and unit shall be plastic laminate in color to match units.
 - 7. Exposed ends:
 - a. Shall be faced with high pressure decorative laminate GP28 (.028) color from laminate manufacturer's full range.
 - 8. Balanced construction of all laminated panels is mandatory. Unfinished core stock surfaces, even on concealed surfaces (excluding edges), will not be permitted. No exceptions.
- F. Plastic laminate exterior faces shall be laminated with high-pressure decorative laminate GP28, color as selected. Interior face shall be high-pressure cabinet liner CL20.
- G. All edges of Plastic Laminate units shall be finished with 3mm PVC to match PL-1. External edges and outside corners shall be machine profiled to 1/8" radius.

PART 3 – EXECUTION

3.1 EXAMINATION

- A. Verify adequacy of backing and support framing in both existing spaces to receive casework and new spaces to receive casework
- B. Verify location and sizes of utility rough-in associated with work of this section.

3.2 INSTALLATION

- A. Set and secure casework in place; rigid, plumb, and level.
- B. Use fixture attachments in concealed locations for wall mounted components.
- C. Use concealed joint fasteners to align and secure adjoining cabinet units.
- D. Carefully scribe casework abutting other components, with maximum gaps of 1/32 inch. Do not use additional overlay trim for this purpose.

SECTION 06411

PLASTIC LAMINATE-CLAD CASEWORK

- E. Countersink anchorage devices at exposed locations. Conceal with solid wood plugs of species to match surrounding wood; finish flush with surrounding surfaces.

3.3 CLEANING

- A. Clean casework.

END OF SECTION

SECTION 06421

WOOD FLOORING PLANK

PART 1 – GENERAL

1.1 SUMMARY

- A. Section includes:
 - 1. Wood Flooring Plank (**WD-1, WD-2**)
- B. Related Sections:
 - 1. Section 06100 – Rough Carpentry
 - 2. Section 06114 – Wood Blocking and Curbing
 - 3. Section 06200 – Finish Carpentry

1.2 SUBMITTALS

- A. Submit the following items in compliance with submittal procedures in Section 01300 – Administrative Requirements:
 - 1. Product Data: Submit manufacturer's product data including finish data.
 - 2. Samples:
 - a. Submit manufacturer's Prefinished sample according to specifications for species, color, finish, width, thickness - minimum 6 inch (150 mm) in length
 - b. Fasteners
 - c. One of each specified accessory, minimum 4 inch (100 mm) in length
 - 3. Installation fasteners
 - 4. Material Certifications: Submit material certifications.
 - 5. Quality Assurance/Control Submittals:
 - a. Qualifications: Proof of manufacturer and installer qualifications.
 - b. Manufacturer's Installation Guidelines.
 - 6. Shop Drawings: Indicate;
 - a. Location and extent of each type, finish, color, pattern, size, etc., of Wood Flooring Plank.
 - b. Borders and patterns created by Wood Flooring Plank. Include wood species and the orientation of Planks in the space.
 - c. Details and locations of wood and fasteners if any.
 - d. Details and locations of trim and moldings that match wood Planks. Indicate sizes to the extent not specified.
 - e. Details to accommodate expansion to the extent not specified.
 - f. Details of Wood Flooring Plank interface with supporting construction.
 - g. Details of unusual edge conditions, profiles, plugged screw holes, and similar features
- B. Submit the following items in compliance with Section 01780 – Closeout Submittals:
 - 1. Maintenance Instructions

1.3 QUALITY ASSURANCE

- A. Manufacturer's Qualifications: Minimum five years of experience in the development, manufacturer and distribution of high-performance solid or engineered wood plank similar to that specified.
- B. Installer's Qualifications: Minimum three years of experience installing hardwood.

1.4 DELIVERY, STORAGE AND HANDLING

- A. Delivery: Deliver materials to site in manufacturer's original, unopened containers and packaging, with labels clearly identifying product name and manufacturer no later than one week prior to installation date.
- B. Storage: Store materials in clean, dry area indoors on flat, level surface in accordance with manufacturer's instructions. Do not store boxes directly on concrete or near outside wall.
- C. Project/Site Conditions:
 - 1. Environmental Requirements: HVAC systems must be operational and controlling site temperature and humidity. Area to receive Paneling must be maintained at normal occupancy temperature (60-70°F and humidity levels (35-55% humidity) for minimum of one week prior to installation as well as during and continuously following installation.

SECTION 06421

WOOD FLOORING PLANK

2. Wood substrates: should be below 12% moisture content (MC) and within 4% of material moisture content for engineered materials and solid materials less than 3 inches wide; and within 2% of material moisture content for solid materials 3 inches and wider.

PART 2 – PRODUCTS

2.1 MANUFACTURER

- A. Basis of Design Manufacturer -- reSAWN TIMBER co., 306 Keystone Drive, Telford, PA 18969; Website: www.resawntimberco.com; Phone: 1-215-709-2001; e-mail: info@resawntimberco.com
 1. Or an as equal product that meets the full requirements of the specifications and drawings.
 2. Substitutions: See Section 01600 – Product Requirements

2.2 WD-1– MEDITATION – North American White Oak

1. Face Species: North American White Oak, FSC certified.
2. Cut: Rift and Quarter Sawn
3. Grade: Select
4. Applications: Interior Flooring + Cladding
5. Construction: Engineered
6. Overall Thickness: 5/8"
7. Width: 7"
8. Length: 2'-10' Random Lengths
9. Edge: Microbeveled Edges and Ends
10. Factory Finish: sealed on face only (interior) – matte polyurethane
11. Physical Property Performance Requirements:
 - a. Janke Hardness: ASTM D 1037 - 1,360
 - b. Flame Spread Class Rating: ASTM E 84 – Class C (III)
 - c. Flash point: cc (ASTM D 93): > 215°F (PenskyMartens)
 - d. Resistance to water (NEN-EN 13442): no visual or tangible changes.
 - e. Resistance to wear: (NEN 2072 – Taber Abraser en CS 17 sanding wheels): strong absorption basantol liquid, only after 800 to1000 rotations.
 - f. Resistance to Heat: Until 212 °F

2.3 WD-2– TARANTELLA – North American White Oak

1. Face Species: North American White Oak, FSC certified.
2. Cut: Rift and Quarter Sawn
3. Grade: Select
4. Applications: Interior Flooring + Cladding
5. Construction: Engineered
6. Overall Thickness: 5/8"
7. Width: 7"
8. Length: 2'-10' Random Lengths
9. Edge: Microbeveled Edges and Ends
10. Factory Finish: sealed on face only (interior) – matte polyurethane
11. Physical Property Performance Requirements:
 - a. Janke Hardness: ASTM D 1037 - 1,360
 - b. Flame Spread Class Rating: ASTM E 84 – Class C (III)
 - c. Flash point: cc (ASTM D 93): > 215°F (PenskyMartens)
 - d. Resistance to water (NEN-EN 13442): no visual or tangible changes.
 - e. Resistance to wear: (NEN 2072 – Taber Abraser en CS 17 sanding wheels): strong absorption basantol liquid, only after 800 to1000 rotations.
 - f. Resistance to Heat: Until 212 °F

2.4 FASTENERS: Concealed Per Drawings.

SECTION 06421

WOOD FLOORING PLANK

PART 3 – EXECUTION

3.1 EXAMINATION

- A. Examine substrates upon which wood planks will be installed.
 - 1. Verify that substrate is structurally sound, clean, dry, and free of contaminants.
 - 2. In wood frame structures, do not begin installation of Planks until the moisture content of wood substrate is at a maximum of 12% and within 4% of material moisture content for engineered materials and solid materials less than 3 inches wide; and within 2% of material moisture content for solid materials 3 inches and wider.
- B. Verify that HVAC system is operation and maintaining occupancy level temperature and humidity conditions.
- C. Report unsatisfactory conditions to Architect and/or General Contractor and correct before proceeding.
- D. Commencement of work by installer is considered an acceptance of substrate conditions.
- E. Prior to installation, the installer shall examine all material and determine that it matches the work order.

3.2 PREPARATION

- A. Acclimate planks according to manufacturer's instructions.
- B. Clean surfaces thoroughly prior to installation.

3.3 INSTALLATION

- A. Install in accordance with manufacturer's complete installation instructions and per details shown on Drawings. Details below are a summary only.
- B. Install in the direction(s)/pattern(s) as shown on Drawings.
- C. Because wood is a natural material, variations in color naturally occur from plank to plank. Each box should be inspected for differences in color with color variation staggered throughout the window seat and frame. For a blended appearance, select pieces randomly from several boxes.
- D. Allow space for expansion and movement at permanent obstructions.
- E. Blind nail Paneling to substrate with power driver as appropriate for this installation. Space fasteners at 6-10" (152-254 mm) and 2" (51 mm) from end of boards. Stagger end joints from row to row by a minimum of 10" (254 mm).

3.4 CLEANING

- A. Reference Final Cleaning Requirements in Section 017300 Execution Requirements.
- B. Follow manufacturer's recommendations for cleaning and maintenance.

3.5 PROTECTION

- A. Repair or replace defective or damaged work as directed by the Architect. All chipped, scratched or otherwise damaged or deflection work will be repaired or replaced. All repairs shall be undetectable. Use manufacturer-supplied touch up stain if required.

END OF SECTION

SECTION 06611

SIMULATED STONE (NATURAL QUARTZ AND RESIN) FABRICATIONS

PART 1 – GENERAL

1.1 SUMMARY

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.
- B. This Section includes, but is not limited to, the following horizontal and trim quartz surfacing product types:
 - 1. Countertops

1.2 RELATED REQUIREMENTS

- A. Section 06410 – Custom Wood Cabinets
- B. Section 06411 – Plastic Laminate-Clad Casework
- C. Section 07900 – Joint Sealers

1.3 REFERENCES

- A. CSA B45/IAPMO ANSI Z124 (previously ANSI Z124.6 – Plastic Sinks).
 - 1. CSA B45/IAPMO ANSI Z124 Section 5.7.1.3 – Point Impact tests.
- B. ASTM C170 – Standard Test Method for Compressive Strength of Dimension Stone.
- C. ASTM C373 – Standard Test Method for Water Absorption, Bulk Density, Apparent Porosity, and Apparent Specific Gravity of Fired Whiteware Products, Ceramic Tiles, and Glass Tiles.
- D. ASTM D570 – Standard Test Method for Water Absorption of Plastics.
- E. ASTM D696 – Standard Test Method for Coefficient of Linear Thermal Expansion of Plastics Between -30°C and 30°C with a Vitreous Silica Dilatometer.
- F. ASTM D792 – Standard Test Methods for Density and Specific Gravity (Relative Density) of Plastics by Displacement.
- G. ASTM E84 – Standard Test Method for Surface Burning Characteristics of Building Materials.
- H. ASTM G21 – Standard Practice for Determining Resistance of Synthetic Polymeric Materials to Fungi.
- I. ASTM G22 – Standard Practice for Determining Resistance of Plastics to Bacteria.
- J. CSA B45.5-11/IAPMO Z124-2011 – Plastic Plumbing Fixtures.
- K. NFPA (National Fire Protection Association) - NFPA 101®, Life Safety Code®.
- L. NFPA 255 – Standard Method of Test of Surface Burning Characteristics of Building Materials.
- M. ISO (International Organization for Standardization) - ISO 14001 – Environmental Management Systems.
- N. UL (Underwriters Laboratories) - UL 723 – Standard Test Method for Surface Burning Characteristics of Building Materials.
- O. ULC (Underwriters Laboratories of Canada) – ULC/CAN-S102 – Standard Method of Test for Surface Burning Characteristics of Building Materials and Assemblies.

1.4 SUBMITTALS

- A. Submit product data for each type of product indicated.
 - 1. Submit manufacturer's product data on material characteristics, performance properties, fabrication instructions, installation instructions and maintenance instructions.
- B. Shop drawings:
 - 1. Show location of each item; provide complete detailed and dimensioned plans and elevations, large-scale details, attachment devices and other components.
 - a. Show the following:
 - 1) Full-size details, edge details, attachments, etc.
 - 2) Locations and sizes of furring, blocking, including concealed blocking and reinforcement specified in other Sections.
 - 3) Fabrication details for brackets.
 - 4) Locations and sizes of cutouts and holes for plumbing fixtures, faucets, and other items installed in quartz surface.
 - 5) Locations and sizes of cutouts for sink installation and lavatory installation.

SECTION 06611

SIMULATED STONE (NATURAL QUARTZ AND RESIN) FABRICATIONS

- 6) Type of sealant.
 - 7) Type of adhesive.
 - 8) Seam locations.
- C. Samples:
1. For each type of product indicated:
 - a. Submit minimum 2-inch-by-2-inch sample in specified color. For viewing pattern or veining, submit minimum 4-inch-by-4-inch samples.
 - b. Cut sample and seam together for representation of seaming techniques.
 - c. Indicate full range of color and pattern variation.
 - d. Approved samples will be retained as a standard for work.
- D. Product data:
1. Indicate product description, fabrication information and compliance with specified performance requirements.
- E. Fabricator/installer qualifications:
1. Provide copy of certification number.
- F. Fire test response characteristics:
1. United States – Provide Class A surface burning characteristics as determined by testing products per UL 723 (ASTM E 84, NFPA 255) or another testing and inspecting agency acceptable to authorities having jurisdiction.
 - a. Flame Spread Index: 25 or less.
 - b. Smoke Developed Index: 450 or less.
- G. Maintenance data:
1. Submit manufacturer's care and maintenance data.
 2. Include in project closeout documents.

1.5 QUALITY ASSURANCE

- A. Qualifications:
1. Shop employs skilled workers who custom fabricate products similar to those required for this project and whose products have a record of successful in-service performance.
- B. Fabricator/installer qualifications:
1. Work of this section shall be by a certified fabricator/installer, certified in writing by the manufacturer or designated representative.
- C. Allowable tolerances:
1. Variation in component size: $\pm 1/8$ inch (3 mm) over a 10 foot length.
 2. Location of openings: $\pm 1/8$ inch (3 mm) from indicated location.
 3. Minimum of $1/16$ inch and a maximum of $1/8$ inch (3 mm) clearance between quartz surfaces and each wall.
- D. Coordination drawings:
1. Shall be prepared indicating:
 - a. Plumbing work.
 - b. Electrical work.
 - c. Miscellaneous steel for the general work.
 - d. Indicate location of all walls (rated and non-rated), blocking locations and recessed wall items, etc.
 2. Content:
 - a. Project-specific information, drawn accurately to scale.
 - b. Do not base coordination drawings on reproductions of the contract documents or standard printed data.
 - c. Indicate dimensions shown on the contract drawings and make specific note of dimensions that appear to be in conflict with submitted equipment and minimum clearance requirements.

SECTION 06611

SIMULATED STONE (NATURAL QUARTZ AND RESIN) FABRICATIONS

- d. Provide alternate sketches to designer for resolution of such conflicts.
 - 1) Minor dimension changes and difficult installations will not be considered changes to the contract.
 - 2) Drawings shall be produced in 1/2 inch scale for all fabricated items.

1.6 DELIVERY, STORAGE AND HANDLING

- A. Deliver no components to project site until areas are ready for installation.
- B. Store components indoors in clean and dry area prior to installation.
- C. Handle materials to prevent damage to finished surfaces.
- D. Follow manufacturer's safe handling and storage recommendations.
- E. Provide protective coverings to prevent physical damage or staining following installation for duration of project.

1.7 WARRANTY

- A. Provide manufacturer's 10-year warranty.
- B. Damage caused by physical or chemical abuse or damage from excessive heat will not be warranted.

1.8 MAINTENANCE

- A. Provide maintenance requirements as specified by the manufacturer.

PART 2 – PRODUCTS

2.1 MANUFACTURERS

- A. Basis of Design products manufactured by Daltile (basis of design) subject to compliance with the requirements.
 1. Address: 1601 Pratt Boulevard Elk Grove Village, IL 60007
 2. Representative: Dionne Preston, Architectural Sales Representative, phone: 847.471.7710.
 3. Website: www.daltile.com.
 4. Subject to compliance with the requirements, provide the following product: quartz surface from Daltile (basis of design).
- B. Or Equal from Acceptable Manufacturers:
 1. Corian Quartz; www.corian.com
 2. Wilsonart Quartz; www.wilsonart.com/quartz/design-library.
 3. Substitutions: See Section 01600 - Product Requirements.
- C. Products indicated are provided by specified manufacturer. All acceptable manufacturers shall provide products equal in color range, pattern range, performance data, and style to those specified and shall meet or exceed all minimum specifications listed.

2.2 MATERIALS

- A. Material (**QTZ-1** as noted on Finish Legend as provided in Architectural drawings):
 1. Daltile Quartz material composed of ~93 % natural quartz with pigments and resin.
 2. Material shall have minimum physical and performance properties as specified.
- B. Thickness:
 1. 2 cm (3/4 inch) to be used for the Countertops
- C. Edge treatment: As shown on Construction Drawings.
- D. Backsplash:
 1. Applied.
- E. Endsplash:
 1. Applied.

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SIMULATED STONE (NATURAL QUARTZ AND RESIN) FABRICATIONS

F. Performance Properties (TYPICAL RESULTS):

1. Flexural Strength	> 5,300 psi	ASTM D790
2. Flexural Modulus	5.3–5.7 X 106 psi	ASTM D790
3. Compression Strength (Dry)	27,300 psi	ASTM C170
4. Compression Strength (Wet)	24,400 psi	ASTM C170
5. Hardness	7	Mohs Hardness Scale
6. Thermal Expansion	1.45 x 10 ⁻⁵ meter/meter deg C	ASTM D696
7. Thermal Expansion	2.61 x 10 ⁻⁵ inch/inch deg F	ASTM D696
8. Colorfastness	Passes	NEMA LD 3-3.3
9. Gloss (60° Gardner)	45–50	ANSI Z124
10. Wear and Cleanability	Passes	CSA B45.5-11/IAPMO Z124-2011
11. Stain Resistance	Passes	CSA B45.5-11/IAPMO Z124-2011
12. Fungal Resistance	No observed growth on product	ASTM G 21
13. Bacterial Resistance	No observed growth on product	ASTM G 22
14. High Temperature Resistance	None to slight effect	NEMA LD 3-3.6
a. Temperature, 356 deg F		
15. Boiling Water Resistance	None to slight effect	NEMA LD 3-3.5
16. Freeze-Thaw Cycling	Unaffected	ASTM C1026
17. Point Impact	Passes	ANSI Z124.6.4.2
18. Ball Impact Resistance	No failure at 164 inches	NEMA LD 3-3.8
a. Slabs, No fracture, 1/2 lb. ball – 2cm and 3 cm		
19. Static Coefficient of Friction	0.89 (Dry), 0.61 (Wet)	ASTM C1028
20. Abrasion Resistance	139	ASTM C501
21. Density	2.4 g/cm ³	ASTM D792
22. Water Absorption, Long-term	0.12%	ASTM C373
23. Water Absorption, Short	< 0.04%	ASTM C373
24. Moisture Expansion	< 0.01% average	ASTM C370
25. Flammability	Class A, all colors	NFPA 101@ Life Safety Code
26. Flame Spread Index	FSI 0 for 3 cm	UL 723
27. Flame Spread Index	FSI ≤ 5 for 2 cm	UL 723
28. Smoke Developed Index	SDI ≤ 40 for 3 cm	UL 723
29. Smoke Developed Index	SDI ≤ 75 for 2 cm	UL 723
30. Flame Spread Value	0 for 3 cm	CAN/ULC-S102
31. Flame Spread Value	5 for 2 cm	CAN/ULC-S102
32. Smoke Developed Value	10 for 3 cm	CAN/ULC-S102
33. Smoke Developed Value	50 for 2 cm	CAN/ULC S102
34. Nominal Thickness	2 cm and 3 cm	
35. Nominal Weight per square foot for 2cm thickness is 10 pounds		
36. Nominal Weight per square foot for 3cm thickness is 15 pounds		

G. CERTIFICATIONS and APPROVALS:

1. New York City Material Equipment Acceptance Number for DuPont™ Zodiaq® is 431-00-M.
2. NSF/ANSI Standard 51, Listed by NSF.
3. UL Environment/GREENGUARD Certified.
4. UL Environment/GREENGUARD Gold Certified.
5. UL 2824 - Mold Resistant.
6. Kosher, Listed by Star-K.

2.3 ACCESSORY PRODUCTS

A. Integral sink:

1. **Color:**
 - a. **Sink at Kitchen and Faculty Lounge to be Corian #9412 Precision**
 - b. **Sink at Classrooms to be Corian # 859P NEAT**
2. Mounting: Undermount

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SIMULATED STONE (NATURAL QUARTZ AND RESIN) FABRICATIONS

- B. Mounting Adhesives:
 - 1. 100 percent Silicone Sealant.
- C. Seam Adhesive:
 - 1. Joint Adhesive to create color-coordinated seam.

2.4 FABRICATION

- A. Fabricate components to greatest extent practical to sizes and shapes indicated, in accordance with approved shop drawings and manufacturer's printed instructions and technical bulletins.
- B. Form joints between components using manufacturer's standard joint adhesive.
 - 1. Reinforce as required.
 - 2. Rout and finish component edges with clean, sharp returns.
 - 3. Rout cutouts, radii and contours to template.
- C. Smooth edges.

PART 3 – EXECUTION

3.1 INSTALLATION

- A. General
 - 1. Install countertop materials in accordance with manufacturer's instructions.
 - 2. Additional weight from attached sink or lavatory will affect maneuverability of tops during transportation and installation.
 - 3. Carefully plan work to avoid damaging finished tops during transportation and installation.
- B. Install components plumb and level, in accordance with approved shop drawings and product installation details.
 - 1. Tops:
 - a. Flat and true to within 1/8 inch (3 mm) of a flat surface over a 10-foot length.
 - b. Allow a minimum of 1/16 inch to a maximum of 1/8 inch (3 mm) clearance between surface and each wall.
 - c. Form field joints using manufacturer's recommended adhesive (Corian® Joint Adhesive), with joint widths no greater than 1/8 inch (3 mm) in finished work.
 - d. Keep components and hands clean when making joints.
- C. Provide backsplashes and endsplashes as indicated on the drawings.
 - 1. Adhere to countertops using silicone sealant.
 - a. Keep components and hands clean when working with silicone sealant.

3.2 CONNECTIONS

- A. Make electrical connections in accordance with Division 16.

3.3 CLEANING AND PROTECTION

- A. Keep components and hands clean during installation.
- B. Remove adhesives, sealants and other stains in accordance with manufacturer's instructions.
 - 1. Clean exposed surfaces in accordance with manufacturer's instructions.
 - 2. Components shall be clean on date of substantial completion.
 - a. Protect surfaces from damage until date of substantial completion.
 - 3. Replace or repair damaged work in a satisfactory manner.

END OF SECTION

SECTION 07115

BITUMINOUS DAMPPROOFING

PART 1 – GENERAL

1.1 SECTION INCLUDES

- A. Bituminous dampproofing.

1.2 RELATED SECTIONS

- A. Section 02316 - Fill and Backfill.

1.3 REFERENCES

- A. ASTM D 41 - Standard Specification for Asphalt Primer Used in Roofing, Dampproofing, and Waterproofing; 1994 (reapproved 2000).
- B. ASTM D 1227 - Standard Specification for Emulsified Asphalt Used as a Protective Coating for Roofing; 1995 (Reapproved 2000).
- C. ASTM D 2822 - Standard Specification for Asphalt Roof Cement; 1991 (Reapproved 1997).
- D. NRCA ML104 - The NRCA Roofing and Waterproofing; National Roofing Contractors Association; Fifth Edition.

1.4 SUBMITTALS

- A. See Section 01300 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide properties of primer, bitumen, and mastics.

1.5 QUALITY ASSURANCE

- A. Perform work in accordance with NRCA Roofing and Waterproofing Manual.
- B. Installer Qualifications: Company specializing in performing the work of this section with minimum 5 years' experience.

1.6 ENVIRONMENTAL REQUIREMENTS

- A. Maintain ambient temperatures above 40 degrees F for 24 hours before and during application until dampproofing has cured.

PART 2 – PRODUCTS

2.1 MANUFACTURERS

- A. Acceptable Manufacturers:
 - 1. Karnak Chemical Corp: www.karnakcorp.com.
 - 2. Mar-Flex Systems, Inc: www.mar-flex.com.
 - 3. W.R. Meadows, Inc: www.wrmeadows.com.
 - 4. Substitutions: See Section 01600 - Product Requirements.

2.2 COLD ASPHALTIC MATERIALS

- A. Bitumen: Emulsified asphalt, ASTM D 1227; with fiber reinforcement (Type I or II).
- B. Asphalt Primer: ASTM D 41, compatible with substrate.
- C. Sealing Mastic: Asphalt roof cement, ASTM D 2822, Type I.

PART 3 – EXECUTION

3.1 EXAMINATION

- A. Verify existing conditions before starting work.
- B. Verify substrate surfaces are durable, free of matter detrimental to adhesion or application of dampproofing system.
- C. Verify that surfaces and site conditions are ready to receive work.
- D. Verify items which penetrate surfaces to receive dampproofing are securely installed.

SECTION 07115

BITUMINOUS DAMPPROOFING

3.2 PREPARATION

- A. Protect adjacent surfaces not designated to receive dampproofing.
- B. Clean and prepare surfaces to receive dampproofing in accordance with manufacturer's instructions.
- C. Do not apply dampproofing to surfaces unacceptable to manufacturer.
- D. Apply mastic to seal penetrations, small cracks, or minor honeycomb in substrate.

3.3 PIPE PENETRATIONS

- A. Flash pipe with pre-molded pipe flashings where installation is possible.
- B. Where the molded pipe flashings cannot be installed, use field fabricated flashing techniques using uncured EPDM.

3.4 APPLICATION

- A. Prime surfaces in accordance with manufacturer's instructions.
- B. Apply bitumen with mop.
- C. Apply bitumen number of coats in continuous and uniform, per manufacturer's recommendation.
- D. Seal items projecting through dampproofing surface with mastic. Seal watertight.

END OF SECTION

SECTION 07140

FLUID-APPLIED WATERPROOFING

PART 1 – GENERAL

1.1 SECTION INCLUDES

- A. Fluid applied membrane waterproofing and accessories.
- B. Drainage panels and Protection boards.

1.2 RELATED SECTIONS

- A. Section 02316 - Fill and Backfill.
- B. Section 07212 - Board and Batt Insulation: Insulation used for protective cover.
- C. Section 07620 - Sheet Metal Flashing and Trim: Metal parapet covers, copings, and counterflashings.
- D. Section 07900 - Joint Sealers: Sealant for joints in substrates.
- E. Section 15430 - Plumbing Specialties: Roof drain and piping.

1.3 REFERENCES

- A. ASTM E 96 - Standard Test Methods For Water Vapor Transmission of Materials; 2000.
- B. NRCA ML104 - The NRCA Roofing and Waterproofing Manual; National Roofing Contractors Association; Fifth Edition.

1.4 SUBMITTALS

- A. See Section 01300 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide data for all system components: membrane, surface conditioner, neoprene joint cover sheet, joint and crack sealants, and reinforcing.
- C. Shop Drawings: Indicate special joint or termination conditions and conditions of interface with other materials.
 - 1. Draw at 3" = 1'-0".
 - 2. Submit for all of the following termination conditions:
 - a. At masonry walls.
 - b. At concrete walls.
 - c. At door sills.
 - d. At concrete beams.
 - e. At precast concrete joints.
 - f. At transition into grade.
 - g. At roof drains.
- D. Certificate: Certify that products meet or exceed specified requirements.
- E. Manufacturer's Installation Instructions: Indicate special procedures, perimeter conditions requiring special attention, and acceptable installation temperatures.
- F. Warranty: Submit manufacturer warranty and ensure forms have been completed in Owner's name and registered with manufacturer.

1.5 QUALITY ASSURANCE

- A. Perform Work in accordance with NRCA Roofing and Waterproofing Manual for system.
- B. Membrane Manufacturer Qualifications: Company specializing in waterproofing sheet membranes with five years experience.
- C. Installer Qualifications: Company specializing in performing the work of this section for a minimum of 5 documented years and approved by manufacturer.

1.6 MOCK-UP

- A. Construct mock-up 100 sq ft of horizontal waterproofed panel; to represent finished work including internal and external corners.
- B. Locate where directed.
- C. Mock-up may remain as part of the Work.

SECTION 07140

FLUID-APPLIED WATERPROOFING

1.7 ENVIRONMENTAL REQUIREMENTS

- A. Maintain ambient temperatures above 60 degrees F for 48 hours before and during application and until cured unless otherwise directed by manufacturer and approved by Architect.

1.8 WARRANTY

- A. See Section 01780 - Closeout Submittals, for additional warranty requirements.
- B. Correct defective Work within a five year period after Date of Substantial Completion.
- C. Provide 15 year manufacturer total system warranty for waterproofing failing system components including membrane, flashing, protection course, drainage material and pavers.
- D. For warranty repair work, remove and replace materials concealing waterproofing.

PART 2 – PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturers:
 - 1. American Hydrotech, Inc.; Product Monolithic Membrane 6125: www.hydrotechusa.com.
 - 2. Carlisle Coatings & Waterproofing, Inc.; www.carlisle-ccw.com.
 - 3. Grace Construction Products; Product Procor: www.graceconstruction.com
 - 4. Substitutions: Not permitted.

2.2 MEMBRANE MATERIALS

- A. Fluid-Applied Waterproofing
 - 1. Capable of resisting water head of 20 feet and preventing moisture migration to interior.

2.3 ACCESSORIES

- A. General: Provide all accessories recommended by manufacturer for a full and complete installation for specific application.
- B. Surface Conditioner: Compatible with membrane compound; as recommended by membrane manufacturer.
- C. Sealant for Substrate Surfaces: As recommended by membrane manufacturer.
- D. Reinforcing:
 - 1. Spunbonded Polyester Fabric Reinforcing Sheet.
 - 2. 60 mil thick uncured neoprene reinforcing sheet.
- E. Protection Board: Rigid insulation specified in Section 07212.
- F. Drainage Panel: 3/8 inch thick formed plastic, embossed with cover sheet; manufactured by waterproofing manufacturer.
- G. Cant Strips: Premolded composition material.

PART 3 – EXECUTION

3.1 EXAMINATION

- A. Verify existing conditions before starting work.
- B. Verify substrate surfaces are free of frozen matter, dampness, loose particles, cracks, pits, projections, penetrations, or foreign matter detrimental to adhesion or application of waterproofing system.
- C. Verify that substrate surfaces are smooth, free of honeycomb or pitting, and not detrimental to full contact bond of waterproofing materials.
- D. Verify items which penetrate surfaces to receive waterproofing are securely installed.
- E. Verify that all conditions meet or exceed those recommended by waterproofing manufacturer prior to engaging Work of this section.

SECTION 07140

FLUID-APPLIED WATERPROOFING

3.2 PREPARATION

- A. Protect adjacent surfaces not designated to receive waterproofing.
- B. Remove existing water proofing by scarifying.
- C. Clean and prepare surfaces to receive waterproofing in accordance with manufacturer's instructions. Vacuum substrate clean.
- D. Do not apply waterproofing to surfaces unacceptable to manufacturer.
- E. Seal cracks and joints with sealant using methods recommended by sealant manufacturer.
- F. Install cant strips at inside corners.

3.3 INSTALLATION

- A. Apply surface conditioner at a rate recommended by manufacturer. Protect conditioner from rain or frost until dry.
- B. At joints and cracks less than 1/2 inch in width including joints between horizontal and vertical surfaces, apply 12 inch wide strip of neoprene joint cover sheet.
- C. At joints from 1/2 to 1 inch in width, loop joint cover sheet down into joint between 1-1/4 and 1-3/4 inch. Extend sheet 6 inches on either side of expansion joint.
- D. Center joint cover sheet over joints. Roll sheet into 1/8 inch coating of waterproofing material. Apply second coat over sheet extending minimum of 6 inches beyond sheet edges.
- E. Apply waterproofing in accordance with manufacturer's instructions.
 1. Apply the rubberized asphalt membrane at a rate to provide a continuous, monolithic coating of 90 mils minimum, into which is fully embedded a layer of spunbonded polyester fabric reinforcing sheet, followed by another continuous monolithic coat of membrane at a minimum thickness of 125 mils.
 2. Overlap reinforcing sheet a minimum of 3".
- F. Extend membrane up intersecting surfaces at membrane perimeter minimum 4 inches above horizontal surface.
- G. Apply extra thickness of waterproofing material at corners, intersections, and angles.
- H. Install flexible flashings and seal into waterproofing material. Seal items penetrating through membrane with flexible flashings.
- I. Extend waterproofing material into drain clamp flange, apply adequate coating of liquid membrane to assure clamp ring seal. Coordinate with drain installation in Section 15146.
- J. Seal membrane and flashings to adjoining surfaces. Install termination bar at all edges. Install counterflashing over all exposed edges.

3.4 INSTALLATION - DRAINAGE PANEL and PROTECTION BOARD

- A. Immediately after curing, dust membrane with tack-reducing surfacing at rate of approximately 10 lbs/100 sq ft.
- B. After membrane has cured, but before it becomes dusty, apply separation sheet. Lap joints to ensure complete coverage.
- C. Embed the protection course into the membrane while still viable to insure a good bond.
- D. Place drainage panel directly against membrane, butt joints, place to encourage drainage downward. Scribe and cut boards around projections, penetrations, and interruptions.
- E. Do not remove cover sheet from drainage panel for any reason. Panels installed without cover sheets will result in rejection of entire system for area affected.
- F. Place protection board directly against drainage panel; butt joints. Scribe and cut boards around projections, penetrations, and interruptions.
- G. Adhere protection board to substrate with compatible adhesive.

3.5 FIELD QUALITY CONTROL

- A. On completion of horizontal membrane installation, dam installation area in preparation for flood testing.
- B. Flood to minimum depth of 3 inch with clean water. After 48 hours, inspect for leaks.
- C. If leaking is found, remove water, repair leaking areas with new waterproofing materials as directed by Architect; repeat flood test. Repair damage to building.
- D. When area is proven watertight, drain water and remove dam.

SECTION 07140

FLUID-APPLIED WATERPROOFING

3.6 PROTECTION

- A. Do not permit traffic over unprotected or uncovered membrane.

3.7 SCHEDULE

END OF SECTION

SECTION 07211

FOAMED-IN-PLACE INSULATION

PART 1 – GENERAL

1.1 SUMMARY

- A. This section includes the following:
 - 1. Closed-cell, medium-density spray polyurethane foam insulation.
- B. Related Work in other Sections includes the following:
 - 1. Section 01400 - Quality Requirements; coordination with Owner's independent testing and inspection agency.
 - 2. Section 01400 - Mock-Ups; exterior wall mock-ups.
 - 3. Section 01500 - Temporary Facilities and Controls; requirement to schedule work to prevent sunlight and weather exposure of materials beyond limits established by manufacturer; requirement to protect materials from damage after installation and prior to installation of enclosing work.
 - 4. Section 03300 – Cast-In-Place Concrete; requirement that backup concrete be smooth without protrusions.
 - 5. Section 04810 – Unit Masonry; requirement that backup masonry joints are flush and completely filled with mortar, and that excess mortar on brick ties will be removed; requirement for gap at deflection joints and fillers; coordination with sequencing of through-wall flashing.
 - 6. Section 05400 – Cold-Formed Metal Framing; metal exterior wall framing assemblies to support the closed-cell, medium density sprayed polyurethane foam.

1.2 REFERENCES

- A. ASTM International:
 - 1. ASTM C518 Standard Test Method for Steady-State Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus.
 - 2. ASTM C1029 Standard Specification for Spray-Applied Rigid Cellular Polyurethane Thermal Insulation.
 - 3. ASTM C1338 Standard Test Method for Determining Fungi Resistance of Insulation Materials and Facings.
 - 4. ASTM D1621 Standard Test Method for Compressive Properties of Rigid Cellular Plastics.
 - 5. ASTM D1622 Standard Test Method for Apparent Density of Rigid Cellular Plastics.
 - 6. ASTM D1940 Method of Test for Porosity of Rigid Cellular Plastics.
 - 7. ASTM D2842 Standard Test Method for Water Absorption of Rigid Cellular Plastics.
 - 8. ASTM E84 Standard Test Method for Surface Burning Characteristics of Building Materials.
 - 9. ASTM E90 Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements.
 - 10. ASTM E96 Standard Test Methods for Water Vapor Transmission of Materials.
 - 11. ASTM E283 Standard Test Method for Determining Rate of Air Leakage.
 - 12. ASTM E413 Classification for Rating Sound Insulation.
 - 13. ASTM E2178 Standard Test Method for Air Permeance of Building Materials.
 - 14. ASTM E2357 Standard Test Method for Determining Air Leakage of Air Barrier Assemblies
- B. CAN/ULC
 - 1. CAN/ULC-S774-VOC emissions profiling by Dynamic Chamber Analysis
- C. NFPA
 - 1. NFPA 285 Standard Test Method for Evaluation of Fire Propagation Characteristics of Exterior Non-Load-Bearing Wall Assemblies Containing Combustible Components.
 - 2. NFPA 286 Standard Test Method of Fire Tests for Evaluating Contribution of Wall and Ceiling Interior Finish to Room Fire Growth
 - 3. Section 01500 - Temporary Facilities and Controls; requirement to schedule work to prevent sunlight and weather exposure of materials beyond limits established by manufacturer; requirement to protect materials from damage after installation and prior to installation of enclosing work.

SECTION 07211

FOAMED-IN-PLACE INSULATION

1.3 PERFORMANCE REQUIREMENTS

- A. Fire-Test-Response Characteristics: Provide insulation and related materials with the fire-test-response characteristics indicated, as determined by testing identical products per test methods indicated below or other testing and inspecting agency acceptable to authorities having jurisdiction. Identify materials with appropriate markings of applicable testing and inspecting agency.
 - 1. Surface Burning Characteristics (ASTM E84): 25 / 450.
 - 2. Assembly Fire Resistance Rating (NFPA 285): Passes NFPA 285 as part of an approved assembly.
 - 3. Combustion Characteristics (NFPA 286): Pass
- B. Material Performance: Provide materials which have an air permeance not to exceed 0.004 cubic feet per minute per square foot under a pressure differential of 0.3 in. water (1.57 pounds per square foot) [0.02 liters per second per square meter at a pressure difference of 75 Pascals (0.02 L/(s·m²) @ 75 Pa)] when tested in accordance with ASTM E 2178 (unmodified). The water vapor permeance shall be determined in accordance with ASTM E 96 and shall be declared by the manufacturer. (ABAA Certified projects only)
- C. Assembly Performance: Provide a continuous air barrier in the form of an assembly that has an air leakage not to exceed 0.040 cubic feet per square foot per minute under a pressure differential of 0.3 in. water (1.57 pounds per square foot) [0.20 liters per second per square meter at a pressure difference of 75 Pascals (0.20 L/(s·m²) @ 75 Pa)] when tested in accordance with ASTM E 2357. Assembly shall accommodate movements of building materials by providing expansion and control joints as required. Expansion / control joints, changes in substrate and perimeter conditions shall have appropriate accessory materials at such locations. (ABAA Certified projects only)
 - 1. Assembly shall be capable of withstanding combined design wind, fan and stack pressures, both positive and negative on the envelope without damage or displacement, and shall transfer the load to the structure.
 - 2. Assembly air barrier material shall not displace adjacent materials in the assembly under full load.
 - 3. Assembly shall be joined in an airtight and flexible manner to the air barrier material of adjacent assemblies, allowing for the relative movement of assemblies due to thermal and moisture variations, creep, and anticipated seismic movement.
- D. Adjacent Materials: Install closed-cell spray polyurethane foam to prevent air leakage at the following locations: (ABAA Certified projects only)
 - 1. Foundation and walls, including penetrations, ties and anchors.
 - 2. Walls, windows, curtain walls, storefronts, louvers and doors.
 - 3. Different assemblies and fixed openings within those assemblies.
 - 4. Wall and roof/ceiling connections.
 - 5. Floors over unconditioned space.
 - 6. Walls, floor and roof across construction, control and expansion joints.
 - 7. Walls, floors and roof to utility, pipe and duct penetrations.
 - 8. Seismic and expansion joints.
 - 9. All other potential air leakage pathways in the building envelope.

1.4 SUBMITTALS

- A. Submittals: Submit in accordance with Division 01 requirements.
- B. Product Data: Submit manufacturer's product data, manufacturer's instructions for evaluating, preparing, and treating substrate, temperature and other limitations of installation conditions, technical data, and tested physical and performance properties.
 - 1. Submit letter from primary materials manufacturer indicating approval of products not manufactured by primary manufacturer.
 - 2. Include statement that materials are compatible with adjacent materials proposed for use.
 - 3. Submit letter from the sealant manufacturer indicating sealant adhesion to the air barrier material meet the requirements of the project.

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- C. Samples: Submit clearly labeled samples, three inch by 4 inch (75 mm by 100 mm) minimum size of each material specified.
- D. Shop Drawings of Mock-Up: Submit shop drawings of proposed mock-ups showing plans, elevations, large-scale details, and connections to the test apparatus.
- E. Field Test Results of Mock-Up: Submit test results of air leakage test and water leakage test of mock-up in accordance with specified standards, including retesting if initial results are not satisfactory.
- F. Shop Drawings: Submit shop drawings showing locations and extent of air barrier assemblies and details of all typical conditions, intersections with other envelope assemblies and materials, membrane counter-flashings, and details showing how gaps in the construction will be bridged, how inside and outside corners are negotiated, how materials that cover the materials are secured with air-tight condition maintained, and how miscellaneous penetrations such as conduits, pipes, electric boxes and similar items are sealed.
 - 1. Include VOC content of each material, and applicable legal limit in the jurisdiction of the project.
 - 2. Include statement that materials are compatible with adjacent materials proposed for use.
 - 3. Include recommended values for field adhesion test on each substrate.
- G. Compatibility: Submit letter from manufacturer stating that materials proposed for use are permanently chemically compatible and adhesively compatible with adjacent materials proposed for use. Submit letter from manufacturer stating that cleaning materials used during installation are chemically compatible with adjacent materials proposed for use.
- H. Accredited Laboratory Testing for Materials: Laboratory accredited by International Accreditation Service Inc. (IAS), American Association for Laboratory Accreditation (A2LA), or the Standards Council of Canada (SCC).
- I. VOC Regulations: Provide products which comply with applicable regulations controlling the use of volatile organic compounds.
- J. Preconstruction Meeting: Convene a minimum of two weeks prior to commencing Work of this Section. Agenda shall include, at a minimum, construction and testing of mock-up, sequence of construction, coordination with substrate preparation, air barrier materials approved for use, compatibility of materials, coordination with installation of adjacent and covering materials, and details of construction and chemical/fire safety plans. Attendance is required by representatives of related trades including covering materials, substrate materials and adjacent materials.
- K. Mock-Ups: Build mock-up representative of primary assemblies and glazing assemblies including backup wall and typical penetrations as acceptable to the Architect. Mock-up shall be approximately 8 feet long by 8 feet high (2.5 meters long by 2.5 meters high) and include the materials and components proposed for use in the exterior wall assembly. Mock-up shall be suitable for testing as specified in the following paragraph. (ABAA Certified projects only)
- L. Mock-Up Tests for Air and Water Infiltration: Test mock-up for air and water infiltration in accordance with ASTM E 1186 (air leakage location), ASTM E 783 (air leakage quantification) at a pressure difference of 1.57 lb/ft² (75Pa) and ASTM E 1105 (water penetration). Use smoke tracer to locate sources of air leakage. If deficiencies are found, reconstruct mock-up and retest until satisfactory results are obtained. Deficiencies include air leakage beyond values specified, uncontrolled water leakage, unsatisfactory workmanship. (ABAA Certified projects only)
 - 1. Perform the air leakage test and water penetration test of mock-up prior to installation of cladding and trim but after installation of all fasteners for cladding and trim and after installation of other penetrating elements.

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- M. Mock-Up Tests for Spray Polyurethane Adhesion: Test mock-up of membrane for adhesion in accordance with ASTM D 4541 (modified) using a Type 1 pull tester except that the membrane shall be cut through to separate the material attached to the disk from the surrounding material. Perform test after curing period recommended by the manufacturer. Record mode of failure and area where the material failed in accordance with ASTM D 4541. When the air barrier material manufacturer has established a minimum adhesion level for the product on the particular substrate, the inspection report shall indicate whether this requirement has been met. Where the manufacturer has not declared a minimum adhesion value for their product/substrate combination, then the value shall simply be recorded. (ABAA Certified projects only)

1.5 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing urethane foam products and systems of this section with minimum ten years documented experience.
- B. Building Assembly Testing: A copy of the ASTM E 2357 test report showing drawings which identify the materials and photos of the assemblies tested, and the following results reported: air infiltration and exfiltration through the assembly at 0.3 inches water (75 Pa) both before and after pressure cycling, for both specimen one and specimen two.
- C. Regulatory Requirements and Approvals: IAPMO
1. Report Number: 146
- D. Mock-Ups: [Specify requirements for mock-up] Section
1. Section 01400 - Mock-Ups; exterior wall mock-ups.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Deliver materials to Project site in original packages with seals unbroken, labeled with manufacturer's name, product, date of manufacture, and directions for storage.
- B. Store materials in their original undamaged packages in a clean, dry, protected location and within temperature range required by air barrier spray foam manufacturer. Protect stored materials from direct sunlight.
- C. Handle materials in accordance with manufacturer's recommendations.

1.7 PROJECT CONDITIONS

- A. Temperature: Install closed-cell, medium density spray polyurethane foam air barrier within range of ambient and substrate temperatures recommended by air barrier manufacturer. Do not apply air barrier to a damp or wet substrate.
- B. Field Conditions: Do not install air barrier in snow, rain, fog, or mist. Do not install air barrier when the temperature of substrate surfaces and surrounding air temperatures are below those recommended by the manufacturer.
- C. Sequencing. Do not install air barrier material before the roof assembly has been sufficiently installed to prevent a buildup of water in the interior of the building.
- D. Compatibility. Do not allow closed-cell, medium density spray polyurethane foam to come in contact with chemically incompatible materials.
- E. Ultra-violet exposure. Do not expose the air barrier material to sunlight longer than as recommended by the manufacturer (if applicable).

1.8 WARRANTY

- A. Manufacturer's Warranty: Provide manufacturer's standard product warranty, for a minimum 1 year from date of Substantial Completion.
- B. Manufacturer's Warranty: Provide manufacturer's limited product warranty, for a maximum of 10 years from date of Substantial Completion.

SECTION 07211

FOAMED-IN-PLACE INSULATION

PART 2 – PRODUCTS

2.1 FOAMED-IN-PLACE INSULATION

- A. Basis of Design: Medium Density Closed Cell Spray Polyurethane Foam Air Barrier: JM Corbond III, manufactured by Johns Manville. Air barrier system shall not require the priming of substrates nor the application of sealing tape at wallboard seams and other wall penetrations.
1. Third Party Verification: IAPMO ES #0146.
 2. Application Rate: Up to 3.5 inches in a single pass, to the total thickness required for the project.
 3. Physical Properties:
 - a. Nominal Density (ASTM D1622): 2.0 lb/cu.ft.
 - b. Compressive Strength, 1 inch thickness (ASTM D1621): 36 psi.
 - c. Compressive Strength, 3 inch thickness (ASTM D1621): 30 psi.
 - d. Closed-Cell Content (ASTM D1940): Greater than 90 percent.
 - e. K-Factor (ASTM C518 initial): 0.15.
 - f. K-Factor (ASTM C1029 180-day aged): 0.16.
 - g. R-Value (ASTM C518 initial): 7.0.
 - h. R-Value (ASTM C1029 180-day aged): 7.0.
 - i. Water Absorption (ASTM D2842): 0.020 (gm/cc).
 - j. Water Vapor Transmission (ASTM E96): 0.61 perms at 1.5 inches.
 - k. Air Infiltration (ASTM E283): 75 Pa 0.001 L/S/m² (1.57 psf) (less than 0.001 cfm/ft²); 300 Pa 0.001 L/S/m² (6.24 psf) (less than 0.001 cfm/ft²).
 - l. Air Permeance (ASTM E2178): 75 Pa 0.000055 L/S.m².Pa 0.000117 ft³/min.mw.Pa; 300 Pa 0.000024 L/.m².Pa 0.000051 ft³/min.mw.Pa.
 - m. Sound Transmission Coefficient (STC) (ASTM E90 and ASTM E413): 36 STC; 2x4 wood stud, 16 inches on centers, 2.76 of JM Corbond III SPF, 15/32 inch exterior OSB sheathing, 1/2 inch gypsum wallboard.
 - n. Recycled Content of Side B: 10 percent (pre- and post-consumer).
- B. Transition Strip at Joint Between Wall and Foundation: Provide a minimum 40-mil self-adhering transition strip between the wall construction and the foundation to shed water to the exterior. Comply with both air barrier manufacturer's recommendations and material manufacturer's recommendations.
- C. Substitutions: See Section 01600 - Product Requirements.

2.2 ACCESSORIES

- A. Primer: As required by insulation manufacturer base on substrate materials and conditions.
- B. Thermal Barrier: Spray applied foam insulation must be separated from the interior of the building by an approved thermal barrier, such as 1/2-inch (min) gypsum wallboard, or an equivalent 15-minute thermal barrier complying with the applicable code. The alternative thermal barrier coating system shall be applied to the closed cell polyurethane foam insulation and tested to the criteria of NFPA 286, UL 1715 for duration of 15 minutes by an accredited fire testing facility and satisfies the International Building Code (IBC) requirements.
1. Alternative thermal barrier coating - Intumescent Coating: Subject to compliance with requirements of Contract Documents, products which may be incorporated into the Work include, but are not limited to, the following. Use only intumescent coatings approved by the respective polyurethane insulation manufacturer.
 - a. JM No-Burn Plus ThB intumescent coating; manufactured by NO-BURN, Inc.
 - b. Fireshell TC intumescent coating; manufactured by TPR2
 - c. DC315; manufactured by National Fireproof, Inc.
 2. Ignition Barrier: When the insulation is installed within an attic space where entry is made only for service of utilities, an ignition barrier must be installed in accordance with IBC. The ignition barrier must be consistent with the requirements for the type of construction required by the applicable code. The ignition barrier may be an intumescent coating identified above. Products which may be incorporated into the Work include, but are not limited to, the following:

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FOAMED-IN-PLACE INSULATION

- a. JM No-Burn Plus ThB intumescent coating; manufactured by NO-BURN, Inc.
3. JM Corbond III meets NFPA 286 criteria for various conditions and may be installed without a prescriptive ignition barrier in accordance with Sections 3.4.3.1, 3.4.3.2, 3.4.3.3 of IAPMO Evaluation Report 146.

PART 3 – EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions under which the air barrier assembly will be installed, with Installer present, for compliance with requirements.
 1. Verify that surfaces and conditions are suitable prior to commencing work of this section. Do not proceed with installation until unsatisfactory conditions have been corrected.
 2. Ensure that the following conditions are met:
 - a. Surfaces are sound, dry, even, and free of oil, grease, dirt, excess mortar or other contaminants
 - b. Concrete surfaces are cured and dry, smooth without large voids or sharp protrusions.
 - c. Masonry joints are reasonably flush, and all excess mortar sitting on masonry ties has been removed.
 3. Verify substrate is visibly dry and free of moisture. Test for capillary moisture by plastic sheet method according to ASTM D 4263 and take suitable measures until substrate passes moisture test.
 4. Verify sealants are compatible with membrane proposed for use. Perform field peel-adhesion test on materials to which sealants are adhered.
 5. Notify Architect in writing of anticipated problems using closed-cell, medium density spray polyurethane foam over substrate prior to proceeding.

3.2 SURFACE PREPARATION

- A. Clean, prepare, and treat substrate according to manufacturer's written instructions. Provide clean, dust-free, and dry substrate for air barrier application.
 1. Ensure that penetrating work by other trades is in place and complete.
 2. Prepare surfaces by brushing, scrubbing, scraping, grinding or compressed air to remove loose mortar, dust, oil, grease, oxidation, mill scale and other contaminants which will affect adhesion of the closed-cell, medium density spray polyurethane foam.
 3. Where there are release agents or other non-compatible coatings, wipe down metal surfaces to remove these release agents or other non-compatible coatings, using clean sponges or rags soaked in a solvent compatible with the spray polyurethane foam.
 4. Ensure veneer anchors are in place.
- B. Protection from Spray Applied Materials:
 1. Mask and cover adjacent areas to protect from overspray.
 2. Ensure any required foam stop or back up material are in place to prevent over spray and achieve complete seal.
 3. Seal off existing ventilation equipment. Install temporary ducting and fans to ensure exhaust fumes. Provide for make-up air.
 4. Erect barriers, isolate area and post warning signs to advise non-protected personnel to avoid the spray area.

3.3 INSTALLATION

- A. Spray Polyurethane Foam Installation: Install materials in accordance with manufacturer's recommendations, ULC S 705.2 and the following:
 1. Apply only after transition strip at foundation and wall intersection has been installed.
 2. Installer shall use proper personal protective equipment (PPE) during the installation of material in accordance with US Government regulation 29 CFR 1910.134.
 3. Warning signs shall be displayed and non-protected personnel shall be kept from the spray area in accordance with ULC S705.2.

SECTION 07211

FOAMED-IN-PLACE INSULATION

4. Equipment used to spray polyurethane foam shall comply with ULC S 705.2 and the manufacturer's recommendations for the specific type of application. Record equipment settings on the Daily Work Record as required by the ULC S 705.2 installation standard. Each proportioner unit shall supply only one spray gun.
5. Apply only when surfaces and environmental conditions are within limits prescribed by the material manufacturer or the ULC S 705.2 Installation standard.
6. Apply in consecutive passes as recommended by manufacturer to thickness as indicated on drawings. Passes shall be not less than 1/2 inch (12 mm) and not greater than 3.5 inches (75 mm). An additional pass shall only be done after the first pass has had time to cool down.
7. Install within manufacturer's tolerances, but not more than minus 1/4 inch (6 mm).
8. Do not install spray polyurethane foam within 3 inches (75 mm) of heat emitting devices such as light fixtures and chimneys.
9. Finished surface of foam insulation to be free of voids and embedded foreign objects.
10. Remove masking materials and over spray from adjacent areas immediately after foam surface has hardened. Ensure cleaning methods do not damage work performed by other sections.
11. Trim, as required, any excess thickness that would interfere with the application of cladding/covering system by other trades.
12. Clean and restore surfaces soiled or damaged by work of the section. Consult with section of work soiled before cleaning to ensure methods used will not damage the work.
13. Complete connections to other components and repair any gaps, holes or other damage using material which conforms to ULC S 710.1 (single component) or ULC S 711.1 (two components) and installed in accordance with ULC S 710.2 or ULC S 711.2 as applicable.

3.4 FIELD QUALITY CONTROL

- A. Owner's Inspection and Testing: Cooperate with Owner's testing agency. Allow access to work areas and staging. Notify Owner's testing agency in writing of schedule for Work of this Section to allow sufficient time for testing and inspection. Do not cover Work of this Section until testing and inspection is accepted.

3.5 PROTECTING AND CLEANING

- A. Protect material from damage during installation and the remainder of the construction period, according to manufacturer's written instructions.
 1. Coordinate with installation of materials which cover the air barrier assemblies, to ensure exposure period does not exceed that recommended by the manufacturer.
- B. Clean spillage and soiling from adjacent construction using cleaning agents and procedures recommended by manufacturer of affected construction and acceptable to the primary material manufacturer.

END OF SECTION

SECTION 07212

BOARD AND BATT INSULATION

PART 1 – GENERAL

1.1 SECTION INCLUDES

- A. Board insulation and integral vapor retarder at cavity wall construction and perimeter foundation wall.
- B. Protection Board insulation for sheet water proofing applications.
- C. Batt insulation and vapor retarder in exterior wall, ceiling, and roof construction.
- D. Batt insulation for filling perimeter window and door shim spaces and crevices in exterior wall and roof.

1.2 RELATED SECTIONS

- A. Section 03300 - Cast in Place Concrete: perimeter insulation.
- B. Section 04810 - Unit Masonry Assemblies: Insulation for Cavity spaces.
- C. Section 09260 - Gypsum Board Assemblies: Acoustic insulation.

1.3 REFERENCES

- A. ASTM C578 - Preformed, Cellular Polystyrene Thermal Insulation.
- B. ASTM C 665 - Standard Specification for Mineral-Fiber Blanket Thermal Insulation for Light Frame Construction and Manufactured Housing; 2001.
- C. ASTM D 2842 - Standard Test Method for Water Absorption of Rigid Cellular Plastics; 2001.
- D. ASTM E 84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2001.
- E. ASTM E 96 - Standard Test Methods for Water Vapor Transmission of Materials; 2000.

1.4 SYSTEM DESCRIPTION

- A. Materials of This Section: Provide continuity of thermal barrier at building enclosure.
- B. Materials of This Section: Provide thermal protection to vapor retarder in conjunction with vapor retarder materials in Section 07260.

1.5 SUBMITTALS

- A. See Section 01300 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide data on product characteristics, performance criteria, and product limitations, ASTM Test Compliance and data.
 - 1. Provide product data on all materials and accessories comprising a complete installation including but not limited to all adhesives, clips and other accessories.
- C. Manufacturer's Installation Instructions: Include information on special environmental conditions required for installation and installation techniques.
- D. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.

1.6 ENVIRONMENTAL REQUIREMENTS

- A. Do not install insulation adhesives when temperature or weather conditions are detrimental to successful installation.

1.7 SEQUENCING

- A. Sequence work to ensure fireproofing, firestop, vapor retarder, air barrier, and other related materials are in place before beginning work of this section.
- B. Protection Board for Waterproofing: Provide complete installation of all waterproofing membrane, drainage and all related accessories. Allow Architect access to waterproofing for review prior to installing protection board or backfilling. Complete any remedial work as directed by Architect.

1.8 COORDINATION

- A. Coordinate work under provisions of Section 01300
- B. Coordinate the work with Section 07260 for installation of vapor retarder.

SECTION 07212

BOARD AND BATT INSULATION

PART 2 – PRODUCTS

2.1 BOARD INSULATION MATERIALS

- A. Extruded Polystyrene Board Insulation: Extruded polystyrene board with natural skin surfaces; with the following characteristics relative to application:
1. Cavity wall applications; ASTM C 578 type IV.
 - a. Board Size: 48 x 96 inch with 16 inch perforations for horizontal reinforcing applications.
 - b. Board Thickness: 1-1/2 inches.
 - c. Board Edges: Square.
 - d. Thermal Resistance of 1 inch thickness at 25 degrees F: 5.6 minimum.
 - e. Compressive Resistance: Min. 50 psi.
 - f. Board Density: 1.6 lb/cu ft.
 - g. Water Absorption, maximum: 0.3 percent, volume.
 2. Foundation or below grade applications; ASTM C 578 type VI.
 - a. Board Size: 24 x 96 inch.
 - b. Board Thickness: 2 inches.
 - c. Board Edges: Square.
 - d. Thermal Resistance of 1 inch thickness at 25 degrees F: 5.6 minimum.
 - e. Compressive Resistance: 60 psi.
 - f. Board Density: 1.8 lb/cu ft.
 - g. Water Absorption, maximum: 0.3 percent, volume.
 3. Protection Board for Sheet Waterproofing below grade applications; ASTM C 578 type VI.
 - a. Board Size: 48 x 96 inch or 24 x 96 inch.
 - b. Board Thickness: 1/2 inches minimum.
 - c. Board Edges: Square.
 - d. Thermal Resistance of 1 inch thickness at 25 degrees F: 5.6 minimum.
 - e. Compressive Resistance: 40 psi minimum for thickness stated.
 - f. Board Density: 1.8 lb/cu ft.
 - g. Water Absorption, maximum: 0.3 percent, volume.
 4. Manufacturers:
 - a. Dow Chemical Co: www.dow.com.
 - b. Owens Corning Corp: www.owenscorning.com.
 - c. Pactiv Building Products formerly Tenneco Building Product 2907 Log Cabin Drive Smyrna, Georgia 30080-7013 800-241-4402 .
 - d. Substitutions: See Section 01600 - Product Requirements.

2.2 MANUFACTURERS - ADHESIVES

- A. As manufactured and recommended by insulation manufacturer.
- B. Chem Rex, Inc., "Contact Brand PL300 Foam Board Adhesive."
- C. Dacar Products, In., "Foamgrab PS."
- D. Substitutions: Not permitted.

2.3 BATT INSULATION MATERIALS

- A. Batt Insulation: ASTM C 665; preformed glass fiber batt; friction fit, conforming to the following:
1. Manufacturers:
 - a. CertainTeed Corporation: www.certainteed.com.
 - b. Johns Manville Corporation: www.jm.com.
 - c. Owens Corning Corp: www.owenscorning.com.
 2. Substitutions: See Section 01600 - Product Requirements.

SECTION 07212

BOARD AND BATT INSULATION

2.4 ACCESSORIES

- A. Sheet Vapor Retarder Type 1: Black polyethylene film for above grade application, 10 mil mil thick.
- B. Tape: Bright aluminum self-adhering type, mesh reinforced and 2 inch wide.
- C. Insulation Fasteners: Impaling clip of unfinished steel with washer retainer and clips, to be adhered to surface to receive board insulation, length to suit insulation thickness and substrate, capable of securely and rigidly fastening insulation in place.

PART 3 – EXECUTION

3.1 EXAMINATION

- A. Verify site conditions under provisions of Section 01300.
- B. Verify that substrate, adjacent materials, and insulation materials are dry and that substrates are ready to receive insulation and adhesive.
- C. Verify substrate surfaces are flat, free of honeycomb, fins, irregularities, or materials or substances that may impede adhesive bond.

3.2 BOARD INSTALLATION AT FOUNDATION PERIMETER

- A. Adhere a 6-inch wide strip of polyethylene sheet over construction, control, and expansion joints with double beads of adhesive each side of joint.
- B. Apply adhesive to back of boards:
 - 1. Three continuous beads per board length.
 - 2. Full bed 1/8 inch thick.
- C. Install boards horizontally on foundation perimeter.
- D. Place boards to maximize adhesive contact.
- E. Install in running bond pattern.
- F. Stagger side joints.
- G. Butt edges and ends tightly to adjacent boards and to protrusions.
- H. Extend boards over control and expansion joints, un-bonded to foundation 8 inches on one side of joint.
- I. Cut and fit insulation tightly to protrusions or interruptions to the insulation plane.
- J. All Boards to extend a minimum of 24" below outside grade.

3.3 BOARD INSTALLATION AT CAVITY WALLS

- A. Adhere a 6-inch wide strip of polyethylene sheet over expansion joints with double beads of adhesive each side of joint.
 - 1. Extend sheet full height of joint.
- B. Install using adhesive recommended by insulation manufacturer for application. Apply adhesive to back of boards:
 - 1. Three continuous beads per board length.
 - 2. Full bed 1/8 inch thick.
- C. Install boards to fit snugly between wall ties.
 - 1. Place membrane surface facing out, and tape seal board joints.
- D. Install boards horizontally on walls.
 - 1. Place boards to maximize adhesive contact.
 - 2. Install in running bond pattern.
 - 3. Butt edges and ends tightly to adjacent boards and to protrusions.
 - 4. Place impale fastener locking discs.
- E. Cut and fit insulation tightly to protrusions or interruptions to the insulation plane.

3.4 PROTECTION OF UNFINISHED WORK

- A. Do not permit work to be damaged prior to covering insulation.

SECTION 07212

BOARD AND BATT INSULATION

3.5 BATT INSTALLATION

- A. Install insulation and vapor retarder in accordance with manufacturer's instructions.
- B. Install in exterior wall and roof spaces without gaps or voids. Do not compress insulation.
- C. Trim insulation neatly to fit spaces. Insulate miscellaneous gaps and voids.
- D. Fit insulation tightly in cavities and tightly to exterior side of mechanical and electrical services within the plane of the insulation.
- E. Install with factory applied vapor retarder membrane facing warm side of building spaces. Lap ends and side flanges of membrane over framing members.
- F. Staple facing flanges in place at maximum 6 inches on center.
- G. Tape seal butt ends, lapped flanges, and tears or cuts in membrane.
- H. At metal framing, place vapor retarder on warm side of insulation; lap and seal sheet retarder joints over member face.
- I. Tape seal tears or cuts in vapor retarder.
- J. Extend vapor retarder tightly to full perimeter of adjacent window and door frames and other items interrupting the plane of the membrane. Tape seal in place.

3.6 PROTECTION OF FINISHED WORK

- A. Do not permit installed insulation to be damaged prior to its concealment.

END OF SECTION

SECTION 07272

FLUID APPLIED MEMBRANE AIR BARRIERS, VAPOR-RETARDING

PART 1 – GENERAL

1.1 SECTION INCLUDES

- A. Surface preparation.
- B. Application of liquid-applied, vapor-retarding air barrier.
- C. Application of materials to bridge and seal air leakage pathways in the following conditions:
 - 1. Wall-to-roof connections and penetrations.
 - 2. Wall-to-foundation connections.
 - 3. Windows, curtain walls, storefronts, louvers and door penetrations.
 - 4. Expansion and control joints.
 - 5. Masonry ties.
 - 6. All other penetrations through the wall assembly.

1.2 RELATED SECTIONS

- A. Section 04810 – Unit Masonry Assemblies.
- B. Section 07212 – Board and Batt Insulation.
- C. Section 07531 – Single Ply Roofing – Fully Adhered EPDM
- D. Section 07620 – Sheet Metal Flashing and Trim.
- E. Section 07840 – Firestopping.
- F. Section 07920 – Joint Sealers
- G. Section 08110 – Steel Door and Frames

1.3 REFERENCES

- A. ASTM D412 - Standard Test Methods for Vulcanized Rubber and Thermoplastic Elastomers-Tension.
- B. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials.
- C. ASTM E283 - Standard Test Method for Determining the Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen.
- D. ASTM E783 - Standard Test Method for Field Measurement of Air Leakage Through Installed Exterior Windows and Doors.
- E. ASTM E1105 - Standard Test Method for Field Determination of Water Penetration of Installed Exterior Windows, Skylights, Doors, and Curtain Walls by Uniform or Cyclic Static Air Pressure Difference.
- F. ASTM E2178 - Standard Test Method for Air Permeance of Building Materials.
- G. ASTM E2357 - Standard Test Method for Determining Air Leakage of Air Barrier Assemblies.

1.4 SUBMITTALS

- A. See Section 01300 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide data for membrane and surface conditioner.
- C. Shop Drawings: Indicate special joint or termination conditions and conditions of interface with other materials.
- D. Certificate: Certify that products meet or exceed specified requirements.
- E. Manufacturer's Installation Instructions: Indicate special procedures, perimeter conditions requiring special attention, and acceptable installation temperatures.
- F. Warranty: Submit manufacturer warranty and ensure forms have been completed in Owner's name and registered with manufacturer.

1.5 QUALITY ASSURANCE

- A. Use an experienced installer and adequate number of skilled personnel who are thoroughly trained and experienced in the application of the air barrier.
- B. Air Barrier Installer performing Work shall be approved by air barrier membrane manufacturer.
- C. Obtain air barrier materials from a single manufacturer regularly engaged in manufacturing the product.

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FLUID APPLIED MEMBRANE AIR BARRIERS, VAPOR-RETARDING

1.6 MOCK-UP

- A. Prior to installation of air barrier, apply air barrier as follows to verify details under shop drawing submittals and to demonstrate tie-ins with adjoining construction, and other termination conditions, as well as qualities of materials and execution.
- B. Construct typical exterior wall panel, 8 feet (2.4 m) long by 8 feet (2.4 m) wide, incorporating back-up wall, cladding, insulation, flashing; illustrating materials interface and seals.
- C. Do not cover any installed air barrier membrane unless it has been inspected, tested, and approved.
- D. Mockup may remain as part of the Work.

1.7 ENVIRONMENTAL REQUIREMENTS

- A. Cover air barrier no later than 4 months after application. Longer term exposure increases potential for UV degradation and physical damage.
- B. Do not proceed with product application if rainfall is forecast or imminent within 12 hours.
- C. Do not apply when air, material and surface temperatures are expected to fall below 20 degrees F (-6.7 degrees C) within 24 hours of completed application.

1.8 WARRANTY

- A. See Section 01780 - Closeout Submittals, for additional warranty requirements.
- B. Correct defective Work within a five-year period after Date of Substantial Completion.
- C. Provide five year manufacturer warranty for waterproofing failing to resist penetration of water.
- D. For warranty repair work, remove and replace materials concealing waterproofing.

PART 2 – PRODUCTS

2.1 MANUFACTURERS

- A. Acceptable Manufacturers:
 1. Basis of Design: W. R. MEADOWS®, INC., 300 Industrial Drive / PO Box 338, Hampshire, Illinois 60140-0338. (800) 342-5976, Website: www.wrmeadows.com.
 2. Carlisle Coatings and Waterproofing, Sapulpa, OK 74067
 3. Mirafi, Norcross, GA 30092
 4. Substitutions: See Section 01600 - Product Requirements.

2.2 MEMBRANE MATERIALS

- A. Basis of Design: AIR-SHIELD LSR by W. R. MEADOWS.
- B. Liquid-Applied, Vapor-Retarding Air Barrier System: Single-component, liquid synthetic rubber, asphalt-free and vapor-retarding air barrier membrane.
 1. Performance Based Specification: Vapor-retarding air barrier membrane shall have the following characteristics:
 - a. Color: Sprays pink, dries to desert tan.
 - b. Minimum Application Temperature: 20 degrees F (-6.7 degrees C).
 - c. Air Permeability, ASTM E2178: <0.004 cfm / ft2 @ 75 Pa (1.57 lbs. / ft2).
 - d. Air Barrier Assembly, ASTM E2357: <0.04 cfm / ft2 @ 75 Pa (1.57 lbs. / ft2).
 - e. Water Vapor Permeance, ASTM E96 (Method B): ≤ 0.1 perms.
 - f. Elongation, ASTM D412: 700 %.
 - g. Tensile Strength, ASTM D412: 250 psi.
 - h. Nail Sealability, ASTM D1970: Pass.
 - i. Maximum Service Temperature: 175 degrees F (80 degrees C).
 - j. Flexibility at -15 degrees F (-26 degrees C) ASTM C836 2-inch mandrel: Pass.
 - k. Flame Spread and Smoke Development, ASTM E84: Class A.
 - l. Flame Propagation Testing, NFPA 285: Complies with various assemblies.
 - m. VOC Content: 138 g/L.

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FLUID APPLIED MEMBRANE AIR BARRIERS, VAPOR-RETARDING

2.3 ACCESSORIES

- A. Transition Membrane and Flashing: 40-mil self-adhesive polymeric membrane for reinforcement of joints, inside and outside corners and dissimilar material connections.
- B. Through-Wall Flashing: 40-mil self-adhesive polymeric sheet membrane.
- C. Liquid Flashing: Fluid-applied, single-component, flashing membrane reinforcement of joints, inside and outside corners and dissimilar material connections.
- D. Alternate Flashing: 40-mil self-adhesive polymeric sheet flashing membrane with aluminum facer for use at door and window openings.
- E. Joint Reinforcing Fabric: Spun-bonded polyester fabric for reinforcement of flat joints and corner conditions with primary fluid-applied membrane.
- F. Membrane Adhesive/Primer:
 - 1. Temperatures above 40 F degrees F (4 degrees C): Water-Based Adhesive
 - a. MEL-PRIME™ W/B Water-Based Adhesive by W. R. MEADOWS (Basis of Design).
 - 2. Temperatures below 30 degrees F (-1 degrees C): Solvent-Based Primer.
 - a. MEL-PRIME VOC-Compliant Solvent-Base Adhesive or Standard Solvent-Base Adhesive by W. R. MEADOWS (Basis of Design).
- G. Pointing Mastic: mastic for sealing penetrations and terminations of membrane.
- H. Termination Sealant: non-slump waterproofing material for joint detailing.
- I. Concrete Repair Materials: general purpose patching materials.
- J. Termination Bar: optional termination for through-wall flashing membrane.

PART 3 – EXECUTION

3.1 EXAMINATION

- A. Examine surfaces to receive membrane are deemed appropriate in accordance with air barrier manufacturer's current technical literature.
- B. Notify Architect if surfaces are not acceptable. Do not begin surface preparation or application until unacceptable conditions have been corrected.
- C. Start of the Work shall construe installer acceptance of substrates and conditions.

3.2 PREPARATION

- A. Protect adjacent surfaces not designated to receive air barrier.
- B. Clean and prepare surfaces to receive air barrier membrane in accordance with manufacturer's instructions.
- C. Ensure all areas to receive joint treatment, reinforcement and membrane application are clean, dry, smooth, and free from all bond-breaking contaminants. Remove and replace any damaged structural substrate components.
- D. Do not apply membrane system to surfaces unacceptable to manufacturer.
- E. All surfaces to receive fluid-applied membrane air barrier system must be clean, free of standing water, ice, snow, frost, dust, dirt, oil, curing compounds, or any other foreign material detrimental to proper adhesion of the membrane.
- F. Prefill all bug holes on concrete and masonry with appropriate cementitious patching mortar. Strike masonry joints flush.
- G. Patch all cracks, small voids, offsets, irregularities, and small deformities on concrete and masonry surfaces with appropriate cementitious patching mortar at least two hours before application. Eliminate all sharp protrusions and fins in cast-in-place concrete.

3.3 INSTALLATION - MEMBRANE

- A. Prime surfaces to receive self-adhering membranes within one working day with applicable primer. Areas not covered within one day shall be re-primed. Ensure primer extends a minimum of 1-inch (25.4 mm) beyond area to receive self-adhering membranes.
- B. Crack and Joint Treatment of Cast-in-Place Concrete:
 - 1. Prefill nonmoving 1/16 inch to ¼-inch (1.6 mm – 3.2 mm) cracks and joints with termination sealant, mastic or liquid flashing and tool smooth, ensuring 1-inch coverage to both sides.

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FLUID APPLIED MEMBRANE AIR BARRIERS, VAPOR-RETARDING

2. Prefill nonmoving 1/4 inch to 1-inch (6.4 mm – 25.4 mm) cracks and joints with termination sealant, mastic or liquid flashing and allow to cure. Apply and tool smooth liquid flashing 3-inches (76.2 mm) band beyond both sides of the joint area. Alternatively, apply a 4-inch-wide (101.6 mm) section of self-adhered transition membrane, centered over joint.
- C. Dissimilar Material Connections:
1. Connect joints between dissimilar building materials with a 6-inch-wide (152.4 mm) section of self-adhering transition membrane, centered over the dissimilar material joint.
 2. Alternatively, apply an 8-inch-wide (203.2 mm) band of liquid flashing, centered over the joint between material joint.
- D. Exterior Sheathing Panels:
1. Install and fasten exterior wood sheathing panels according to the sheathing manufacturer's instructions. Install and fasten exterior gypsum panels in accordance with manufacturer's instructions and ASTM C1280.
 2. Cover all fastener heads and removed fastener holes with termination sealant, mastic or liquid flashing.
 3. Joint Treatment with Termination Sealant:
 - a. Prefill flat joints up to 1/4 inch (6.4 mm) with joint termination sealant and strike flush with both sides of the exterior sheathing panels.
 - b. Allow joint sealant to cure for a minimum of 24 hours prior to proceeding with full application of air barrier membrane.
 4. Joint Treatment with Liquid Flashing
 - a. Prefill flat joints up to 1/4 inch (6.4 mm) with liquid flashing and strike flush with both sides of the exterior sheathing panels.
 - b. Prefill joints greater than 1/4 inch (6.4 mm) but not greater than 1/2 inch (12.8 mm) with liquid flashing and allow to become firm. Apply liquid flashing extending 3-inches (76.2 mm) from the center of the joint onto both sides of the exterior sheathing panels.
 - c. Run the spreader tool over the liquid flashing to remove inconsistencies.
 5. Joint Treatment with Self-Adhesive Membrane
 - a. Prime both sides of the joint extending 3 inch (76.2 mm) from the center with the required primer/adhesive.
 - b. Apply a 4-inch (25.4 mm) wide strip of self-adhesive membrane centered over the joint and roll press firmly into place.
 - c. Fill all joints wider than 1/4 inch (6.4 mm) with termination sealant prior to application of self-adhesive membrane.
 6. Joint Treatment with Fluid-Applied Membrane
 - a. Fill joint area with fluid applied membrane using a spreader tool or putty knife.
 - b. Apply fluid applied membrane extending beyond the joint line 3-inch (76.2 mm) onto face of exterior sheathing.
 - c. Fully embed the reinforcing fabric 3-inch (76.2 mm) wide into the wet fluid applied membrane centered over the joint.
 - d. Run the spreader tool or putty knife over the embedded reinforcing fabric to remove any air bubbles.
- E. Inside and Outside Corners:
1. Apply a 6-inch-wide (152.4 mm) section of self-adhering transition membrane flashing or liquid flashing onto properly prepared substrates at the center of inside and outside corners. Ensure a 2-inch (50.8 mm) overlap of successive sections.
 2. Roll all areas of membrane with roller ensuring full adhesion. Eliminate all wrinkles and fish-mouths.
 3. Alternatively, apply liquid flashing at the center of inside and outside corners, ensuring a minimum 3-inch (76.2 mm) lap onto each adjacent plane.
- F. Through-Wall Flashing:
1. Apply self-adhering through-wall flashing a minimum 8 inches (203.2 mm) onto properly primed backup wall substrates. Ensure through-wall flashing is recessed 1/2-inch (12.7 mm) from exterior face of masonry cladding.

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2. Overlap successive sections of through-wall flashing 4 inches (101.6 mm) and apply termination sealant or mastic to each lap. Seal overlapped seams with mastic.
 3. Roll all areas of through-wall flashing to ensure full adhesion.
 4. Apply a bead of termination sealant or mastic onto horizontal leading edges and tool smooth to permit water shedding.
- G. Primary Fluid-Applied Membrane Air Barrier Installation:
1. Apply air barrier membrane in accordance with manufacturer's instructions.
 2. Thoroughly mix membrane prior to application while avoiding air entrapment.
 3. Apply membrane by spray or roller to provide a uniform thickness of 75 wet mils.
 4. Overlap fluid-applied air barrier 2 inches (50.8 mm) onto the leading edges of transition membranes and flashings.
 5. Regularly inspect surface area with a wet mil gauge to ensure consistent thickness.
 6. Cured thickness of membrane should be 40 mils dry.
 7. Allow 48 hours for full cure of the membrane.

3.4 PROTECTION

- A. Cover air barrier as soon as possible after application, as air barrier is not intended for permanent exposure.

END OF SECTION

SECTION 07410

PREFORMED METAL WALL PANELS

PART 1 – GENERAL

1.1 DESCRIPTION OF WORK

- A. This section covers the pre-finished, pre-fabricated Architectural metal wall panel system. All metal trim, accessories, fasteners, insulation and sealants indicated on the drawings as part of this section.
- B. Drawings and general provisions of the Contract, including general and Supplementary Conditions and Division 01 Specifications, apply to this section.

1.2 SUMMARY

- A. Section Includes
 - 1. Factory formed metal wall panels
- B. Related work specified elsewhere.
 - 1. Section 05310 – Steel Deck: Division 5 - Metal Deck Sections
 - 2. Section 06114 – Wood Blocking and Curbing
 - 3. Section 07620 – Sheet Metal Flashing and Trim
 - 4. Section 07900 – Joint Sealers

1.3 DEFINITIONS

- A. Metal Wall Panel Assembly: Metal wall panels, attachment system components, miscellaneous metal framing, thermal, and accessories necessary for a complete weathertight system.

1.4 QUALITY ASSURANCE

- A. Petersen Aluminum Corp, Elk Grove Village, IL, 800-323-1960 products establish a minimum of quality required.
- B. Manufacturer and erector shall demonstrate experience of a minimum of five (5) years in this type of project.
- C. Sheet Metal Industry Standard: Comply with Sheet Metal and Air Conditioning Contractors National Association (SMACNA) Architectural Sheet Metal Manual.
- D. Panels shall be factory-produced only. No portable, installer-owned or installer-rented machines will be permitted.

1.5 SUBSTITUTIONS

- A. The material, products and equipment specified in this section establish a standard for required function, dimension, appearance and quality to be met by any proposed substitution.

1.6 SYSTEM DESCRIPTION

- A. Material to comply with:
 - 1. ASTM A792/A792M Standard Specification for Sheet Steel, 55% Aluminum-Zinc Alloy Coated by the Hot-Dip process

1.7 ROOF SYSTEM PERFORMANCE TESTING

- A. General Performance: Metal wall panels shall comply with performance requirements without failure due to defective manufacture, fabrication, installation or other defects in construction.
- B. Panels to meet:
 - 1. Metal Wall or Metal Soffit System shall be designed to meet applicable Local Building Code and the Soffit System shall have been tested by the Manufacturer per ASTM E-330 and have the applicable Load Tables published from this Air Bag testing for negative loads.

1.8 WARRANTIES

- A. Finish warranty: Manufacturer's standard form in which manufacturer agrees to repair finish or replace metal wall panels that show evidence of deterioration of factory-applied finish within specified warranty period.
 - 1. Exposed Panels Finish - deterioration includes the following:
 - a. Color fading more than 5 hunter units when tested according to ASTM D 2244

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PREFORMED METAL WALL PANELS

- b. Chalking in excess of a No. 8 rating when tested according to ASTM D 4214
- c. Cracking, checking, peeling or failure of a paint to adhere to a bare metal.
- 2. Warranty Period: 20 Years from the date of substantial completion
- B. Applicator shall furnish written warranty for a two (2) year period from date of substantial completion of building covering repairs required to maintain roof and flashings in watertight condition

1.9 SUBMITTALS

- A. Furnish detailed drawings showing profile and gauge of exterior sheets, location and type of fasteners, location, gauges, shape and method of attachment of all trim locations and types of sealants, and any other details as may be required for a weather-tight installation.
- B. Provide finish samples of all colors specified.
- C. Shop drawings: Show fabrication and installation layouts of metal wall panels or metal soffit panels, details of edge conditions, panel profiles, corners, anchorages, trim, flashings, closures and accessories, and special details. Distinguish between factory and field-assembled work
- D. Coordination Drawings: Plans, drawn to scale, on which the following are shown and coordinated with each other, based on input from installer of the items involved.

1.10 DELIVERY, STORAGE AND HANDLING

- A. Ordering: Comply with manufacturer's ordering instructions and lead time requirements to avoid construction delays.
- B. Deliver components, sheets, metal wall panels and other manufactured items so as not to be damaged or deformed. Package metal wall panels for protection during transportation and handling.
- C. Unload, store and erect metal wall panels in a manner to prevent bending, warping, twisting and surface damage.
- D. Stack metal wall panels on platforms or pallets, covered with suitable weathertight and ventilated covering. Store metal wall panels to ensure dryness. Do not store metal wall panels in contact with other materials that might cause staining, denting or other surface damage.
- E. Protect strippable protective coating on any metal coated product from exposure to sunlight and high humidity, except to the extent necessary for material installation.

1.11 PROJECT CONDITIONS

- A. Weather Limitations: proceed with installation only when existing and forecasted weather conditions permit metal wall panel work to be performed.
- B. Field Measurements: Verify actual dimensions of construction contiguous with metal roof panels by field measurements before fabrication.

PART 2 – PRODUCTS

2.1 PANEL DESIGN

- A. General: Provide factory-formed metal wall panels designed for wall, soffit and fascia applications where a flush or flat appearance is desired. A round interlock leg and concealed fastening system act to improve the flush appearance while providing additional strength.
- B. Horizontal Soffit Panel shall be PAC 750 with ½" depth.
- C. Panels to be produced Smooth - Factory Standard.
- D. Forming: Use continuous end rolling method. No end laps on panels. No portable rollforming machines will be permitted on this project, no installer-owned or installer-rented machines will be permitted. It is the intent of the Architect to provide Factory-Manufactured panel systems only for this project.

SECTION 07410

PREFORMED METAL WALL PANELS

2.2 ACCEPTABLE MANUFACTURERS

- A. Basis of Design: Metal wall product of Petersen Aluminum Corp, Elk Grove Village, IL, 800-323-1960, Flush Wall Panel.
- B. Substitutions: See Section 01600 - Product Requirements.

2.3 MATERIALS AND FINISHES

- A. Preformed metal panels shall be fabricated of 22 GA, and shall be Herr-Voss corrective leveled for flat appearance.
- B. Color shall be **STANDARD PAC-CLAD FINISH
- C. Finish shall be Kynar 500 or Hylar 5000 Fluorocarbon coating with a top side film thickness of 0.70 to 0.90 mil over a 0.25 to 0.3 mil prime coat to provide a total dry film thickness of 0.95 to 1.25 mil, to meet AAMA 621. Bottom side shall be coated with a primer with a dry film thickness of 0.25 mil. Finish shall conform to all tests for adhesions, flexibility and longevity as specified by Kynar 500 or Hylar 5000 finish supplier.
- D. If Strippable coating to be applied on the pre-finished panels to the top side to protect the finish during fabrication, shipping and handling, film shall be removed before installation.
- E. Trim: Trim shall be fabricated of the same material and finish to match the profile, and will be press broken in lengths of 10 to 12 feet. Trim shall be formed only by the manufacturer of their approved dealer. Trim to be erected in overlapped condition. Use lap strips only as indicated on drawings. Miter conditions shall be factory welded material to match the sheeting.
- F. Accessories/Fasteners: Fasteners shall be of type, material, size, corrosion resistance, holding power and other properties required to fasten miscellaneous framing members to substrates. Accessories and their fasteners shall be capable of resisting the specified design wind uplift forces and shall allow for thermal movement of the wall panel system. Exposed fasteners shall not restrict free movement of the roof panel system resulting from thermal forces, except at designed points of roof panel fixity
- G. Substrate shall be Plywood
- H. Underlayment
 - 1. On all surfaces to be covered with metal wall panels, furnish and install a 40 mil "Peel & Stick membrane", required as outlined by metal panel manufacturer. Membrane to be a minimum of 40 mil thickness, smooth, non-granular, by one of the following manufacturers:
 - a. W.R Grace "Ice & Water Shield"
 - b. Cetco Strongseal
 - c. Carlisle CCW WIP 300HT
 - d. Interwrap Titanium PSU
 - e. MFM Corp "Wind & Water Shield"
 - f. Polyguard Deck Guard HT of Polyglas HT
 - g. Tamko TW Tile and Metal Underlayment
- I. Fluid Applied Weather Barrier to be applied on masonry surface behind panels:
 - 1. Use of air and water barrier is required with wall panel system.
 - 2. Product: Barriseal water-based, polymer-modified asphalt as manufactured by Carlisle Coatings and Waterproofing; www.carlisle-ccw.com or approved equal.
 - 3. Either spray or roller grade as selected by installing contractor.
 - 4. Installing contractor shall be licensed and certified to install Fluid-Applied Membrane Air Barriers by the Air Barrier Association of America (ABAA).
 - 5. Provide all accessories recommended by manufacturer for installation conditions
- J. Sealants
 - 1. Provide two-part polysulfide class B non-sag type for vertical and horizontal joints or
 - 2. One part polysulfide not containing pitch or phenolic extenders or
 - 3. Exterior grade silicone sealant recommended by roofing manufacturer or
 - 4. One part non-sag, gun grade exterior type polyurethane recommended by the roofing manufacturer.

SECTION 07410

PREFORMED METAL WALL PANELS

2.4 FABRICATION

- A. Comply with dimensions, profile limitations, gauges and fabrication details shown and if not shown, provide manufacturer's standard product fabrication.
 - 1. Max panel length is 25'.
- B. Fabricate components of the system in factory, ready for field assembly.
- C. Fabricate components and assemble units to comply with fire performance requirements specified.
- D. Apply specified finishes in conformance with manufacturer's standard, and according to manufacturer's instructions.

PART 3 – EXECUTION

3.1 INSPECTION

- A. Examine alignment of structural steel and related supports, primary and secondary roof framing, solid roof sheathing, prior to installation.
- B. For the record, prepare written report, endorsed by installer, listing conditions detrimental to performance of the Work.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 FASTENERS

- A. Secure units to supports
- B. Place fasteners as indicated in manufacturer's standards.

3.3 INSTALLATION

- A. Compliance: Comply with manufacturer's product data, recommendations and installation instructions for substrate verification, preparation requirements and installation.
- B. Panels shall be installed plumb and true in a proper alignment and in relation to the structural framing. The erector must have at least five years successful experience with similar applications.
- C. Install metal panels, fasteners, trim and related sealants in accordance with approved shop drawings and as may be required for a weather-tight installation.
- D. Provide uniform, neat seams.
- E. Fasteners: Conceal fasteners where possible in exposed work. Cover and seal fasteners and anchors for watertight and leakproof installation.
- F. Remove all strippable coating and provide a dry-wipe down cleaning of the panels as they are erected.

3.4 DAMAGED MATERIAL

- A. Upon determination of responsibility, repair or replace damaged metal panels and trim to the satisfaction of the Architect and Owner.

3.5 CLEANING

- A. Cleaning: Remove temporary coverings and protection of adjacent work areas. Repair or replace damage installed products. Clean installed products in accordance with manufacturer's instruction prior to owner's acceptance. Remove construction debris from project site and legally dispose of debris.

END OF SECTION

SECTION 07421

ALUMINUM COMPOSITE BUILDING PANELS

PART 1 – GENERAL

1.1 SECTION INCLUDES

- A. Panel system requirements include the following components:
 - a. Aluminum-faced composite panels with mounting system. Panel mounting system including anchorages, furring, fasteners, gaskets and sealants, related flashing adapters and masking for a complete installation.
 - b. Panel manufacturer recommends that system should include shop-installed aluminum stiffeners on all panels of 20 square feet or larger. Minimum stiffener recommendation is one per 20 square feet of panel area.
 - c. System to be fabricated and installed per local code requirements.

1.2 RELATED SECTIONS

- A. Section 07620: Sheet Metal Flashing and Trim
- B. Section 07900: Joint Sealers

1.3 PERFORMANCE REQUIREMENTS

- A. Structural performance: provide exterior/interior wall cladding assemblies capable of withstanding the effects of load and stresses from dead loads, wind loads, snow loads and normal thermal movement without evidence of permanent defects of assemblies or components.
 - 1. Dead load: As required by applicable building code.
 - 2. Live Load: As required by applicable building code.
 - 3. Wind Load: Uniform pressure [velocity pressure] of [Insert Design Criteria] lb/sq ft. [Insert Design Criteria], acting inward or outward.
 - 4. Thermal Movements: Provide assemblies that allow for thermal movements resulting from the following maximum changes (range) in ambient and surface temperatures by preventing buckling, opening of joints, overstressing of components and other detrimental effects:
 - a. Temperature Change (range): 120 deg F (67 deg C), ambient; 180 deg F (100 deg C), material surfaces.
- B. Sealed joints shall allow free and silent movement of panels during expansion and contraction while preventing uncontrolled penetration of moisture.
- C. Manufacturing, installation, and sealing shall prevent deformation of exposed surfaces.
- D. Design panel system to accommodate substructure tolerance of +0 to -1/8 inch.
- E. Design the system to affect a positive mechanically fastened assembly to substructure, not dependent on adhesives.
- F. Not Permitted: Vibration harmonics; wind whistles; noises caused by thermal movement; thermal movement transmitted to other building elements; loosening, weakening or fracturing of attachments or components of system.
- G. Structural Performance / Uniform Load Deflection Test: Provide panel system that has been tested in accordance with ASTM E330 at a design pressure of 60 psf without deformation or failures of structural members. Maximum allowable deflection of span: L/60.
- H. Air Infiltration: Panel system shall not have air infiltration rate more than 0.06 cfm per sq. ft. of fixed wall area when tested in accordance with ASTM E283 at static air pressure differential of 1.57 psf.
- I. Static Water Penetration: Panel system shall have no water penetration as defined by in test method when tested in accordance with ASTM E331 at inward static pressure differential of not less than 6.24 psf and not more than 12.0 psf.
- J. Dynamic Water Penetration: Panel system shall have been tested in accordance with AAMA 501 and shall have passed with no uncontrolled water leakage at 10.00 psf dynamic pressure differential, with water application rate of 5 gallons/hr/sqft.

SECTION 07421

ALUMINUM COMPOSITE BUILDING PANELS

1.4 QUALITY ASSURANCE

- A. Composite panel manufacturer shall have a minimum of 5 years' architectural experience in the manufacture of this product and be located within the continental USA.
- B. It is recommended that fabrication and installation of composite panels shall be from a single source. If not single source, both panel fabricator and the installer must show proof of past successful collaboration.
- C. Installer shall be acceptable to composite panel manufacturer.
- D. Installer shall have a minimum 5 years' experience in architectural metal panel work similar in scope and size to this project.
- E. Shop drawings shall show the preferred joint details providing a watertight and structurally sound wall panel system that allows no uncontrolled water penetration, on the inside face of the panel system as determined by ASTM E331.
- F. Maximum deviation from vertical and horizontal alignment of erected panels: 6 mm (1/4") in 6 m (20') non-accumulative.
- G. Panel fabricator and installer shall assume undivided responsibility for all components of the exterior panel system, including but not limited to, attachment to sub-construction, panel-to-panel joinery, panel-to-dissimilar-material joinery and joint seal associated with the panel system.

1.5 REFERENCES

- A. American Society for Testing and Materials
 - 1. E330: Structural Performance of Exterior Windows, Curtain Walls and Doors under the Influence of Wind Loads.
 - 2. E283: Rate of Leakage Through Exterior Windows, Curtain Walls and Doors.
 - 3. D1781: Climbing Drum Peel Test for Adhesive Materials.
 - 4. E84: Surface-Burning Characteristics of Building Materials.
 - 5. E283: Air Performance of Exterior Windows, Curtain Walls and Doors.
 - 6. D3363: Method for Film Hardness by Pencil Test.
 - 7. D2794: Resistance of Organic Coatings to the Effects of Rapid Deformation (Impact).
 - 8. D3359: Methods for Measuring Adhesion by Tape Test.
 - 9. D2247: Practice for Testing Water Resistance of Coatings in 100% Relative Humidity.
 - 10. B117: Method of Salt Spray (Fog) Testing.
 - 11. D822: Practice for Operating Light and Water Exposure Apparatus (Carbon-Arc Type) for Testing Paint, Varnish, Lacquer and Related Products.
 - 12. D1308: Effect of Household Chemicals on Clear and Pigmented Organic Finishes.
 - 13. D1735: Method for Water Fog Testing of Organic Coatings.
 - 14. D1929: Standard Test Method for Determining Ignition Temperature of Plastics.
 - 15. D635: Standard Test Method for Rate of Burning and/or Extent and Time of Burning of Plastics in Horizontal Position.
- B. American Architectural Manufacturers Association
 - 1. AAMA-620

1.6 SUBMITTALS

- A. Submittals shall be in conformance with section 01300 – Administrative Requirements.
- B. Samples
 - 1. Panel assembly: Two samples of each type of assembly, 12" x 12" minimum.
 - 2. Two samples of each color or finish selected, 3" x 4" minimum.
- C. Shop Drawings: Submit shop drawings showing project layout and elevations; fastening and anchoring methods; detail and location of joints, sealants and gaskets, including joints necessary to accommodate thermal movement; trim; flashing; and accessories.
- D. Manufacturer's literature shall certify that material meets specifications.
- E. Submit fabrication drawings showing location and type of aluminum-extruded stiffeners at typical panels and at corner panels, if required.

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ALUMINUM COMPOSITE BUILDING PANELS

1.7 DELIVERY, STORAGE & HANDLING

- A. Deliver materials in manufacturer's original, unopened, undamaged containers with identification labels intact.
 - 1. Store materials in accordance with manufacturer's recommendations.
 - 2. Handle materials carefully to avoid damage to materials and finishes.

1.8 PROJECT CONDITIONS

- A. Field Measurements: Verify actual supporting and adjoining construction by field measurements before fabrication, and indicate recorded measurements on final shop drawings. Coordinate construction to ensure that wall panel assemblies fit properly to supporting and adjoining construction and coordinate schedule with construction progress to avoid delaying the work.
 - 1. Established dimensions: where field measurements can not be made without delaying the work, guarantee dimensions and proceed with fabrication of wall panel assemblies corresponding to the established dimensions.

1.9 WARRANTY

- A. The installer will warrant the wall system for a period of 1 year past substantial completion that the fabrication and installation workmanship will be free from defects.
- B. The aluminum composite material manufacturer shall warrant for a period of 20 years against Max 5 fade based on ASTM D2244 and Max 8 chalk based on ASTM D4212 and delamination of the paint finish.

PART 2 – PRODUCTS

2.1 MANUFACTURER

- A. Basis of Design: Petersen Aluminum Corporation, 1005 Tonne Road, Elk Grove Village, IL 60007. Phone – 800-722-7440, Fax: 800-722-7150, www.pac-clad.com
 - 1. (MP-1) PAC 3000 CS Caulk Joint Composite Wall Panel System
- B. Products indicated are provided by specified manufacturer. Other approved manufacturers shall provide products equal in thickness, panel weight, bond integrity, fire rating, paint color and finish. to those specified and shall meet or exceed all minimum specifications listed. Substitutions: See Section 01600 - Product Requirements.

2.2 MATERIALS

- A. Composite Panels
 - 1. Panels shall be Reynobond® Aluminum Composite Material (ACM) as manufactured by Alcoa Architectural Products,
 - 2. Standard Polyethylene Core (PE)
 - 3. Panel Thickness: RB160 = 0.157"
 - 4. Panel Weight: RB160 = 1.12 lbs/sft
- B. Product Performance
 - 1. Bond integrity: When tested for bond integrity, in accordance with ASTM D1781 (simulating resistance to panel delamination), there shall not be an adhesive failure of the bond
 - a. Between the core and the skin or
 - b. Cohesive failure of the core itself below the following values.
 - 2. Peel Strength: 178 N mm/mm (40 in lb./in.) as manufactured; 178 N mm/mm (40 in lb./in.) After 21 days soaking in water at 70°F
 - 3. Fire Performance: ASTM E84 – Passed Class A
- C. Panel Finishes
 - 1. Coil-coated Kynar 500® or Hylar 5000® based polyvinylidene fluoride (PVDF). Alcoa Architectural Products shall be Colorweld® 300 a fluoropolymer coating utilizing 70% Kynar 500® resins.
 - a. Color:
 - 1) Type 1: Bone White Type 1: Bone White

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ALUMINUM COMPOSITE BUILDING PANELS

- 2) Type 2: Color: To be selected from Manufacturer's full line of colors.
- D. Coating: Shall be factory applied on a continuous-process paint line. Coating shall consist of a 0.2 mil (approx.) prime coat and a 0.8 mil (approx.) finish coat containing 70% Kynar 500® resins. (If Colorweld® 300XL, coating shall consist of a 0.2 mil (approx.) barrier prime coat, a 0.80 mil (approx.) color coat, containing 70% Kynar 500® resins and a 0.5 mil (approx.) clear coat containing 70% Kynar 500® resins.) Nominal dry film thickness is 1.50 mils.
- a. Gloss: ASTM D523 standard at 60° shall be 25–30.
 - b. Pencil hardness: ASTM D3363 shall be HB-H minimum (eagle turquoise).
 - c. Flexibility T-Bend: ASTM D4145 shall be 1 T-Bend; no pick-off.
 - d. Adhesion: ASTM D3359 reverse impact 1/16" crosshatch shall show no cracking or adhesion loss.
 - e. Reverse Impact: ASTM D2794 1500 x metal thickness aluminum shall show no cracking or adhesion loss.
 - f. Acid Resistance: ASTM D1308, 10% muriatic acid, 24 hrs., shall show no effect. 20% sulfuric acid, 18 hrs, shall show no effect.
 - g. Acid Rain Test: Kesternich SO₂, DIN 500180, 10 cycles min. No objectionable color change.
 - h. Alkali Resistance: ASTM D1308, 10%, 25% NaOH, 1 hr., shall show no effect.
 - i. Salt Spray Resistance: ASTM B117, 5% salt fog at 95°F. Pass 4,000 hrs. less than 1/16" average creep from scribe; up to a few #8 blisters.
 - j. Humidity Resistance: ASTM D714 & ASTM D2247 100% relative humidity at 95°F, shall pass 4,000 hrs., # 8 blisters.
 - k. Exterior Exposure: 10 years at 45°, South Florida. ASTM D2244 shall be Max. 5 fade and ASTM D4214 shall be Max. 8 chalk.
 - l. Paint system shall meet the requirements of AAMA 620 specifications. Megaflon®, Coraflon® or any Lumiflon®-based paint systems are not acceptable.
 - m. Paint system shall have more than 20 years of architectural field use.

2.3 PANEL FABRICATION

- A. ACM is comprised of two sheets of aluminum sandwiching a solid core of extruded thermoplastic material formed in a continuous process using no glues or adhesives between dissimilar materials. The core shall be free of voids and/or air spaces and not contain foamed insulation materials. The bond between the core and the skins shall be a chemical bond. Products laminated sheet by sheet in a batch process using glues or adhesives between materials shall not be acceptable.
- B. Aluminum Face Sheets
1. Thickness: 0.020"
 2. Aluminum alloy shall be 3000 series or equivalent.
- C. Tolerances
1. Panel Bow: Shall not exceed 0.8% of panel overall dimension in width or length.
 2. Panel Dimensions: Field fabrication shall be allowed where necessary, but shall be kept to an absolute minimum. All fabrication shall be done under controlled shop conditions when possible. Panel dimensions shall be such that there will be an allowance for field adjustment and thermal movement.
 3. Panel Lines: Breaks and curves shall be sharp and true, and surfaces free of warps or buckles.
 4. Flatness: Panels shall be visually flat.
 5. Panel Surfaces: Shall be free of scratches or marks caused during fabrication.
- D. System Characteristics
1. Plans, elevations, details, characteristics and other requirements indicated are based upon standards by one manufacturer.
 2. System must not generally have any visible fasteners, telegraphing or fastening on the panel faces or any other compromise of a neat and flat appearance.
 3. Fabricate panel system to dimension, size and profile indicated on the drawings based on a design temperature of 68°F.

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4. Fabricate panel system to avoid compressive skin stresses. The installation detailing shall be such that the panels remain flat regardless of temperature changes and at all times remain air- and watertight.
 5. The finish side of the panel shall have a removable protective film applied prior to fabrication, which shall remain on the panel during fabrication, shipping and erection to protect the surface from damage.
- E. System Type (select from the following)
1. PAC 3000CS - Rout-and-Return Wet System, engineered system including clips, trim, and flashings.
- F. System Performance
1. Composite panels shall be capable of withstanding building movements and weather exposures based on the following test standards required by the architect and/or local building codes:
 - a. Wind Load – If system tests are not available, under the direction of an independent third-party laboratory, mockups shall be constructed and tests performed to show compliance to the following minimum standards:
 - 1) Panels shall be designed to withstand the design wind load based upon the local building code, but in no case less than 20 pounds per square foot (psf) and 30 psf on parapet and corner panels. Wind-load testing shall be conducted in accordance with ASTM E330 to obtain the following results.
 - 2) Normal to the plane of the wall between supports, deflection of the secured perimeter-framing members shall not exceed $L/175$ or $3/4"$, whichever is less.
 - 3) Normal to the plane of the wall, the maximum panel deflection shall not exceed $L/60$ of the full span.
 - 4) Maximum anchor deflection shall not exceed $1/16"$. At $1\ 1/2$ times design pressure, permanent deflections of framing members shall not exceed $l/100$ of span length and components shall not experience failure or gross permanent distortion. At connection points of framing members to anchors, permanent set shall not exceed $1/16"$.
 - b. Air/Water System Test – Without backup waterproof membrane. If system tests are not available, under the direction of an independent third-party laboratory, mockups shall be constructed and tests performed to show compliance to the following minimum standards:
 - 1) Air Infiltration – When tested in accordance with ASTM E283, air infiltration at 1.57 psf must not exceed 0.06 cubic feet per minute per square foot of wall area.
 - 2) Water Infiltration – Water infiltration is defined as uncontrolled water leakage through the exterior face of the assembly. Systems not using a construction sealant at the panel joints (i.e., Dry Systems) shall be designed to drain any water leakage occurring at the joints. No water infiltration shall occur in any system under a differential static pressure of 6.24 psf after 15 minutes of exposure in accordance with ASTM E331.

2.4 ACCESSORIES

- A. Extrusions, formed members, sheet and plate shall conform with ASTM B209 and the recommendations of the manufacturer.
- B. Panel stiffeners, if required, shall be structurally fastened or restrained at the ends and shall be secured to the rear face of the composite panel with silicone of sufficient size and strength to maintain panel flatness. Stiffener material and/or finish shall be compatible with the silicone.
- C. Sealants and gaskets within the panel system shall be as per manufacturer's standards to meet performance requirements.
- D. Fabricate flashing materials from 0.040" minimum thickness aluminum sheet or as recommended by panel manufacturer to match the adjacent curtain wall/panel system where exposed. Post-painted spray-applied flashings are not acceptable. Provide a lap strap under the flashing at abutted conditions and seal lapped surfaces with a full bead of non-hardening sealant.
- E. Fasteners (concealed/non-corrosive): Fasteners as recommended by system manufacturer.

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ALUMINUM COMPOSITE BUILDING PANELS

PART 3 – EXECUTION

3.1 INSPECTION

- A. Surfaces to receive panels shall be even, smooth, sound, clean, dry and free from defects detrimental to work. Notify contractor in writing of conditions detrimental to proper and timely completion of the work. Do not proceed with erection until unsatisfactory conditions have been corrected.
- B. Surfaces to receive panels shall be structurally sound as determined by a registered engineer. In no case shall metal structural supports be less than 18 gauge.

3.2 INSTALLATION

- A. Erect panels plumb and level.
- B. Attachment system shall allow for the free vertical and horizontal thermal movement due to expansion and contraction for a material temperature range of -20°F to +180°F. Buckling of panels, opening of joints, undue stress on fasteners, failure of sealants or any other detrimental effects due to thermal movement are not permitted. Fabrication, assembly and erection procedure shall account for the ambient temperature at the time of the respective operation.
- C. Panels shall be erected in accordance with an approved set of shop drawings.
- D. Anchor panels securely per engineering recommendations and in accordance with approved shop drawings to allow for necessary thermal movement and structural support.
- E. Conform to panel fabricator's instructions for installation of concealed fasteners.
- F. Do not install component parts that are observed to be defective, including warped, bowed, dented, scraped and broken members.
- G. Do not cut, trim, weld or scrape component parts during erection in a manner that would damage the finish, decrease strength or result in a visual imperfection or a failure in performance. Return component parts that require alteration to shop for re-fabrication, or for replacement with new parts.
- H. Separate dissimilar metals; use appropriate gaskets and fasteners to minimize corrosive or electrolytic action between metals.

3.3 ADJUSTING AND CLEANING

- A. Remove and replace panels damaged beyond repair as a direct result of panel installation. After installation, panel repair and replacement shall become the responsibility of the general contractor.
- B. Repair panels with minor damage.
- C. Remove masking film (if used) as soon as possible after installation. Masking intentionally left in place after panel installation on an elevation shall become the responsibility of the general contractor.
- D. Any additional protection, after installation, shall be the responsibility of the general contractor to remove.
- E. Make sure weep holes and drainage channels are unobstructed and free of dirt and sealants.
- F. Final cleaning shall not be part of the work of this section.

END OF SECTION

SECTION 07424

COMPOSITE WALL PANELS

PART 1 – GENERAL

1.1 SECTION INCLUDES

- A. Exterior, panelized fiber cement cladding system and accessories to complete a drained and back-ventilated rainscreen.
- B. Interior fiber cement panelized cladding system and accessories.

1.2 RELATED SECTIONS

- A. Section 05410 – Cold Form Metal Framing
- B. Section 06100 - Rough Carpentry
- C. Section 07212 – Board and Batt Insulation
- D. Section 07272 - Weather Barriers
- E. Section 07620 – Sheet Metal Flashing and Trim
- F. Section 07900 - Joint Sealers

1.3 REFERENCES

- A. American Architectural Manufacturers Association (AAMA):
 - 1. AAMA 509-14 – Voluntary Test and Classification Method of Drained and Back Ventilated Rain Screen Wall Cladding Systems
- B. ASTM International (ASTM):
 - 1. ASTM C 518 - Standard Test Method for Steady-State Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus.
 - 2. ASTM C 1185 - Standard Test Methods for Sampling and Testing Non-Asbestos Fiber Cement.
 - a. ASTM C 1186 – Standard Specification for Flat Fiber-Cement Sheets.
 - 3. ASTM E-84 - Standard Test for Surface Burning Characteristics of Building Materials.
 - 4. ASTM E 119 - Standard Test Methods for Fire Tests of Building Construction and Materials.
 - 5. ASTM E 228 - Standard Test Method for Linear Thermal Expansion of Solid Materials with a Vitreous Silica Dilatometer.
 - 6. ASTM E 330 - Standard Test Method for Structural Performance of Exterior Windows, Curtain Walls, and Doors by Uniform Static Air Pressure Difference.
 - 7. ASTM E 331 - Standard Test Method for Water Penetration of Exterior Windows, Curtain Walls, and Doors by Uniform Static Air Pressure Difference.
- C. Florida Building Code - Test Protocol HVHZ
 - 1. Testing Application Standard (TAS) 202, 203 – HVHZ Test Procedures
- D. National Fire Protection Association (NFPA):
 - 1. NFPA 285 - Fire Test Method for Exterior Wall Assemblies Containing Combustible Material.
 - 2. NFPA 268 – Ignition Resistance of Exterior Wall Assemblies.
- E. Standards Council of Canada & Underwriters Laboratories Canada (ULC):
 - 1. CAN/ULC S-102 – Standard Method of Test for Surface Burning Characteristics.
 - 2. CAN/ULC S-134 – Standard Method of Fire Test of Exterior Wall Assembly.

1.4 SUBMITTALS

- A. Submit under provisions of Section 01 33 00.
- B. Product Data: Submit manufacturer's product description, storage and handling requirements, and installation instructions.
- C. Product Test Reports and Code Compliance: Documents demonstrating product compliance with local building code, such as test reports or Evaluation Reports from qualified, independent testing agencies.
- D. Manufacturer's Details: Submit drawings (.dwg.pdf formats), including plans, sections, showing installation details that demonstrate product dimensions, edge/termination conditions/treatments, compression and control joints, corners, openings, and penetrations.
- E. Samples: Submit samples of each product type proposed for use.

SECTION 07424

COMPOSITE WALL PANELS

1.5 QUALITY ASSURANCE

- A. Manufacturer Qualifications:
 - 1. All fiber cement panels specified in this section must be supplied by a manufacturer with a minimum of 10 years of experience in fabricating and supplying fiber cement cladding systems.
 - a. Products covered under this section are to be manufactured in an ISO 9001 certified facility.
 - 2. Provide technical and design support as needed regarding installation requirements and warranty compliance provisions.
- B. Installer Qualifications: All products listed in this section are to be installed by a single installer trained by manufacturer or representative.
- C. Mock-Up Wall: Provide a mock-up wall as evaluation tool for product and installation workmanship.
- D. Pre-Installation Meetings: Prior to beginning installation, conduct conference to verify and discuss substrate conditions, manufacturer's installation instructions and warranty requirements, and project requirements.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Panels must be stored flat and kept dry before installation. A waterproof cover over panels and accessories should be used at all times prior to installation. Do not stack pallets more than two high. Refer to the information included on each pallet.
- B. If panels are exposed to water or water vapor prior to installation, allow to completely dry before installing. Failure to do so may result in panel shrinkage at ship lap joints, and such action may void warranty.
- C. Panels MUST be carried on edge. Do not carry or lift panels flat. Improper handling may cause cracking or panel damage.
- D. Direct contact between the panels and the ground should be avoided at all times. It is necessary to keep panels clean during installation process.

1.7 WARRANTY

- A. Provide manufacturer's 15-year warranty against manufactured defects in fiber cement panels. Additional 5-year extension available when refinished in year 14-15.
- B. Provide manufacturer's 15-year warranty against manufactured defects in panel finish.
- C. Warranty provides for the original purchaser. See warranty for detailed information on terms, conditions and limitations.

PART 2 – PRODUCTS (FCCP-1)

2.1 MANUFACTURERS

- A. Acceptable Manufacturers:
 - 1. Nichiha USA, Inc., 3150 Avondale Mill Rd, Macon, GA 301216, USA
 - 2. Basis of Design Product: Nichiha VintageWood.
 - a. Profile colors: Spruce.
 - b. Profiles: Wood plank texture with three, 3/8" grooves running lengthwise, spaced 5-5/8" apart.
 - c. Accessory/Component Options:
 - 1) Manufactured Corners with 3-1/2" returns for each profile color.
 - 2) Aluminum trim options: Corner Key, Open Outside Corner, H-Mold, J-Mold, Compression Joint, Inside Corner
 - a) Finish: All trim to match color of panels. Trim is required at bottom of panel at Exit E1.
 - 3) Essential Flashing System: Starter, Overhang.
 - a) Finish: Color to match panels.

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- d. Dimensions:
 - 1) AWP-1818: 455mm (17-7/8") (h) x 1,818 mm (71-9/16")
 - e. Panel Thickness: 16 mm (5/8").
 - f. Weight: AWP-3030: 57.32 lbs. per panel.
 - g. Coverage: 8.88 sq. ft. per panel (1818), 14.81 sq. ft. per panel (3030).
 - h. Factory sealed on six 6 sides.
- B. Requests for substitutions will be considered in accordance with provisions of Section 01600.

2.2 MATERIALS

- A. Fiber cement panels manufactured from a pressed, stamped, and autoclaved mix of Portland cement, fly ash, silica, recycled rejects, and wood fiber bundles.
- B. Panel surface pre-finished and machine applied.
- C. Panels profiled along 3030mm edges so that the long joints between the installed panels are ship-lapped.
- D. Factory-applied sealant gasket added to top panel edge; all 3030mm edge joints contain a factory sealant.

2.3 PERFORMANCE REQUIREMENTS:

- A. Fiber Cement Cladding – Must comply with ASTM C-1186, Type A, Grade II requirements:
 - 1. Wet Flexural Strength: Result: 1418 psi, Lower Limit: 1015 psi.
 - 2. Water Tightness: No water droplets observed on any specimen.
 - 3. Freeze-thaw: No damage or defects observed.
 - 4. Warm Water: No evidence of cracking, delamination, swelling, or other defects observed.
 - 5. Heat-Rain: No crazing, cracking, or other deleterious effects, surface or joint changes observed in any specimen.
- B. Mean Coefficient of Linear Thermal Expansion (ASTM E-228): Max 1.0×10^{-5} in./in. F.
- C. Surface Burning (CAN-ULC S102/ASTM E-84): Flame Spread: 0, Smoke Developed: 0.
- D. Wind Load (ASTM E-330): Contact manufacturer for ultimate test pressure data corresponding to framing type, dimensions, fastener type, and attachment clips. Project engineer(s) must determine Zone 4 and 5 design pressures based on project specifics.
 - 1. Minimum lateral deflection: L/120.
- E. Water Penetration (ASTM E-331): No water leakage observed into wall cavity.
- F. Steady-State Heat Flux and Thermal Transmission Properties Test (ASTM C-518): 16mm thick panel thermal resistance R Value of 0.47.
- G. Fire Resistant (ASTM E-119): The wall assembly must successfully endure 60-minute fire exposure without developing excessive unexposed surface temperature or allowing flaming on the unexposed side of the assembly.
- H. Ignition Resistance (NFPA 268): No sustained flaming of panels, assembly when subjected to a minimum radiant heat flux of 12.5 kW/m² ± 5% in the presence of a pilot ignition source for a 20-minute period.
- I. Fire Propagation (NFPA 285): Wall assembly of Nichiha AWP, Ultimate Clips and Starter Track, Tyvek Commercial Wrap, 1/2" Densglass Gold Sheathing, 16" o.c. 18 gauge steel studs, mineral wool in-cavity insulation, and interior 5/8" Type X gypsum met the acceptance criteria of NFPA 285.
- J. Fire Propagation (CAN/ULC S-134): Wall assembly of Nichiha AWP, Ultimate Clips and Starter Track, Tyvek Housewrap, 5/8" FRT plywood, 16" o.c. 2x wood studs, fiberglass in-cavity insulation, and interior 5/8" Type X gypsum met the acceptance criteria of CAN/ULC S-134.
- K. Drained and Back Ventilated Rainscreen (AAMA 509-14): System classifications: W1, V1.
- L. Florida Building Code - Test Protocol HVHZ (TAS 202, 203): Horizontal Application Design Pressure: 95 psf, Vertical Application Design Pressure: 85 psf.

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2.4 INSTALLATION COMPONENTS

- A. Ultimate Clip System:
 - 1. Starter Track:
 - a. Horizontal Panel Installations - FA 700 – 3,030mm (l) galvalume coated steel.
 - b. Vertical Panel Installations (AWP-3030 only) – FA 710T – 3,030mm (l) galvalume coated steel.
 - 2. Panel Clips: JEL 778 “Ultimate Clip II” (10mm rainscreen for 16mm AWP) – Zinc-Aluminum-Magnesium alloy coated steel.
 - a. Joint Tab Attachments (included) – used at all AWP-1818 panel to panel vertical joints, NOT used with AWP-3030 installations.
 - 3. Corner Clips: JE 777C (10mm rainscreen for 5/8” AWP Manufactured Corners) -- Zinc-Aluminum-Magnesium alloy coated steel.
 - 4. Single Flange Sealant Backer – FHK 1015 R (10mm) – 6.5’ (l) fluorine coated galvalume.
 - 5. Double Flange Sealant Backer – FH 1015 R (10mm) – 10’ (l) fluorine coated galvalume.
 - 6. Corrugated Spacer – FS 1005 (5mm), FS 1010 (10mm) – 4’ (l).
- B. Aluminum Trim: Paint primed trim as specified in finish schedule.
- C. Essential Flashing System:
 - 1. Starter – main segments (3,030mm), inside corners, outside corners
 - 2. Overhang – main segments (3,030mm), inside corners, outside corners, joint clips
- D. Fasteners: Corrosion resistant fasteners, such as hot-dipped galvanized screws appropriate to local building codes and practices must be used. Use Stainless Steel fasteners in high humidity and high-moisture regions. Panel manufacturer is not liable for corrosion resistance of fasteners. Do not use aluminum fasteners, staples or fasteners that are not rated or designed for intended use. See manufacturer’s instructions for appropriate fasteners for construction method used.
- E. Flashing: Flash all areas specified in manufacturer’s instructions. Do not use raw aluminum flashing. Flashing must be galvanized, anodized, or PVC coated.
- F. Sealant: Sealant shall comply with ASTM C920, Class 35.

PART 3 – EXECUTION

3.1 EXAMINATION

- A. Verification of Conditions:
 - 1. Fiber cement panels can be installed over braced wood, steel studs and sheathing including plywood, OSB, plastic foam (1” or less) or fiberboard sheathing. Fiber cement panels can also be installed over Structural Insulated Panels (SIP’s), Concrete Masonry Units (CMU’s) and Concrete Block Structures (CBS’s) with furring strips, and Pre-Engineered Metal Construction. Insulated Concrete Forms (ICFs) require added measures. Consult with Nichiha Technical Services.
 - 2. Allowable stud spacing: 16” o.c. maximum.
 - 3. A weather resistive barrier is required when installing fiber cement panels. Use an approved weather resistive barrier (WRB) as defined by the 2015 IBC or IRC. Refer to local building codes.
 - 4. Appropriate metal flashing should be used to prevent moisture penetration around all doors, windows, wall bottoms, material transitions and penetrations. Refer to local building codes for best practices.
- B. Examine site to ensure substrate conditions are within alignment tolerances for proper installation.
- C. Do not begin installation until unacceptable conditions have been corrected.
- D. Do not install panels or components that appear to be damaged or defective. Do not install wet panels.

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3.2 TOLERANCE

- A. Wall surface plane must be plumb and level within +/- ¼ inch in 20 feet in any direction.
1. One layer of Nichiha 5mm (~3/16") Spacer may be used as shim.

3.3 INSTALLATION

- A. General: Install products in accordance with the latest installation guidelines of the manufacturer and all applicable building codes and other laws, rules, regulations and ordinances. Review all manufacturer installation, maintenance instructions, and other applicable documents before installation.
1. Consult with your local dealer or Nichiha Technical Department before installing any Nichiha fiber cement product on a building higher than 45 feet or three stories or for conditions not matching prescribed standard installation guide requirements and methods. A Technical Design Review (TDR) process is available to evaluate project feasibility.
 2. Vertical Control/Expansion Joints are required with AWP-1818, for walls wider than 30 feet, within 2-12 feet of outside corners finished with metal trim and approximately every 30 feet thereafter.
 - a. Vertical Control/Expansion Joints are required at each AWP-3030 vertical joint, or H-Mold trim may be used instead.
 3. Horizontal/Compression Joints are required for multi-story installations of AWP. Locate joints at floor lines. Joints are flashed minimum ½" breaks. Do not caulk. Refer to installation guide(s).
 - a. Wood framed buildings of three or more floors require a compression joint at each floor.
 - b. Steel framed buildings (including reinforced concrete core with LGMF exterior walls) of more than three floors (or 45 feet) require a compression joint every 25 feet at a floor line.
- B. Panel Cutting
1. Always cut fiber cement panels outside or in a well ventilated area. Do not cut the products in an enclosed area.
 2. Always wear safety glasses and NIOSH/OSHA approved respirator whenever cutting, drilling, sawing, sanding or abrading the products. Refer to manufacturer SDS for more information.
 3. Use a dust-reducing circular saw with a diamond-tipped or carbide-tipped blade.
 - a. Recommended circular saw: Makita 7-1/4" Circular Saw with Dust Collector (#5057KB).
 - b. Recommended blade: Tenryu Board-Pro Plus PCD Blade (#BP-18505).
 - c. Shears (electric or pneumatic) or jig saw can be used for complicated cuttings, such as service openings, curves, radii and scrollwork.
 4. Silica Dust Warning: Fiber cement products may contain some amounts of crystalline silica, a naturally occurring, potentially hazardous mineral when airborne in dust form. Consult product SDS or visit <https://www.osha.gov/dsg/topics/silicacrystalline/>.
 5. Immediately clean dust from cut panels as it may bind to the finish.

3.4 CLEANING AND MAINTENANCE

- A. Review manufacturer guidelines for detailed care instructions.

END OF SECTION

SECTION 07531

SINGLE PLY ROOFING-FULLY ADHERED EPDM

PART 1 – GENERAL

1.1 SECTION INCLUDES

- A. Substrate covering over metal deck and vapor retarder.
- B. Vapor retarder and Sheathing over metal deck surfaces.
- C. Insulation.
- D. EPDM Membrane roofing, base flashings, roof expansion joints, and all accessories and appurtenances for a complete system.

1.2 RELATED SECTIONS

- A. Section 06114 - Wood Blocking and Curbing
- B. Section 07620 - Sheet Metal Flashing and Trim
- C. Section 07900 – Joint Sealers

1.3 REFERENCES

- A. ASTM C79 - Gypsum Sheathing Board
- B. ASTM C 1177/C 1177M - Standard Specification for Glass Mat Gypsum Substrate for Use as Sheathing; 2001.
- C. ASTM C1289-01 - Class I Grade II - Standard Specification for Faced Rigid Cellular Polyisocyanurate Thermal Insulation Board
- D. E108 - Standard Test Methods for Fire Tests of Roof Coverings
- E. E119 - Standard Test Methods for Fire Tests of Building Construction and Materials
- F. FM 4470 (Factory Mutual Engineering Corporation) - Roof Assembly Classifications.

1.4 SYSTEM DESCRIPTION

- A. Elastomeric Sheet Membrane EPDM Roofing System: Fully adhered single ply membrane roofing and flashing with vapor retarder, insulation, and all accessories and appurtenances for a complete system. Membrane, flashings and sealants to all be color: Black.

1.5 SUBMITTALS

- A. Section 01300 - Administrative Requirements: Procedures for submittals.
- B. Submit written certification that the roofing contractor/subcontractor has been an approved applicator of selected roof system for 5 years or more.
- C. Submit written certification of license under the Illinois Roofing Industry Licensing Act.
- D. Submit written certification from the proposed SPM manufacturer that all appropriate warranty paper work has been submitted prior to starting the work.
- E. Submit written certification from insulation manufacturer that their insulation is compatible with the proposed SPM .
- F. Submit written certification and/or documentation that the foreman and/or crew members have attended the proposed SPM manufacturer's training seminar.
- G. Submit written certification from roofing system manufacturer that proposed insulation faces are compatible with proposed single ply membranes.
- H. Submit written certification from roofing system manufacturer that all details indicated in the drawings are acceptable to the roofing system manufacturer.
- I. Submit nail pull-out test results, roof test location plan and SPM manufacturer's letter of acceptance of pull-out results.
- J. Product Data: Provide characteristics on membrane materials, flashing materials, insulation, vapor retarders, and all products to be installed as part of roofing system.
 - 1. Material safety and technical information data sheets for all roofing system components.
 - 2. Insulation
 - a. Polyisocyanurate
 - 3. EPDM
 - a. membrane
 - b. Self adhering flashing
 - c. Adhesives

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- d. Seam Tape
- e. SPM sealant
- f. Water cut off mastic
- g. Color: Black.
- 4. Mechanical Fasteners:
 - a. Nails
 - b. Screw Fasteners
- 5. SPM manufacturer's specification and instruction manual for all components of roofing system.
- 6. Sample copy of manufacturer's 15 year full roof system and 20 year material warranty.
- 7. Vapor Retarder Materials
 - a. Asphalt primer
 - b. Asphalt
 - c. Base sheet
 - d. Top sheet
 - e. Roofing Cement
- 8. Cover Board.
- K. Shop Drawings:
 - 1. Submit shop drawings to the roofing system manufacturer for approval.
 - 2. Submit Manufacturer approved shop drawings to the Architect. Shop drawings shall represent standards and detailing as specified herein or as indicated in the drawings.
 - 3. Minimum scale: 3" = 1'-0", except where otherwise specified. Manufacturer's standard details are unacceptable.
 - 4. Submit:
 - a. Base flashing:
 - 1) Utilizing field ply EPDM as base flashing
 - 2) Utilizing reinforced EPDM strip
 - b. Parapet Roof edge with coping.
 - c. Mechanical/electrical equipment curbs.
 - d. Roof plumbing vents.
 - e. Roof drains showing appropriate extensions rings.
 - f. Pipe penetration curb.
 - g. Expansion joints.
 - h. Pipe Penetrations.
 - i. Roof plan/insulation layout:
 - 1) Tapered insulation layout minimum scale 1/8" = 1'-0".
 - 2) Indicate all roof curbs, penetrations, required saddles, and crickets.
 - 3) NO FLAT SUMPS AT DRAINS PERMITTED.
 - j. Roof plan with proposed lap seam layout.
- L. Samples: Submit 2 Manufacturer's samples.
 - 1. Insulation:
 - a. Polyisocyanurate 3 pieces
 - 2. 60 mil EPDM.
 - 3. Semi cured self adhering EPDM cover strip.
 - 4. Fasteners, as indicated on the drawings:
 - a. Nails
 - b. Screw fasteners w/stress plates
 - 5. 1/8 x 1 inch aluminum Termination bar
 - 6. Foam insulation adhesive
 - 7. Cover Board

1.6 SUBMITTALS FOR INFORMATION

- A. Section 01300 - Administrative Requirements: Procedures for submittals.
- B. Manufacturer's Installation Instructions: Indicate special precautions required for seaming the membrane.

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- C. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.
- D. Manufacturer's Field Reports: Submit under provisions of Section 01400.
 - 1. Submit 3 copies of in-progress inspection reports.
- E. Reports: Indicate procedures followed; ambient temperatures, humidity, wind velocity during application, work in progress and observations.

1.7 QUALITY ASSURANCE

- A. Manufacturer: Company specializing in manufacturing the products specified in this section with five years documented experience.
- B. Applicator: Company specializing in performing the work of this section with five continuous years documented experience as an approved applicator of one of the specified manufacturer's.
- C. Be certified by the State of Illinois in accordance with the Illinois Roofing Industry Licensing Act, Senate Bill 1664, as amended.
- D. Have all crew members trained by the SPM manufacturer in the installation of their system. Written certification of same must be forwarded upon request.
- E. Have installed five loose laid ballasted EPDM roof systems within the last year, 300 squares or larger.
- F. Roofing Contractor to be pre-qualified by the Architect prior to their receiving drawings. Pre Qualification forms are available from the Architect and must be returned for reviews, 100% complete, 10 working days prior to the Bid Opening Date. It is the responsibility of the roofing contractor to verify their current status. Non-prequalified contractor's bids will not be opened and those suggested by General Contractors will be rejected.
- G. Perform work in accordance with current published manufacturer's instructions and recommendations.

1.8 REGULATORY REQUIREMENTS

- A. Conform to applicable code for roof assembly fire hazard requirements.
- B. UL 790: Class A Fire Hazard Classification.
- C. FM 4470: Roof Assembly Classification, of Class 1 Construction, wind uplift requirement of I-90, in accordance with FM Construction Bulletin 1-28.

1.9 PRE-INSTALLATION MEETING

- A. Section 01300 - Administrative Requirements: Pre-Installation meeting.
- B. Convene one week before starting work of this section.
- C. Roof Foreman for project - MUST BE IN ATTENDANCE.

1.10 DELIVERY, STORAGE, AND PROTECTION

- A. Section 01600 - Product Requirements: Transport, handle, store, and protect products.
- B. Store products on clean raised pallets in weather protected environment, clear of ground and moisture per manufacturer's recommendations.
- C. Deliver all materials in manufacturer's original, unopened containers and rolls with all labels intact and legible.
- D. Deliver materials requiring fire resistance classification packaged with labels attached as required by the labeling service.
- E. Deliver materials in sufficient time and quality to allow continuity of work and compliance with approved construction schedule.
- F. Store rolled goods on end and handle rolled goods in manner to prevent damage to edges or ends.
- G. Provide continuous protection of materials against damage or deterioration.
- H. Remove damaged or defective materials from site.
- I. Roof Insulation:
 - 1. Store insulation on clean, raised platforms, remove manufacturer's wrappings and cover with breathable, waterproof weather protective coverings.

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2. Provide continuous protection of insulation materials against wetting and moisture absorption.
 3. Remove wet insulation materials from the project site.
 4. Once insulation becomes wet, it will be removed from the site and not used. Wet insulation which then dries shall be removed from the site, the same as wet insulation.
- J. Comply with fire and safety regulations.
- K. SPM splice cleaner to be contained in UL approved safety cans at all times.
- L. All materials shall be new.
- M. Do not store material or park vehicles/dumpsters in front of doors.
- N. No materials shall be stored on any new or existing roofing system.

1.11 ENVIRONMENTAL REQUIREMENTS

- A. Section 01600 - Product Requirements: Environmental conditions affecting products on site.
- B. Do not apply EPDM roofing membrane during inclement weather and/or ambient temperatures below 20 degrees F or above 95 degrees F.
- C. Do not apply roofing membrane to damp or frozen deck surface.
- D. Do not expose materials vulnerable to water or sun damage in quantities greater than can be weatherproofed during same day.
- E. All SPM sealants and adhesives must be kept at 60 degrees F prior to installation when the ambient temperature falls below 40 degrees.

1.12 COORDINATION

- A. Coordinate work under provisions of Section 01300.
- B. Coordinate the work with the installation of trades whose impinges on the roofing and of associated metal flashings, as the work of this section proceeds.

1.13 PROTECTION

- A. Avoid heavy traffic on heavy work.
- B. Restore to original condition or replace all the work or materials damaged by roofing operations.
- C. Protect the paving, grass and building walls adjacent to hoists and kettles prior to starting work.
 1. Lap all suitable protective materials at least 6".
 2. Secure protective coverings against wind.
 3. Leave protective covering in place for duration of roofing work.
 4. Repair any damage to existing conditions caused by work of this section.
- D. Remove protection upon completion of the roofing work.

1.14 WARRANTY

- A. Refer to Section 01780 - Closeout Submittals for additional information.
- B. Correct defective work within a two year period after Substantial Completion for damage to building resulting from failure to prevent penetration of water.
- C. General Contractor: To provide manufacturer's 15 year total roofing system warranty for roofing system, guaranteeing the materials manufacturer will pay for repairs to stop the leaks resulting from the natural deterioration of the membrane or from any errors in application of the membrane.
 1. Carlisle Golden Seal Roofing System Warranty: No. 85-5-938SM.
 2. Firestone Red Shield Roofing System Limited Warranty: July, 1994; 7/94 - Item #815.
 3. Gencorp Inc.; EPDM Roofing System Warranty; 1996; 10-96
 4. Manville Roofing Systems Gold Shield Roofing System Guarantee: October 1994; SI-645-2 (10/94).
 5. Versico Roofing Systems Total System Warranty.
 6. Warranty shall include the asphalt used to fully adhere the polyisocyanurate and high density wood fiber board.

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- D. The guarantee shall start from the day of inspection by the manufacturer's representative. The date shall be established as the date the Architect and the manufacturer's representative inspect the work and find that all work is complete and forms a watertight installation.
- E. The roofing contractor shall notify the Architect in writing when the roof is complete for final inspection.
- F. Following raising and reinstallation of the mechanical unit curbs, verify in writing that all units are in working order.
- G. Following the complete installation of the roofing system and sheet metal, all roof drain downspouts are to be rodded clean and written verification submitted verifying all roof drain downspouts are in working order.
- H. Completed Operations Inspection:
 - 1. Upon completion of installation of EPDM roof system, an inspection of the entire roof system shall be made by Contractor to determine compliance with manufacturer's requirements. Submit written notice of same in accord with Section 01700.
 - 2. Upon completion of installation of EPDM roof system, Manufacturer shall certify in writing to the Architect that materials, workmanship, and installation were in accordance with the manufacturer's printed instructions and current recommendations.
- I. See Section 01780 - Closeout Submittals, for additional warranty requirements.

PART 2 – PRODUCTS

2.1 MANUFACTURERS- MEMBRANE MATERIAL

- A. Firestone Building Products Company, 525 Congressional Blvd., Carmel, IN 46032 Phone: (317) 575-7000.
- B. Manville Roofing Systems, P.O. Box 5108, Denver, CO 80217-5108
- C. Carlisle Syntec Incorporated, P.O. Box 7000, Carlisle, PA 1701 Phone: 800-4-SYNTEC.
- D. Genflex Roofing Systems, 1722 Indian Wood Circle, Suite A, Maumee, OH 43537
- E. Jersico Roofing Systems Total System Warranty, 3485 Fortuna Drive, Akron, OH. 44312. Phone: 800-992-7663.
- F. Section 01600 - Materials and Equipment: Product options. Substitutions: Not permitted.

2.2 MEMBRANE AND ASSOCIATED MATERIALS

- A. Membrane: EPDM reinforced, 60 mil thick.

1. Properties	Test	Pass Test
2. Tensile Strength	ASTM D412	1305 psi
3. Elongation	ASTM D412	350%
4. Tear Strength	ASTM D624 Die C	175#/in.
5. Water Absorption	ASTM E96	0.1 perms
6. Moisture Vapor Perms	ASTM E96	0.1 perms
7. Resistant to Outdoor Weathering	ASTM D22	No cracks- No crazing
8. Low Temperature Brittleness	ASTM D746	-75 degrees F.
9. Ozone Resistance	ASTM D1149	No cracks
- B. Seaming Materials: As recommended by membrane manufacturer.

2.3 ADHESIVE MATERIALS

- A. Surface Conditioner: Compatible with membrane, as recommended by membrane manufacturer.
- B. Membrane Adhesives: As recommended by membrane manufacturer.
- C. Insulation Adhesive: As recommended by insulation manufacturer.
- D. Thinner and Cleaner: As recommended by adhesive manufacturer, compatible with sheet membrane.

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2.4 SUBSTRATE COVERING MATERIALS

- A. Cover Board: Facing Compatible with roofing membrane, ½" thickness high density, closed cell, polyisocyanurate equal to Firestone Isogard HD as supplied by EPDM manufacturer. Install as per recommendations of cover board manufacturer.
- B. 2 ply Vapor retarder

2.5 INSULATION

- A. Manufacturers:
 - 1. Carlisle Syntec Incorporated.
 - 2. Firestone Building Products.
 - 3. Genflex Roofing Systems.
 - 4. Manville Roofing Products.
 - 5. Versigard Roofing Systems.
 - 6. Section 01600 - Product Requirements: Product options. Substitutions: Not permitted.
- B. Polyisocyanurate foam panels shall be HCFC free and formulated with hydrocarbon blowing agents chemically bonded during the foaming process to facers on top and bottom surfaces.
- C. Flat Insulation: Flat rigid board conforming to ASTM C1289 -01 Type II, Class I, Grade II, UL 1256 No. 120 and 123, UL 790 (ASTM E108) Class A, UI 263 (ASTM E119) FM 4450 / 4470 Class I fire rating, polyisocyanurate rigid board, both faces surfaced with fiber reinforced faces, with the following characteristics:
 - 1. Board Density: 2.0 lb/cu ft
 - 2. Board Size: 4'-0" x 4'-0" or 4'-0" x 8'-0
 - 3. Board Thickness: 2 and 2.5 inches
 - 4. Thermal Conductivity: LTTR value of 6/inch per ASTM C1303.
 - 5. Board Compressive Resistance: 20 psi min. PER ASTM D 1621
 - 6. Board Edges: Square
- D. Tapered Insulation: Conforming to ASTM C1289 -01 Type II, Class I, Grade II, UL 1256 No. 120 and 123, UL 790 (ASTM E108) Class A, UI 263 (ASTM E119) FM 4450 / 4470 Class I fire rating, polyisocyanurate rigid board, both faces surfaced with fiber reinforced faces, with the following characteristics:
 - 1. Board Density 2.0 lb/cu ft
 - 2. Board Size 4'-0" x 4'-0"
 - 3. Board Taper Beginning thickness 1/2" minimum 1/8 inch/ft. slope.
 - 4. Thermal Conductivity Aged R value of 5.56/inch as per ASTM C1303.
 - 5. Board Edges Square
 - 6. Board Compressive Resistance 20 psi min.
- E. Cover board: Facing Compatible with roofing membrane, ½" thickness high density, closed cell, polyisocyanurate equal to Firestone Isogard HD as supplied by EPDM manufacturer. Install as per recommendations of cover board manufacturer.

2.6 FLASHINGS

- A. Flexible Flashings same material as membrane.
- B. Copings, Fascias, Counterflashings and Misc. Sheet Metal: As specified in Section 07620.
- C. Control or Expansion Joint Flashing: As specified in Section 07620.

2.7 ACCESSORIES

- A. Prefabricated Roof Specialties.
- B. Tapered Edge Strips: Cover Board, compatible with EPDM tapered edge strip manufactured configuration as detailed. Provided by EPDM membrane manufacturer.
- C. Sheathing Adhesive: Non-combustible type, for adhering gypsum sheathing to metal deck.
- D. Sheathing Joint Tape: Paper type.
- E. Insulation Joint Tape: Asphalt treated glass fiber reinforced; 6 inches wide; self adhering.
- F. Cover Strips: 6 inch minimum widths semi-cured self adhering EPDM as supplied by roof system manufacturer and provided by contractor.

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- G. Roofing Nails: Ring shank aluminum, size as required to suit application with 1" plastic washer heads.
- H. Insulation Fasteners: Appropriate for purpose intended and approved by Factory Mutual and system manufacturer; length required for thickness of material with metal washers; manufactured by EPDM manufacturer.
- I. Sealants: As recommended by membrane manufacturer.
- J. Preformed Boots: Flexible boot with self adhering flange for pipe penetrations through membrane by membrane manufacturer.
- K. SPM Manufacturers Water Cut-Off Mastic: Provide as needed to sheet metal manufacturer.
- L. Foam Adhesive: PL200 Panel and Foam Adhesive by Rexnord Chemical Products, Minneapolis, MN.
- M. Steep Asphalt: Type III, ASTM 312.
- N. Rosin Paper.
- O. Finishing Felts/Fiberglass Felts: Type IV, ASTM 2178.
- P. Fiberglass Base Sheet: Type II, ASTM 4601.
- Q. Self-Adhering Vapor Retarder.
- R. Miro Pipe Curbs.
- S. Termination Bars: 1/8 by 1 inch minimum as supplied by roofing manufacturer and provided by contractor.

PART 3 – EXECUTION

3.1 EXAMINATION

- A. Verify that surfaces and site conditions are ready to receive work.
- B. Verify deck is supported and secure.
- C. Verify deck is clean and smooth, free of depressions, waves, or projections, properly sloped to drains.
- D. Verify deck surfaces are dry and free of snow or ice. Confirm dry deck by moisture meter with 12 percent moisture maximum.
 - 1. Cast-in-place concrete must cure a minimum of 28 days prior to the installation of vapor barrier.
- E. Verify adjacent precast concrete roof members do not vary more than 1/4 in height. Verify grout keys are filled flush.
- F. Verify roof openings, curbs, pipes, sleeves, ducts, and vents through roof are solidly set and wood blocking is in place.
- G. Verify that all work of subcontractors which penetrates roof deck or requires men and equipment to traverse roof deck has been completed.
- H. Do not issue a proceed order to the subcontractor or proceed with work until all defects are corrected to satisfaction of and with written approval of the roofing system manufacturer.
- I. Repair any minor sections of the roof deck which may have been damaged to provide smooth level surface.
- J. Do not install any roof insulation until all perimeter roof edge wood blocking is installed. All wood blocking shall be ACQ Type D treated lumber, installed with staggered and scarfed joints, without buckles or warps and be screw fastened.
- K. Verify that all roof edge perimeter conditions are constructed prior to roof system installation.

3.2 PREPARATION - METAL DECK

- A. Install preformed sound absorbing fiber insulation strips supplied by Section 05310, in acoustic deck flutes; in accordance with manufacturer's instructions.
- B. Install gypsum sheathing on metal deck with FM approved screw fasteners and stress plates at one per every two square feet, into top flute of metal roof deck only.
- C. Lay sheathing with long side at right angle to flutes; stagger end joints; provide support at ends.
- D. Cut sheathing cleanly and accurately at roof breaks and protrusions to provide smooth surface. Tape joints.

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- E. Mechanically fasten sheathing at full roof area using FM approved screw fasteners and stress plates at one per every two square feet.
- F. Adhere sheathing to roof deck in accordance with the adhesive manufacturer's printed recommendations.
- G. Mechanically fasten sheathing to roof deck, in accordance with Factory Mutual requirements.

3.3 INSTALLATION

- A. Install roofing with flashing systems and accessory items in strict accordance with system manufacturer's printed instructions current at the date of bidding documents. When items of conflict arise between the manufacturer's recommendations and the contract documents, the more stringent will govern unless it violates manufacturer's warranty requirements.

3.4 VAPOR RETARDER APPLICATION

- A. Vapor Retarder: 3 Ply Asphalt Adhesive
 - 1. Kettle Temperatures:
 - a. Each kettle shall be provided with a thermometer in good working order.
 - b. Heating of Asphalt: 525 degrees F per manufacturer's recommendation.
 - c. Application: Steep Asphalt Manufacturer's published EVT with a range of 25 degrees + or -
 - 2. Asphalt Application:
 - a. Roofing materials shall not be applied when moisture, in any form such as dew, can be seen or felt on the surface to which the materials are to be applied. Properly apply waterproofing.
 - b. Materials shall not be applied when any foaming, blistering or bubbling of the hot asphalt occurs.
 - c. All hot asphalt applications shall be maintained within 25 degrees F or asphalt's EVT temperature, as supplied by the material manufacturer. Asphalt temperature shall never fall below 400 degrees F. at the point of membrane application. The kettle temperatures shall never exceed the manufacturer recommended maximum temperature.
 - 3. Metal Roof Decks:
 - a. Install 1/2" layer of Coverboard prime and mechanically fasten with FM approved screw fasteners and stress plates at a rate of 1 per 2 square feet into top flute of metal roof deck only.
 - 1) Errantly installed fasteners into the bottom flute are to be removed.
 - b. Starting at the low point, embed base sheet mopped to the entire surface of the insulation with steep asphalt at a rate of 20 lbs. per square feet. Lap sides 2". Lap ends 6".
 - c. Starting at the low point, mop in finishing felts solid over base sheet with approximately 20 lbs. per square of steep asphalt, and while hot, embed finishing felt lapping sides a minimum of 4" and lapping the ends of the roll a minimum of 6". Offset base sheet felt 12".
 - d. Set third ply offset 12" from 2nd finishing felt.
 - e. Cover exposed vapor barrier felts with a glaze coat of asphalt, utilizing a squeegee application of 10 lbs. per square on the day of felt installation.

3.5 INSULATION APPLICATION Adhesive Application: Asphalt or Spray Foam

- A. Ensure vapor retarder is clean and dry.
- B. Apply adhesive to deck in accordance with adhesive and insulation manufacturer's instructions. Embed insulation into adhesive with full contact. Step into place and position so that no cupping occurs.
- C. Apply adhesive to the top surface of insulation. Embed the second layer of insulation into adhesive, with joints staggered minimum 12 inch from joints of first layer.
- D. Place the constant thickness first layer and the tapered thickness insulation second layer to the required slope pattern in accordance with manufacturer's instructions.

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- E. Minimum total Insulation thickness: 2 inches.
- F. Place Boards perpendicular to deck flutes with edges over top flute surface for bearing support.
- G. Lay boards with edges in moderate contact without forcing. Cut insulation to fit neatly to perimeter blocking and around penetrations through roof.
- H. Lay tapered boards in full compliance with approved tapered insulation shop drawings layout.
- I. Apply no more insulation than can be covered with high density wood fiberboard in same day.
- J. Tape joints of insulation in accordance with insulation manufacturer's instruction.
- K. Leading edge of tapered insulation shall be 1/2" with 0" to 1/2" tapered edge strips provided for a flush transition. Fully adhere.
- L. Install two-way tapered saddles and edge strips in adhesive, as indicated on the drawings. Step into place and position so that no cupping occurs.
- M. Insulation shall have surface joints 1/4" or less in width.
- N. Repair all joints or holes greater than 1/4" in diameter with same material.
- O. Field cut tapered and base insulation to fit around the differing deck elevations and roof curbs.
- P. Tapered insulation shall originate at center of the roof drain and be cut perpendicular to the drain flange at the clamping ring.

3.6 INSULATION APPLICATION: Mechanically Fastened

- A. Ensure vapor retarder is clean and dry.
- B. Mechanically fasten insulation to deck in accordance with insulation manufacturer's instructions, utilizing FM approved screw fasteners and stress plates at one per two square feet using stand-up pneumatic screw fasteners hand-gun installation tool (e.g. Accutrac 11 by Buildex) into top flute of metal deck only.
- C. Place the second layer of insulation with joints staggered minimum of 18 inches from joints of first layer.
- D. Place one FM approved screw fastener and stress plate per 2 square feet of insulation board into top flute of metal roof deck.
- E. Place the constant thickness first layer and the tapered thickness insulation second layer to the required slope pattern in accordance with manufacturer's instructions.
- F. Minimum total Insulation thickness: 2 inches.
- G. Place boards perpendicular to deck flutes with edges over to flute surface for bearing support.
- H. Lay boards with edges in moderate contact without forcing. Cut insulation to fit neatly to perimeter blocking and around penetrations through roof.
- I. Lay tapered boards in full compliance with approved tapered insulation shop drawings layout.
- J. Tape joints of insulation in accordance with insulation manufacturer's instructions.
- K. Leading edge of tapered insulation shall be 1/2" with 0" to 1/2" tapered edge strips provided for a flush transition. Mechanically fasten tapered edge strips @ 1"-0" o.c.
- L. Install two-way tapered saddles and edge strips in hot asphalt, as indicated on the drawings. Mechanically fasten.
- M. Top layer of insulation shall have surface joints 1/4" or less in width.
- N. Repair all joints or holes greater than 1/4" in diameter with same material or spray foam insulation.
- O. Field cut tapered and base insulation to fit around the differing deck elevations and roof curbs.
- P. Tapered insulation shall originate at center of the roof drain and be cut perpendicular to the drain flange at the clamping ring.

3.7 MEMBRANE

- A. Install reinforced 60 mil EPDM securement strip at the perimeter conditions.
- B. Position membrane without stretching over the substrate.
- C. Allow the membrane to relax for approximately 1/2 hour before adhering.
- D. Fold sheet in half longitudinally.
- E. Apply bonding adhesive to insulation and SPM after adhesive has dried to where it does not string or stick when pushed into with finger.
 - 1. Roll EPDM into bonding adhesive.
 - 2. Broom EPDM flush to insulation to achieve positive bonding.

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- F. Repeat steps B through E for remaining portion of the roof.
- G. Membrane should be fully adhered to insulation and perimeter wood blocking with bond adhesive and to securement strip with splice adhesive. Membrane should extend up and over perimeter wood blocking and down 1" minimum onto the masonry, fully adhere and nail 6" on center with cap nails on the same day installed.
- H. Exposed corners of the perimeter wood blocking are to be flashed with uncured EPDM extending 1" down onto masonry and nailed at 6" on center with ecap nails.
- I. Install water cut-offs at end of the day's work using water cut-off mastic. Remove water cut-off mastic prior to beginning the next day's work.
- J. Where applicable, fold the EPDM field sheet into corners and create a "pig's ear" to eliminate excess material. Do not cut membrane. Adhere the pig's ear to the EPDM with splice adhesive.
- K. Lap joints shall be a minimum of 5'-0" from roof drains.
 - 1. Seams shall be water lapped.

3.8 LAP SEAM TAPE SPLICES

- A. All field lap seams to be fabricated using tape adhesive.
- B. Shingle lay membrane 5" towards the roof drain.
- C. Mark 1" to the low side of the overlapping sheet with a crayon.
- D. Tack back the overlaying sheet with primer at 4"-0" on center.
- E. Thoroughly clean and prime membrane, both on the overlap and the underlap conditions. Allow to dry.
- F. When washing and priming seam, be sure to wash lengthwise across the sheet, except at factory seams where you should wash in direction of factory seam to remove talc.
- G. Install tape in proper alignment so it will protrude out 1/4" to 1/2" beyond the overlaying sheet.
- H. Roll seam tape with 4" hand roller. Using hand pressure only is not acceptable.
- I. Bring overlapping membrane over the top of the seam tape and release the paper.
- J. Remove release paper by pulling at a 45 degree angle.
- K. At seam tape laps, lap seam tape 1".
- L. Untack the EPDM sheet and allow it to fall into place.
- M. Following removal of the release paper, broom membrane into sealant tape.
- N. Roll seam with 1-1/2" silicone roller at 45 degree angle to the seam.
- O. All products used in seam must be supplied by membrane manufacturer.
- P. All SPM field lap seams to be covered with 6" uncured EPDM, self-adhering EPDM cover strips.
- Q. In irregular areas where 1/4" seam tape is not shown and at tee-joints, patches of uncured EPDM will be required.
- R. At tee-joints, cut out portion of membrane below cover piece to offer full adherence of all pieces of membrane. Following this, install 6" x 6" patches of uncured EPDM over same. Use a soft bristled push broom.
- S. Following approval by Architect and/or membrane manufacturer, clean and prime top of completed seam at the edge and install a continuous bead of SPM lap sealant.

3.9 LAP SEAM COVER STRIPS

- A. Following Architect's inspection of lap seam and the Architect's approval of same, wash the lap seam and EPDM membrane 6" to each side of the lap seam edge to remove any accumulated debris with clean water.
- B. Scrub the power washed lap seam and EPDM membrane with water and soap, using a scrub brush. Rinse thoroughly.
- C. Splice wash cleaned area. Prime 6" to each side of lap splice edge.
- D. Install splice adhesive across the primed membrane with either a roller or a paint brush.
- E. When the splice adhesive has been flashed off and is tacky to a finger-push test, install a 6" piece of self-adhering cured EPDM; center down lap splice edge.
- F. Thoroughly roll the self-adhering cured EPDM cover strip into place with a rubber roller
 - 1. The salvaged adhesive edge of cover strip shall be thoroughly rolled into place.

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2. At cover strip laps and laps with other membranes, carefully roll along the covered edge.
- G. At the cover strip laps, tee joints and other membrane location laps, an uncured EPDM patch, large enough to extend a minimum of 3" beyond the lap in all directions is to be installed. All patch corners are to be ROUNDED.
- H. Splice wash all edges of the cured EPDM cover strip and the uncured EPDM patches.
- I. Install a continuous bead of lap sealant over the edge of the cover strip and patches. Using an SPM lap sealant screed, tool lap sealant into and over the edge of the cover strip and patching membrane.
- J. All lap seam cover strip application to be reviewed and approved by the Architect, prior to the installation of the gravel ballast and/or concrete pavers.

3.10 ROOF CURB AND BASE FLASHING

- A. Secure field membrane by screwing through metal anchor bar at 6" o.c. with approved screw fasteners, where possible install reinforced 60 mil EPDM securement strip previously fastened @ 6" o.c.
- B. Extend roofing membrane up wall or vertical surface or over wood blocking nailer, as indicated and fully adhere to reinforcement strip vertical surface.
- C. Nail top of base flashing to wood nailer strip at 6" on center with 1" hard roofing nails with cap nails.
- D. All flashings and termination shall be done in accord with the manufacturer's standard details or as detailed, whichever is more stringent.
- E. Use prefabricated, self-adhering corners where possible.
- F. Cover anchor bar strips with SPM flashing, extending above anchor bar and 6" out on horizontal roof surface.
- G. Apply appropriate adhesive to both the SPM flashing, the roofing membrane, and the curb wall.
- H. After the lap cement dries to a point where it does not string or stick to the dry finger touch, roll the base flashing into the adhesive and roll with steel roller to achieve positive bonding.
- I. Clean the edges of completed SPM flashing laps with an approved splice wash. Then apply the lap sealant along both edges of the SPM flashing. Feather.
- J. All vertical splice laps shall be covered with a 6" minimum cover strip of uncured EPDM extend 3" beyond horizontally on the flat.
- K. Fold SPM flashing into corners to create a "pig's ear" and eliminate excess material. Do not cut off membrane. Adhere "pig's ear" to SPM.
- L. Cover the vertical surfaces of end wall flashing with the uncured neoprene flashing. Apply SPM lap sealant to exposed edges of uncured neoprene flashing.
- M. Terminate top of flashing on masonry with 1/8 x 1 inch aluminum termination bar with manufacturer-approved expansion anchors at 6" on center.
 1. Install water cut-off mastic between masonry and SPM, prior to installation of termination bar.
 2. Cut EPDM flush to top of termination bar.
 3. Install SPM lap sealant to top of termination bar.
- N. Terminate vertical flashing ends on masonry with 1/8" aluminum termination bar with manufacturer-approved expansion anchors at 4 inches on center.
 1. Install the water-cut off mastic between masonry and SPM prior to installation of the termination bar.
 2. Cut EPDM flush to top of termination bar.
 3. Install SPM lap sealant to top of termination bar.
- O. Cover termination bar with metal counterflashing.
- P. Secure top of flashing on plywood and wood blocking with aluminum nails @ 4" o.c. Seal top of flashing with SPM Lap Sealant installed same day as flashing.
- Q. The 1/8" thick aluminum termination bar must be installed atop base flashing on day base flashing is installed.

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3.11 PIPE PENETRATIONS

- A. Flash pipe with pre-molded pipe flashings with self-adhering flange where installation is possible.
- B. Where the molded pipe flashings cannot be installed, use field fabricated flashing techniques using uncured EPDM.
- C. Raise the pipe penetrations and roof vents to maintain a minimum of 8" projection above surface of new roof surface. Verify that all pipe penetrations extend to a minimum of 8 inches above the finished roof surface.
- D. Apply lap sealant at all flashing edges.
- E. Provide water cut-off mastic between the pipe and molded pipe flashing.
- F. Install stainless steel clamping ring around pipe at top of premolded pipe flashing.
- G. Install SPM lap sealant at top pipe boot/field flashing.
- H. Premolded pipe boot:
 - 1. When flashing must be cut to fit pipe penetration and top of premolded boot is below 8" above SPM, pipe penetration is to be wrapped in uncured EPDM.
 - 2. Top edge is to be a minimum of 8" above the SPM. Premolded pipe boot is then to be installed.
 - 3. Wrap all gas vent pipe penetration with cured EPDM membrane following completion of field flashing.
 - a. Field Flashings
 - 1) Install stainless steel rain cap around pipe and over tip of field flashing.

3.12 ROOF DRAINS

- A. Insert base insulation and tapered insulation under drain extension ring. Twist extension ring tight into insulation.
- B. Originate tapered insulation at center of the drain. Cut high density wood fiber board insulation perpendicular to drain flange at the clamping ring.
- C. Seal between the membrane and drain flange with water cut-off mastic, as indicated in manufacturer's standard details.
- D. Set clamping rings and secure.

3.13 DAILY SEAL

- A. Temporarily seal loose edges of membrane with water cut-off mastic or adhesive at end of the working day. Loose night seals are unacceptable.
 - 1. Surface shall be clean and dry.
 - 2. Apply water cut-off mastic at a rate of 100 lineal feet per gallon, 12" back from edge of sheet onto exposed surface.
 - 3. If necessary, use a trowel to spread material in order to achieve complete seal.
- B. After embedding the membrane in night seal, check for continuous contact. Weight edge, providing continuous pressure over length of the cut off.
- C. When the work is resumed, pull sheet face free before continuing installation.
- D. Cut off and remove a portion of SPM with water cut-off mastic on it.

3.14 FIELD QUALITY CONTROL

- A. Section 01400 - Quality Requirements: Field inspection and Testing.
- B. Correct identified defects or irregularities.
- C. Require site attendance of roofing and insulation materials' manufacturer during installation of the Work.

3.15 CLEANING

- A. Section 01780 - Closeout Submittals: Cleaning installed work.
- B. In areas where finished surfaces are soiled by Work of this section, consult manufacturer of surfaces for cleaning advice and conform to their documented instructions.
- C. Repair or replace defaced or disfigured finishes caused by Work of this section.

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3.16 PROTECTION OF FINISHED WORK

- A. Section 01780 - Closeout Submittals: Protecting installed work.
- B. Protect building surfaces against damage from roofing work.
- C. Where traffic must continue over finished roof membrane, protect surfaces.

END OF SECTION

SECTION 07620

SHEET METAL FLASHING AND TRIM

PART 1 – GENERAL

1.1 SECTION INCLUDES

- A. Flashings, counter-flashings, fabricated sheet metal items, and fabricated sheet metal items, and through wall rigid flashings.
- B. Reglets and accessories.

1.2 RELATED SECTIONS

- A. Section 04810 - Unit Masonry Assemblies: Rigid Through-wall flashings in masonry.
- B. Section 06114 - Wood Blocking and Curbing
- C. Section 07900 - Joint Sealers.

1.3 REFERENCES

- A. ASTM A 666 - Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar; 2000.
- B. ASTM B 370 - Standard Specification for Copper Sheet and Strip for Building Construction; 1998.
- C. ASTM D 226 - Standard Specification for Asphalt-Saturated Organic Felt Used in Roofing and Waterproofing; 1997a.
- D. SMACNA (ASMM) - Architectural Sheet Metal Manual; Sheet Metal and Air Conditioning Contractors' National Association; 1993, Fifth Edition.

1.4 DESIGN REQUIREMENTS

- A. Sheet Metal Flashings: Comply with the criteria of SMACNA "Architectural Sheet Metal Manual." and Copper Development Association "Copper in Architecture - Handbook."

1.5 SUBMITTALS

- A. See Section 01300 - Administrative Requirements, for submittal procedures.
- B. Shop Drawings: Indicate material profile, jointing pattern, jointing details, fastening methods, flashings, terminations, and installation details.
- C. Samples: Submit two full size samples, 12" inches long illustrating typical coping material and finish. Include continuous cleats, backer plates, cover plates and/or drive cleats.

1.6 SUBMITTALS AT PROJECT CLOSEOUT

- A. Section 01700 - Execution Requirements Procedures for submittals.
- B. Warranty: Submit manufacturer's 20 year material warranty. Ensure forms have been completed in Owner's name and registered with manufacturer.
- C. Warranty: Submit contractor's two year workmanship warranty.

1.7 QUALITY ASSURANCE

- A. Perform work in accordance with SMACNA Architectural Sheet Metal Manual requirements and standard details, except as otherwise indicated.
- B. Maintain one copy of each document on site.
- C. Fabricator and Installer Qualifications: Company specializing in sheet metal work with five years of documented experience.

1.8 PRE-INSTALLATION CONFERENCE

- A. See Section 01300 - Administrative Requirements for additional requirements.
- B. Convene one week before starting work of this section.

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SHEET METAL FLASHING AND TRIM

1.9 DELIVERY, STORAGE, AND HANDLING

- A. Section 01600 - Product Requirements: Transport, handle, store, and protect.
- B. Stack material to prevent twisting, bending, and abrasion, and to provide ventilation. Slope metal sheets to ensure drainage.
 - 1. When material is stored on the roof it must be placed on ½" minimum plywood on 1" rigid insulation. Ends of plywood shall exceed end of sheet metal goods by 2'-0".
- C. All field cutting of sheet metal performed over new roofing shall be permitted only where the new roof is protected by ½" minimum plywood on 1" rigid insulation.
- D. Prevent contact with materials which may cause discoloration or staining.

1.10 PROJECT CONDITIONS

- A. Project Coordination: Section 01300 - Administrative Requirements.
- B. Coordinate with the work of Section 04810 for installing recessed flashing reglets and rigid through wall flashings.

1.11 WARRANTY

- A. Section 01780 - Closeout Submittals
- B. Sheet Metal Contractor to issue guarantee of workmanship to correct defective work within a two year period after Date of Substantial Completion. Defective work includes failure of water-tightness or seals and oil canning due to rupture restricted expansion/contractors or faulty workmanship.
- C. Material warranty from the sheet metal manufacturer for a period of 20 years against deterioration of color, chalking and film integrity.

PART 2 – PRODUCTS

2.1 SHEET MATERIALS

- A. Pre-Finished Galvanized Steel: ASTM A 653/A 653M, with G90/Z275 zinc coating; minimum 0.02 inch 24 gauge core steel, shop pre-coated with PVDF coating; color as selected by Architect from Manufacturer's standard range.
 - 1. PVDF (Polyvinylidene Fluoride) Coating: Superior Performance Organic Finish, AAMA 2605; multiple coat, thermally cured fluoropolymer finish system; color as scheduled.
- B. Pre-Finished Aluminum Sheet: ASTM B 209 (ASTM B 209M), H005 alloy, H12 or H14 temper;.063 inch thick; plain finish shop pre coated with PVDF coating of color as selected by Architect from Manufacturer's standard range.
- C. Stainless Steel: ASTM A 666 Type 304, soft temper, 0.015 inch thick; smooth No. 4 finish.
- D. Contractor to coordinate indicated locations of metal type and notify architect of any galvanic conflicts prior to fabrication and/or installation.

2.2 ACCESSORIES

- A. Fasteners: Same material and finish as flashing metal, with soft neoprene washers.
- B. Underlayment: ASTM D 226, organic roofing felt, Type I ("No. 15").
- C. Slip Sheet: Rosin sized building paper.
- D. Primer: Zinc Molybdate type.
- E. Protective Backing Paint: Zinc molybdate alkyd.
- F. Sealant: Polyurethane type, manufactured by:
 - 1. Tremco: Dymeric
 - 2. Sonnoborn: NPI.

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SHEET METAL FLASHING AND TRIM

2.3 FABRICATION - GENERAL

- A. Form sections true to shape, accurate in size, square, and free from distortion or defects.
- B. Fabricate cleats of same material as sheet, minimum 3 inches wide, interlocking with sheet a minimum of 1/2 inch.
 - 1. Drill pilot holes at 4" o.c. for attachment to wood.
 - 2. Drill pilot holes at 6" o.c. for attachment to masonry or concrete.
- C. All fastener locations will have predrilled pilot holes:
 - 1. Nails - 1/4" diameter @ 4" o.c.
 - 2. Screw Fasteners - 5/16" diameter @ 1'-0" o.c.
- D. Form pieces in longest possible lengths.
- E. Hem exposed edges on underside 1/2 inch; miter and seam corners.
- F. Form material with flat lock seams, except where otherwise indicated. At moving joints, use sealed lapped, bayonet-type or interlocking hooked seams.
- G. Fabricate corners from one piece with minimum 24-inch long legs; welded for rigidity, seal with sealant and post finished to match adjacent finish.
- H. Fabricate vertical faces with bottom edge formed outward 1/4 inch (6 mm) and hemmed to form drip.
- I. Fabricate flashings to allow toe to extend 2 inches over roofing gravel. Return and brake edges.

2.4 SOFFIT PANEL

- A. Refer to Spec Section 07410 – Preformed Metal Wall Panels.

2.5 FACTORY FINISHING

- A. PVDF coating: Multiple coat, thermally cured, fluoropolymer system conforming to AAMA 605.2.
- B. Primer Coat: Finish concealed side of metal sheets with primer compatible with finish system, as recommended by finish system manufacturer.
 - 1. All metal materials to be delivered to the site with protective, strippable plastic film.

PART 3 – EXECUTION

3.1 EXAMINATION

- A. Verify of existing conditions before starting work.
- B. Verify roof openings, curbs, pipes, sleeves, ducts, and vents through roof are solidly set, reglets in place, and nailing strips located.
- C. Verify roofing termination and base flashings are in place, sealed, and secure.
 - 1. Verify that surfaces to receive sheet metal are smooth and clean will not impinge upon the integrity of the sheet metal.
- D. Verify that all wood blocking to receive sheet metal is properly installed, anchored without warps and covered with EPDM.
- E. Do not start sheet metal work until conditions relevant to sheet metal work are acceptable. Commencing of work will indicate acceptance of condition.

3.2 PREPARATION

- A. Install starter and edge strips, and cleats before starting installation.
- B. Install surface mounted reglets true to lines and levels. Seal top of reglets with sealant.
- C. Lay out joints to be symmetrical about the building corners. May require more than one run be cut down to attain symmetry.
- D. Paint dissimilar metals with bituminous paint to form a complete barrier.

3.3 INSTALLATION

- A. Secure flashings in place using concealed fasteners as indicated.
 - 1. Apply plastic cement compound between metal flashings and felt flashings.

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- a. Fit flashings tight in place. Make corners square, surfaces true and straight in planes, and lines accurate to profiles. Install work watertight, without buckles, warps, fastening stresses or distortion. Allow for expansion and contraction.
- B. Apply plastic cement compound between metal flashings and felt flashings.
- C. Fit flashings tight in place. Make corners square, surfaces true and straight in planes, and lines accurate to profiles.
- D. Seal metal joints watertight.
- E. Continuous Cleats: Set in water cut-off mastic supplied by the Roofing Contractor or sealant, as indicated in the drawings. Secure to the surface with nail fasteners through 1/4-inch predrilled pilot holes at 4-inch on center.
- F. Verify that height of roof base flashing and termination bar allows for installation of counter-flashing and sealant below weep holes and through-wall flashing.
- G. Copings: Set continuous cleat in a full bed of water cut-off mastic supplied by the roofing contractor. Cover roof edge with rosin paper. Set the outside and inside corners. Secure with 3/4" x 1/4" Atlas HHA stainless steel Type A point screw fasteners with neoprene washers that are covered with sealant, following Architect's approval.
 1. Lay out coping joints symmetrical about the building corners. May require multiple cutting at 10'-0" lengths to achieve same. Install backer plates at joint locations. Nail through predrilled 1/4-inch pilot holes. Apply continuous sealant to backer plate vertical and horizontal surfaces as indicated in drawings.
 2. Run joints at +10'-0", except where the cut pieces are required for symmetry between existing corners.
 3. Secure coping to continuous cleat and pull coping over roof edge wood block. Cut 10'- 0" lengths to size to provide symmetrical placement between existing building corners.
 4. Verify coping is tight to wood blocking. Anchor with 1-1/4" x 1/4" Atlas HHA stainless steel screw fasteners, Type A points with neoprene washers. Cover with sealant, following Architect's approval.
 5. Install sealant to each side of joints.
 6. Install drive cleat.
- H. Fascias:
 1. Set continuous cleat in full bed of [sealant] water cut-off mastic supplied by Roofing Contractor. Secure with nails at 4" on center through 1/4" pre-drilled pilot holes.
 2. Set the outside and inside corners. Secure with nails at 4" o.c. through 1/4" pre-drilled pilot holes.
 3. Lay out fascia joints symmetrical about corners. May require multiple cutting to achieve lengths of 10'-0".
 4. Install backer plates at joint locations in full bed of water cut-off mastic supplied by the roofing contractor. Nail through pre-drilled pilot holes. Install bond breaker tape down the center, as indicated on drawings.
 5. Apply continuous sealant to backer plate vertical and horizontal surfaces as indicated in drawings.
 6. Apply continuous sealant to top of backer plate.
 7. Running joints at +10'-0", except where the cut pieces are required for symmetry between the existing corners.
 8. Secure fascia to continuous cleat and nail at 4" o.c. through 1/4-inch pre-drilled pilot holes.
- I. Counter-flashing:
 1. Overlap the base flashing a minimum of 3".
 2. Install continuous butyl caulk tape to vertical portion of the counter-flashing.
 3. Secure to the masonry with 1-1/4" x 3/16" tapcons with climaseal corrosion resistive coating and neoprene washers at 1'-0" on center through 5/16" pre-drilled pilot holes. Cover with sealant following the Architect's approval.
 4. Lap counter-flashing pieces 3" with bead of sealant and between pieces.
 5. Cover fastener heads with sealant after the Architect's approval.
 6. Fill sealant reservoir with sealant to shed water.
 7. Counter-flashing Corner Pieces: Install pieces per Steps 1 through 6 in 3.3.I. above.

SECTION 07620

SHEET METAL FLASHING AND TRIM

- J. End Wall Flashings:
 - 1. Set in full bed of water cut-off mastic.
 - 2. Secure with screw fasteners through ¼" pre-drilled pilot holes as indicated on drawings.
 - 3. Coordinate installation with roofing contractor.
 - 4. Have the roofing contractor flash in vertical flange of end wall flashing.
 - 5. Install coping, or standing seam siding, over the end wall flashing by:
 - 6. Secure to end wall flashing vertical flange and pulling coping over the roof edge wood blocking, or, securing to the continuous clip and laying against mansard
- K. Thru Wall Flashing: Coordinate with masonry contractor.
- L. Miscellaneous Flashings: Install as indicated on drawings.
 - 1. Coordinate with interfacing contractors.

3.4 CLEANING

- A. Leave material clean and free of stains.
- B. Remove all sheet metal debris from roof top daily.
- C. Remove all sheet metal debris from site daily.

3.5 FIELD QUALITY CONTROL

- A. See Section 01400 - Quality Requirements, for field inspection requirements.
- B. Inspection will involve surveillance of work during installation to ascertain compliance with specified requirements.

END OF SECTION

SECTION 07815

SPRAYED-ON FIREPROOFING

PART 1 – GENERAL

1.1 SECTION INCLUDES

- A. Fireproofing (SFRM) of interior structural steel.
- B. Fireproofing (SFRM) of interior steel decking and related items.

1.2 RELATED SECTIONS

- A. Section 05120 - Structural Steel.
- B. Section 05310 - Steel Deck.
- C. Section 07840 - Firestopping.

1.3 REFERENCES

- A. ASTM E 84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2001.
- B. ASTM E 605 - Standard Test Methods for Thickness and Density of Sprayed Fire-Resistive Material (SFRM) Applied to Structural Members; 1993 (Reapproved 2000).
- C. ASTM E 736 - Standard Test Method For Cohesion/Adhesion of Sprayed Fire-Resistive Materials Applied to Structural Members; 2000.
- D. ASTM E 760 - Standard Test Method for Effect of Impact on Bonding of Sprayed Fire-Resistive Material Applied to Structural Members; 1992 (Reapproved 2000).
- E. ASTM E 761 - Standard Test Method for Compressive Strength of Sprayed Fire-Resistive Material Applied to Structural Members; 1992 (Reapproved 2000).
- F. ASTM G 21 - Standard Practice for Determining Resistance of Synthetic Polymeric Materials to Fungi (current edition).
- G. BOCA Basic Building code, 1996 edition.
- H. UL (FRD) - Fire Resistance Directory; Underwriters Laboratories Inc.; current edition.

1.4 PERFORMANCE REQUIREMENTS

- A. Sprayed-On Fireproofing Systems: Provide fire rated assembly ratings conforming to BOCA Basic Building code, 1996 edition.

1.5 SUBMITTALS

- A. See Section 01300 - Administrative Requirements, for submittals procedures.
- B. Product Data: Provide data indicating product characteristics, performance criteria, and limitations of use.
- C. Test Reports: Reports from reputable independent testing agencies for proposed products, indicating compliance with specified criteria, conducted under conditions similar to those on project, for:
 - 1. Bond Strength.
 - 2. Bond Impact.
 - 3. Compressive Strength.
 - 4. Density.
 - 5. Fire tests using substrate materials similar those on project.
 - 6. Air erosion.
 - 7. Fungal Resistance of Materials: No observed growth on specimens per ASTM G 21
- D. Requiring special attention or mix additives that may be required to conform to no observed growth on specimens per ASTM G 21.
- E. Manufacturer's Certificate: Certify that sprayed-on fireproofing products meet or exceed requirements of contract documents.
- F. Manufacturer's Field Services Reports: Submit the following in accordance with Section 01000, Article 01410 - Testing Laboratory Services:
 - 1. Qualifications of manufacturer's field observer.
 - 2. Observer's report.
 - 3. Contractor's report of observer's activities on site.
 - 4. Qualifications of manufacturer's field observer.

SECTION 07815

SPRAYED-ON FIREPROOFING

1.6 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section, with not less than three years of documented experience.
- B. Applicator Qualifications: Company specializing in performing the work of this section, and approved by manufacturer.

1.7 REGULATORY REQUIREMENTS

- A. Conform to applicable code for fire resistance ratings.
- B. Provide certificate of compliance for fireproofing materials to authority having jurisdiction, indicating approval for use on this project.

1.8 PROJECT CONDITIONS

- A. Sequence work in conjunction with placement of ceiling hanger tabs.
- B. Do not allow roof traffic during installation of roof fireproofing and drying period.

1.9 ENVIRONMENTAL REQUIREMENTS

- A. Do not apply spray fireproofing when temperature of substrate material and surrounding air is below 40 degrees F.
- B. Provide ventilation in areas to receive fireproofing during application and 24 hours afterward, to dry applied material.
- C. Fungal Resistance of Materials: No observed growth on specimens per ASTM G 21.
- D. Provide temporary enclosure to prevent spray from contaminating air.

1.10 WARRANTY

- A. See Section 01780 - Closeout Submittals, for additional warranty requirements.
- B. Correct defective Work within a five year period after Date of Substantial Completion.
 - 1. Include coverage for fireproofing to remain free from cracking, checking, dusting, flaking, spalling, separation, and blistering.
 - 2. Reinstall or repair failures that occur within warranty period.

PART 2 – PRODUCTS

2.1 MANUFACTURERS

- A. Sprayed-On Fireproofing:
 - 1. Carbolite Company: www.carbolite.com.
 - 2. Grace Construction Products: www.graceconstruction.com.
 - 3. Isolatek International: www.cafco.com.
 - 4. Southwest Vermiculite Co. Inc; Product _____.
 - 5. Substitutions: See Section 01600 - Product Requirements.

2.2 FIREPROOFING

- A. Low Density : Factory mixed, material blended for uniform texture with vermiculite or lightweight synthetic aggregate, and conforming to the following requirements:
 - 1. Bond Strength: ASTM E 736, 200 psf when set and dry.
 - 2. Bond Impact: ASTM E 760, no cracking, flaking or delamination.
 - 3. Dry Density: ASTM E 605, minimum average density of 14 lb/cu ft, with minimum individual density of any test sample of 13 lb/cu ft.
 - 4. Compressive Strength: ASTM E 761, minimum 7.0 psi.
 - 5. Surface Burning Characteristics: Maximum flame spread of 0 and maximum smoke developed of 0, when tested in accordance with ASTM E 84.

SECTION 07815

SPRAYED-ON FIREPROOFING

- B. Acceptable Low Density Manufacturers and Products:
 - 1. Carboline Company; Product Pyrolite 15: www.carboline.com.
 - 2. Grace Construction Products; Product Monokote Type MK-6/HY; Monokote Type MK-6s: www.graceconstruction.com.
 - 3. Isolatek International; Product CAFCO BLAZE-SHIELD II; CAFCO 300: www.cafco.com.
 - 4. Southwest Vermiculite Co. Inc; Product TYPE 5: www.type5.com.
 - 5. Substitutions: See Section 01600 - Product Requirements.
- C. Medium Density: Factory mixed, blended for uniform texture with mineral aggregates or mineral fibers and additives, without chlorides, approved for exterior use and conforming to the following requirements:
 - 1. Bond Strength: ASTM E 736, 2000 psf when set and dry.
 - 2. Bond Impact: ASTM E 760, no cracking, flaking or delamination.
 - 3. Dry Density: ASTM E 605, minimum density of 21 lb/cu ft.
 - 4. Compressive Strength: ASTM E 761, minimum 65 psi.
 - 5. Surface Burning Characteristics: Maximum flame spread of 0 and maximum smoke developed of 0, when tested in accordance with ASTM E 84.
- D. Acceptable Medium Density Manufacturers and Products:
 - 1. Carboline Company; Product Pyrolite 22: www.carboline.com.
 - 2. Grace Construction Products; Product Monokote Type Z-106: www.graceconstruction.com.
 - 3. Isolatek International; Product CAFCO 400: www.cafco.com.
 - 4. Southwest Vermiculite Co. Inc; Product TYPE 7: www.type5.com.
 - 5. Substitutions: See Section 01600 - Product Requirements.
- E. High Density: Factory mixed, blended for uniform texture with mineral aggregates and additives, without chlorides, approved for exterior use and conforming to the following requirements:
 - 1. Bond Strength: ASTM E 736, 2000 psf when set and dry.
 - 2. Bond Impact: ASTM E 760, no cracking, flaking or delamination.
 - 3. Dry Density: ASTM E 605, minimum density of 39 lb/cu ft.
 - 4. Compressive Strength: ASTM E 761, minimum 300 psi.
 - 5. Surface Burning Characteristics: Maximum flame spread of 0 and maximum smoke developed of 0, when tested in accordance with ASTM E 84.
- F. Acceptable High Density Manufacturers and Products:
 - 1. Carboline Company; Product Pyrocrete 240: www.carboline.com.
 - 2. Grace Construction Products; Product Monokote Z-146: www.graceconstruction.com.
 - 3. Isolatek International; Product Mandoval Fendolite M-II; CAFCO 800: www.cafco.com.
 - 4. Southwest Vermiculite Co. Inc; Product TYPE 1XR: www.type5.com.
 - 5. Substitutions: See Section 01600 - Product Requirements.

2.3 ACCESSORIES

- A. Primer Adhesive: Of type recommended by fireproofing manufacturer.
- B. Water: Clean, potable.

PART 3 – EXECUTION

3.1 EXAMINATION

- A. Verify that surfaces are ready to receive fireproofing.
- B. Verify that clips, hangers, supports, sleeves, and other items required to penetrate fireproofing are in place.
- C. Verify that ducts, piping, equipment, or other items that would interfere with application of fireproofing have not been installed.
- D. Verify that voids and cracks in substrate have been filled. Verify that projections have been removed where fireproofing will be exposed to view as a finish material.

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SPRAYED-ON FIREPROOFING

3.2 PREPARATION

- A. Perform tests as recommended by fireproofing manufacturer in situations where adhesion of fireproofing to substrate is in question.
- B. Remove incompatible materials that could affect bond by scraping, brushing, scrubbing, or sandblasting.
- C. Prepare substrates to receive fireproofing in strict accordance with instructions of fireproofing manufacturer.
- D. Protect surfaces not scheduled for fireproofing and equipment from damage by overspray, fall-out, and dusting.
- E. Close off and seal duct work in areas where fireproofing is being applied.

3.3 APPLICATION

- A. Apply primer adhesive in accordance with manufacturer's instructions.
- B. Apply fireproofing in sufficient thickness to achieve required ratings, with as many passes as necessary to cover with monolithic blanket of uniform density and texture.

3.4 FIELD QUALITY CONTROL

- A. Inspect the installed fireproofing after application and curing for integrity, prior to its concealment. Ensure that actual thicknesses, densities, and bond strengths meet requirements for specified ratings.
- B. Re-inspect the installed fireproofing for integrity of fire protection, after installation of subsequent Work.

3.5 CLEANING

- A. Remove excess material, overspray, droppings, and debris.
- B. Remove fireproofing from materials and surfaces not required to be fireproofed.

END OF SECTION

SECTION 07840

FIRESTOPPING

PART 1 – GENERAL

1.1 SECTION INCLUDES

- A. Firestopping materials.
- B. Firestopping of all penetrations and interruptions to fire rated assemblies, whether indicated on drawings or not, and other openings indicated.

1.2 REFERENCES

- A. UL (FRD) - Fire Resistance Directory; Underwriters Laboratories Inc.; current edition.

1.3 SUBMITTALS

- A. See Section 01300 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide data on product characteristics and fire rating.
- C. Manufacturer's Installation Instructions: Indicate preparation and installation instructions.
- D. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.

1.4 QUALITY ASSURANCE

- A. Fire Testing: Provide firestopping assemblies of designs which provide the specified fire ratings when tested in accordance with methods indicated.
- B. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum five years documented experience.
- C. Installer Qualifications: Company specializing in performing the work of this section and:
 - 1. Approved by Factory Mutual Research under FM Standard 4991, Approval of Firestop Contractors, or meeting any two of the following requirements:
 - a. With minimum 3 years documented experience installing work of this type.
 - b. Able to show at least 5 satisfactorily completed projects of comparable size and type.
 - c. Licensed by authority having jurisdiction.
 - d. Approved by firestopping manufacturer.

1.5 MOCK-UP

- A. Install one firestopping assembly representative of each fire rating design required on project.
 - 1. Where one design may be used for different penetrating items or in different wall constructions, install one assembly for each different combination.
 - 2. Where firestopping is intended to fill a linear opening, install minimum of 1 linear ft.
- B. If accepted, mock-up will represent minimum standard for the Work.
- C. If accepted, mock-up may remain as part of the Work. Remove and replace mock-ups not accepted.

1.6 ENVIRONMENTAL REQUIREMENTS

- A. Comply with firestopping manufacturer's recommendations for temperature and conditions during and after installation. Maintain minimum temperature before, during, and for 3 days after installation of materials.
- B. Provide ventilation in areas where solvent-cured materials are being installed.

PART 2 – PRODUCTS

2.1 FIRESTOPPING ASSEMBLIES

- A. Firestopping at Control and Expansion Joints (without Penetrations), of widths 2 inches or less: Any material meeting requirements.
 - 1. Floor-to-Floor:
 - a. UL Design No. FF-DD-0002, FF-D-0005, F Rating 1 & 2 hour.
 - b. UL Design No. FF-D-0011, FF-D-0001, F Rating 3 hour.

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FIRESTOPPING

2. Floor-to-Wall:
 - a. UL Design No. FW-D-0004, FW-D-0005, FW-D-0002, F Rating 1 & 2 hour.
 - b. UL Design No. FFW-D-0007, FW-D-0002, F Rating 3 hour.
3. Wall-to-Wall:
 - a. UL Design No. WW-D-0013, WW-D-0004, WW-D-0017, F Rating 1 & 2 hour.
 - b. UL Design No. WW-D-0013, WW-D-0001, F Rating 3 hour.
4. Head-of-Wall:
 - a. UL Design No. HW-D-0020, HW-D-0043, HW-D-0034, F Rating 1 & 2 hour.
 - b. UL Design No. HW-D-0060, HW-D-0061, F Rating 3 hour.
- B. Firestopping at Metallic Pipe, Conduit, or Tubing Penetrations, of diameter 4 inches or less; for single penetrations: Any material meeting requirements.
 1. Concrete Floors 5 inches in thickness or less:
 - a. UL Design No. C-AJ-1014, C-AJ-1240, C-AJ-1149, F Rating 1 & 2 hour.
 - b. UL Design No. C-AJ-1058, C-AJ-1198, C-AJ-1155, F Rating 3 hour.
 2. Concrete Floors 5 inches in thickness or greater:
 - a. UL Design No. C-AJ-1004, C-AJ-1005, F Rating 1 & 2 hour.
 - b. UL Design No. C-AJ-1004, C-AJ-1005, F Rating 3 & 4 hour.
 3. Roof Slabs 5 inches in thickness or less:
 - a. UL Design No. C-AJ-1014, C-AJ-1240, C-AJ-1149, F Rating 1 & 2 hour.
 - b. UL Design No. C-AJ-1058, C-AJ-1198, C-AJ-1155, F Rating 3 hour.
 4. Roof Slabs 5 inches in thickness or greater:
 - a. UL Design No. C-AJ-1004, C-AJ-1005, F Rating 1 & 2 hour.
 - b. UL Design No. C-AJ-1004, C-AJ-1005, F Rating 3 & 4 hour.
 5. Concrete/Masonry Walls 8 inches in thickness or less:
 - a. UL Design No. C-AJ-1014, C-AJ-1240, C-AJ-1149, F Rating 1 & 2 hour.
 - b. UL Design No. C-AJ-1058, C-AJ-1198, C-AJ-1155, F Rating 3 hour.
 6. Concrete/Masonry Walls 8 inches in thickness or greater:
 - a. UL Design No. C-AJ-1004, C-AJ-1005, F Rating 1 & 2 hour.
 - b. UL Design No. C-AJ-1004, C-AJ-1005, F Rating 3 & 4 hour.
 7. Framed Floors:
 - a. UL Design No. F-C-1002, F-C-1010, F-C-1059, F Rating 1 & 2 hour.
 8. Framed Walls:
 - a. UL Design No. W-L-1001, W-L-1049, W-L-1054, F Rating 1 & 2 hour.
 - b. UL Design No. W-L-1001, W-L-1172, F Rating 3 hour.
- C. Firestopping at Metallic Pipe, Conduit, or Tubing Penetrations, of diameter 4 inches or less; for multiple penetrations: Any material meeting requirements.
 1. Concrete Floors 5 inches in thickness or less:
 - a. UL Design No. C-AJ-1092, C-AJ-1047, C-AJ-1140, F Rating 1 & 2 hour.
 - b. UL Design No. C-AJ-1234, F Rating 3 hour.
 2. Concrete Floors 5 inches in thickness or greater:
 - a. UL Design No. C-AJ-1003, F Rating 1 & 2 hour.
 3. Roof Slabs 5 inches in thickness or less:
 - a. UL Design No. C-AJ-1092, C-AJ-1047, C-AJ-1140, F Rating 1 & 2 hour.
 - b. UL Design No. C-AJ-1234, F Rating 3 hour.
 4. Roof Slabs 5 inches in thickness or greater:
 - a. UL Design No. C-AJ-1003, F Rating 1 & 2 hour.
 5. Concrete/Masonry Walls 8 inches in thickness or less:
 - a. UL Design No. C-AJ-1092, C-AJ-1047, C-AJ-1140, F Rating 1 & 2 hour.
 - b. UL Design No. C-AJ-1234, F Rating 3 hour.
 6. Concrete/Masonry Walls 8 inches in thickness or greater:
 - a. UL Design No. C-AJ-1003, F Rating 1 & 2 hour.
 7. Framed Floors:
 - a. UL Design No. F-C-1065, F-C-1066, F Rating 1 & 2 hour.

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FIRESTOPPING

8. Framed Walls:
 - a. UL Design No. W-L-1001, W-L-1049, W-L-54, F Rating 1 & 2 hour.
 - b. UL Design No. W-L-1001, W-L-1172, F Rating 3 & 4 hour.
- D. Firestopping at Non-Metallic Pipe, Conduit, or Tubing Penetrations, of diameter 4 inches or less; for single penetrations: Any material meeting requirements.
 1. Concrete Floors 5 inches in thickness or less:
 - a. UL Design No. C-AJ-2143, C-AJ-2063, C-AJ-2271, F Rating 1 & 2 hour.
 - b. UL Design No. C-AJ-2117, C-AJ-2038, C-AJ-2271, F Rating 3 hour.
 2. Concrete Floors 5 inches in thickness or greater:
 - a. UL Design No. C-AJ-2001, C-AJ-2002, F Rating 1 & 2 hour.
 - b. UL Design No. C-AJ-2001, C-AJ-2002, F Rating 3 & 4 hour.
 3. Roof Slabs 5 inches in thickness or less:
 - a. UL Design No. C-AJ-2143, C-AJ-2063, C-AJ-2271, F Rating 1 & 2 hour.
 - b. UL Design No. C-AJ-2117, C-AJ-2038, C-AJ-2271, F Rating 3 hour.
 4. Roof Slabs 5 inches in thickness or greater:
 - a. UL Design No. C-AJ-2001, C-AJ-2002, F Rating 1 & 2 hour.
 - b. UL Design No. C-AJ-2001, C-AJ-2002, F Rating 3 & 4 hour.
 5. Concrete/Masonry Walls 8 inches in thickness or less:
 - a. UL Design No. C-AJ-2143, C-AJ-2063, C-AJ-2271, F Rating 1 & 2 hour.
 - b. UL Design No. C-AJ-2117, C-AJ-2038, C-AJ-2271, F Rating 3 hour.
 6. Concrete/Masonry Walls 8 inches in thickness or greater:
 - a. UL Design No. C-AJ-2001, C-AJ-2002, F Rating 1 & 2 hour.
 - b. UL Design No. C-AJ-2001, C-AJ-2002, F Rating 3 & 4 hour.
 7. Framed Floors:
 - a. UL Design No. F-C-2024, F-C-2020, F-C-2025, F Rating 1 & 2 hour.
 8. Framed Walls:
 - a. UL Design No. W-L-2162, W-L-2047, W-L-2075, F Rating 1 & 2 hour.
 - b. UL Design No. W-L-2162, W-L-2195, F Rating 3 hour.
- E. Firestopping at Non-Metallic Pipe, Conduit, or Tubing Penetrations, of diameter 4 inches or less; for multiple penetrations: Any material meeting requirements.
 1. Concrete Floors 5 inches in thickness or less:
 - a. UL Design No. C-AJ-2093, C-AL-2140, F Rating 1 & 2 hour.
 - b. UL Design No. C-AJ-2092, F Rating 3 hour.
 2. Roof Slabs 5 inches in thickness or less:
 - a. UL Design No. C-AJ-2093, C-AL-2140, F Rating 1 & 2 hour.
 - b. UL Design No. C-AJ-2092, F Rating 3 hour.
 3. Concrete/Masonry Walls 8 inches in thickness or less:
 - a. UL Design No. C-AJ-2093, C-AL-2140, F Rating 1 & 2 hour.
 - b. UL Design No. C-AJ-2092, F Rating 3 hour.
 4. Framed Floors:
 - a. UL Design No. F-C-2115, F-C-2129, F-C-2158, F Rating 1 & 2 hour.
 5. Framed Walls:
 - a. UL Design No. C-AJ-2021, W-L-2032, F Rating 1 & 2 hour.
- F. Firestopping at Cable Tray Penetrations: Any material meeting requirements.
 1. Concrete Floors 5 inches in thickness or less:
 - a. UL Design No. C-AJ-4003, C-AJ-4020, C-AJ-4017, F Rating 1 & 2 hour.
 - b. UL Design No. C-AJ-4003, C-AJ-4020, C-AJ-4017, F Rating 3 hour.
 2. Roof Slabs 5 inches in thickness or less:
 - a. UL Design No. C-AJ-4003, C-AJ-4020, C-AJ-4017, F Rating 1 & 2 hour.
 - b. UL Design No. C-AJ-4003, C-AJ-4020, C-AJ-4017, F Rating 3 hour.
 3. Concrete/Masonry Walls 8 inches in thickness or less:
 - a. UL Design No. C-AJ-4003, C-AJ-4020, C-AJ-4017, F Rating 1 & 2 hour.
 - b. UL Design No. C-AJ-4003, C-AJ-4020, C-AJ-4017, F Rating 3 hour.
 4. Framed Walls:
 - a. UL Design No. W-L-4004, W-L-4005, W-L-4011, F Rating 1 & 2 hour.

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- G. Firestopping at Cable Penetrations, not in Conduit or Cable Tray: Any material meeting requirements.
1. Concrete Floors 5 inches in thickness or less:
 - a. UL Design No. C-AJ-3030, C-AJ-3133, C-AJ-3072, F Rating 1 & 2 hour.
 - b. UL Design No. C-AJ-3030, C-AJ-3023, C-AJ-3072, F Rating 3 hour.
 2. Concrete Floors 5 inches in thickness or greater:
 - a. UL Design No. C-BK-3001, C-BK-3002, F Rating 1 & 2 hour.
 - b. UL Design No. C-BK-3001, C-BK-3002, F Rating 3 hour.
 3. Roof Slabs 5 inches in thickness or less:
 - a. UL Design No. C-AJ-3030, C-AJ-3133, C-AJ-3072, F Rating 1 & 2 hour.
 - b. UL Design No. C-AJ-3030, C-AJ-3023, C-AJ-3072, F Rating 3 hour.
 4. Roof Slabs 5 inches in thickness or greater:
 - a. UL Design No. C-BK-3001, C-BK-3002, F Rating 1 & 2 hour.
 - b. UL Design No. C-BK-3001, C-BK-3002, F Rating 3 hour.
 5. Concrete/Masonry Walls 8 inches in thickness or less:
 - a. UL Design No. C-AJ-3030, C-AJ-3133, C-AJ-3072, F Rating 1 & 2 hour.
 - b. UL Design No. C-AJ-3030, C-AJ-3023, C-AJ-3072, F Rating 3 hour.
 6. Concrete/Masonry Walls 8 inches in thickness or greater:
 - a. UL Design No. C-BK-3001, C-BK-3002, F Rating 1 & 2 hour.
 - b. UL Design No. C-BK-3001, C-BK-3002, F Rating 3 hour.
 7. Framed Floors:
 - a. UL Design No. F-C-3002, F-C-3045, F-C-3012, F Rating 1 & 2 hour.
 8. Framed Walls:
 - a. UL Design No. W-L-3110, W-L-3076, W-L-3065, F Rating 1 & 2 hour.
 - b. UL Design No. W-L-3139, F Rating 3 hour.
- H. Firestopping at Insulated Piping: Any material meeting requirements.
1. Concrete Floors 5 inches in thickness or less:
 - a. UL Design No. C-AJ-5001, C-AJ-5058, C-AJ-5045, F Rating 1 & 2 hour.
 - b. UL Design No. C-AJ-5001, C-AJ-5058, C-AJ-5061, F Rating 3 hour.
 2. Concrete Floors 5 inches in thickness or greater:
 - a. UL Design No. C-BK-5001, C-BK-5002, F Rating 1 & 2 hour.
 - b. UL Design No. C-BK-5001, C-BK-5002, F Rating 3 hour.
 3. Roof Slabs 5 inches in thickness or less:
 - a. UL Design No. C-AJ-5001, C-AJ-5058, C-AJ-5045, F Rating 1 & 2 hour.
 - b. UL Design No. C-AJ-5001, C-AJ-5058, C-AJ-5061, F Rating 3 hour.
 4. Roof Slabs 5 inches in thickness or greater:
 - a. UL Design No. C-BK-5001, C-BK-5002, F Rating 1 & 2 hour.
 - b. UL Design No. C-BK-5001, C-BK-5002, F Rating 3 hour.
 5. Concrete/Masonry Walls 8 inches in thickness or less:
 - a. UL Design No. C-AJ-5001, C-AJ-5058, C-AJ-5045, F Rating 1 & 2 hour.
 - b. UL Design No. C-AJ-5001, C-AJ-5058, C-AJ-5061, F Rating 3 hour.
 6. Concrete/Masonry Walls 8 inches in thickness or greater:
 - a. UL Design No. C-AJ-5001, C-AJ-5058, C-AJ-5045, F Rating 1 & 2 hour.
 - b. UL Design No. C-AJ-5001, C-AJ-5058, C-AJ-5061, F Rating 3 hour.
 7. Framed Floors:
 - a. UL Design No. F-C-5038, F-C-5055, F-C-5029, F Rating 1 & 2 hour.
 8. Framed Walls:
 - a. UL Design No. W-L-5011, W-L-5014, W-L-5029, F Rating 1 & 2 hour.
 - b. UL Design No. W-L-5101, W-L-5023, W-L-5085, F Rating 3 hour.
- I. Firestopping at Miscellaneous Electrical Penetrants such as Busducts: Any material meeting requirements.
1. Concrete Floors 5 inches in thickness or less:
 - a. UL Design No. C-AJ-6002, C-AJ-6003, C-AJ-6006, F Rating 1 & 2 hour.
 - b. UL Design No. C-AJ-6002, C-AJ-6003, C-AJ-6006, F Rating 3 hour.

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2. Roof Slabs 5 inches in thickness or less:
 - a. UL Design No. C-AJ-6002, C-AJ-6003, C-AJ-6006, F Rating 1 & 2 hour.
 - b. UL Design No. C-AJ-6002, C-AJ-6003, C-AJ-6006, F Rating 3 hour.
3. Concrete/Masonry Walls 8 inches in thickness or less:
 - a. UL Design No. C-AJ-6002, C-AJ-6003, C-AJ-6006, F Rating 1 & 2 hour.
 - b. UL Design No. C-AJ-6002, C-AJ-6003, C-AJ-6006, F Rating 3 hour.
4. Framed Walls:
 - a. UL Design No. W-L-6002, W-L-6001, W-L-6004, F Rating 1 & 2 hour.
- J. Firestopping at Miscellaneous Mechanical Penetrants such as Air Ducts: Any material meeting requirements.
 1. Concrete Floors 5 inches in thickness or less:
 - a. UL Design No. C-AJ-7013, C-AJ-7047, F Rating 1 & 2 hour.
 - b. UL Design No. C-AJ-7003, C-AJ-7046, F Rating 3 hour.
 2. Roof Slabs 5 inches in thickness or less:
 - a. UL Design No. C-AJ-7013, C-AJ-7047, F Rating 1 & 2 hour.
 - b. UL Design No. C-AJ-7003, C-AJ-7046, F Rating 3 hour.
 3. Concrete/Masonry Walls 8 inches in thickness or less:
 - a. UL Design No. C-AJ-7013, C-AJ-7047, F Rating 1 & 2 hour.
 - b. UL Design No. C-AJ-7003, C-AJ-7046, F Rating 3 hour.
 4. Framed Floors:
 - a. UL Design No. F-C-7001, F-C-7002, F-C-7013, F Rating 1 & 2 hour.
 5. Framed Walls:
 - a. UL Design No. W-L-7041, W-L-7025, W-L-7040, F Rating 1 & 2 hour.
- K. Firestopping at Groupings of penetrations including any combination of items above: Any material meeting requirements.
 1. Concrete Floors 5 inches in thickness or less:
 - a. UL Design No. C-AJ-8001, C-AJ-8016, C-AJ-8041, F Rating 1 & 2 hour.
 - b. UL Design No. C-AJ-8001, C-AJ-8016, C-AJ-8041, F Rating 3 hour.
 2. Roof Slabs 5 inches in thickness or less:
 - a. UL Design No. C-AJ-8001, C-AJ-8016, C-AJ-8041, F Rating 1 & 2 hour.
 - b. UL Design No. C-AJ-8001, C-AJ-8016, C-AJ-8041, F Rating 3 hour.
 3. Concrete/Masonry Walls 8 inches in thickness or less:
 - a. UL Design No. C-AJ-8001, C-AJ-8016, C-AJ-8041, F Rating 1 & 2 hour.
 - b. UL Design No. C-AJ-8001, C-AJ-8016, C-AJ-8041, F Rating 3 hour.
 4. Framed Walls:
 - a. UL Design No. W-L-8013, W-L-8016, F Rating 1 & 2 hour.
 - b. UL Design No. W-L-8014, W-L-8015, F Rating 3 hour.
- L. Firestopping between Edge of Floor Slab and Curtain Wall (without Penetrations): Glass fiber or mineral fiber safing insulation; UL Design No. F-C-7001, F Rating 1 hour.
- M. Temporary Firestopping: Intumescent pillows; UL Design No. C-AJ-2020, F Rating 1-1/2 hour; provide at locations indicated on drawings.

2.2 MATERIALS

- A. Manufacturers:
 1. 3M Fire Protection Products.
 2. Firestop Systems, Inc.
 3. Hilti Construction Chemicals, Inc.
 4. Isolatek International.
 5. Johns Mansville International, Inc.
 6. Specified Technologies, Inc.
 7. Tremco.
 8. Substitutions: See Section 01600 - Product Requirements.
- B. Elastomeric Silicone Firestopping: Single component silicone elastomeric compound and compatible silicone sealant. Type required for tested assembly design.
 1. Color: Dark grey.

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FIRESTOPPING

- C. Fibered Compound Firestopping: Formulated compound mixed with incombustible non-asbestos fibers. Type required for tested assembly design.
 - 1. Color: Dark grey.
- D. Fiber Packing Material: Mineral fiber packing insulation. Type required for tested assembly design.
- E. Foil Tape: Nominal 3 mil. thick pressure sensitive aluminum foil tape. Type required for tested assembly design.
- F. Firestop Devices: Mechanical device with incombustible filler and galvanized steel jacket, collar, and flanged stops. Type required for tested assembly design.
- G. Intumescent Composite Sheet: Rigid panels consisting of aluminum-foil-faced elastomeric sheet bonded to galvanized steel sheet. Type required for tested assembly design.
- H. Hangers: Minimum 1 inch wide strips of minimum 0.034 inch (20 gauge) galvanized steel sheet. Type required for tested assembly design.
- I. Fire Spray: Sprayable, flexible, water-based coating that is water-resistant. Type required for tested assembly design.
- J. Caulks: Single component, water-based, non-flammable, paintable coating with non-sag and low shrinkage characteristics. Type required for tested assembly design.
- K. Mortars: Prepackaged, dry mixes consisting of a blend of inorganic binders, hydraulic cement, fillers, and lightweight aggregate formulated for mixing with water at Project site to form a nonshrinking, homogeneous mortar. Type required for tested assembly design.
- L. Primers, Sleeves, Forms, and Accessories: Type required for tested assembly design.

PART 3 – EXECUTION

3.1 EXAMINATION

- A. Verify openings are ready to receive the work of this section.

3.2 PREPARATION

- A. Clean substrate surfaces of dirt, dust, grease, oil, loose material, or other matter which may affect bond of firestopping material.
- B. Remove incompatible materials which may affect bond.
- C. Priming: Prime substrates where recommended in writing by through-penetration firestop system manufacturer using that manufacturer's recommended products and methods. Confine primers to areas of bond; do not allow spillage and migration onto exposed surfaces.

3.3 INSTALLATION

- A. Install materials in manner described in fire test report and in accordance with manufacturer's instructions, completely closing openings.

3.4 CLEANING AND PROTECTION

- A. Clean adjacent surfaces of firestopping materials.
- B. Protect adjacent surfaces from damage by material installation.

END OF SECTION

SECTION 07900

JOINT SEALERS

PART 1 – GENERAL

1.1 SECTION INCLUDES

- A. Sealants and joint backing.

1.2 RELATED SECTIONS

- A. Section 08800 – Glazing: Glazing sealants and accessories.
- B. Section 09260 – Gypsum Board Assemblies: Acoustic Sealant.

1.3 REFERENCES

- A. ASTM C 834 - Standard Specification for Latex Sealants; 2000.
- B. ASTM C 919 - Standard Practice for Use of Sealants in Acoustical Applications; 2002.
- C. ASTM C 920 - Standard Specification for Elastomeric Joint Sealants; 2002.
- D. ASTM C 1193 - Standard Guide for Use of Joint Sealants; 2000.
- E. ASTM D 1667 - Standard Specification for Flexible Cellular Materials--Vinyl Chloride Polymers and Copolymers (Closed-Cell Foam); 1997.

1.4 SUBMITTALS

- A. See Section 01300 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide data indicating sealant chemical characteristics, performance criteria, substrate preparation, limitations, and color availability.

1.5 QUALITY ASSURANCE

- A. Applicator Qualifications: Company specializing in performing the work of this section with minimum 3 years experience and approved by manufacturer.

1.6 ENVIRONMENTAL REQUIREMENTS

- A. Maintain temperature and humidity recommended by the sealant manufacturer during and after installation.

1.7 WARRANTY

- A. See section 01780 – Closeout Submittals, for additional warranty requirements.
- B. Correct defective work within a five year period after the Date of Substantial Completion.
- C. Warranty: Include coverage for installed sealants and accessories which fail to achieve airtight seal, exhibit loss of adhesion or cohesion, or do not cure.

PART 2 – PRODUCTS

2.1 MANUFACTURERS

- A. Silicone Sealants:
 - 1. Bostik Findley; www.bostikfindley-us.com.
 - 2. GE Plastics; www.geplastics.com.
 - 3. Pecora Corporation; www.pecora.com.
 - 4. Sonneborn, ChemRex, Inc; www.chemrex.com.
 - 5. Dow Corning; www.dowcorning.com
 - 6. Tremco, Inc; www.tremcosealants.com.
 - 7. Substitutions: See Section 01600 - Product Requirements.
- B. Polyurethane Sealants:
 - 1. Bostik Findley; www.bostikfindley-us.com.
 - 2. Pecora Corporation; www.pecora.com.
 - 3. Sonneborn, ChemRex, Inc; www.chemrex.com.
 - 4. Tremco, Inc; www.tremcosealants.com.
 - 5. Substitutions: See Section 01600 - Product Requirements.

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JOINT SEALERS

- C. Butyl Sealants:
 - 1. Bostik Findley; www.bostikfindley-us.com.
 - 2. Pecora Corporation: www.pecora.com.
 - 3. TEC Specialty Products Inc.
 - 4. Tremco, Inc: www.tremcosealants.com.
 - 5. Substitutions: See Section 01600 - Product Requirements.
- D. Preformed Compressible Foam Sealers:
 - 1. Emseal Joint Systems, Ltd: www.emseal.com.
 - 2. Sandell Manufacturing Company, Inc: www.sandellmfg.com.
 - 3. Polytite Manufacturing Corporation: www.polytite.com.
 - 4. Substitutions: See Section 01600 - Product Requirements.

2.2 SEALANTS

- A. Type S1 - General Purpose Exterior Sealant: Polyurethane; ASTM C 920, Grade NS, Class 25, Uses M, G, and A; single component.
 - 1. Color: As selected by Architect from Manufacturer's full line of colors.
 - 2. Applications:
 - a. Control, expansion and soft joints in masonry.
 - b. Joints between concrete and other materials.
 - c. Joints between metal frames and other materials.
 - d. Other exterior joints for which no other sealant is indicated.
- B. Type S2 - General Purpose Interior Sealant: Acrylic emulsion latex; ASTM C 834, Type OP, Grade NF single component, paintable.
 - 1. Color: As selected by Architect from Manufacturer's full line of colors.
 - 2. Applications:
 - a. Interior wall and ceiling control joints.
 - b. Joints between door and window frames and wall surfaces.
 - c. Other interior joints for which no other sealant is indicated.
- C. Type S3 - Acoustical Sealant: Butyl or acrylic sealant; ASTM C 920, Grade NS, Class 12-1/2, Uses M and A; single component, solvent release curing, non-skinning.
 - 1. Color: N/A.
 - 2. Applications:
 - a. For concealed locations only.
 - b. Sealant bead between top stud runner and structure; and between bottom stud track and floor.
- D. Type S4 - Interior Floor Joint Sealant: Polyurethane, self-leveling; ASTM C 920, Grade P, Class 25, Uses T, M and A; single component.
 - 1. Color: As selected by Architect from Manufacturer's full line of colors.
 - 2. Applications:
 - a. Approved by manufacturer for wide joints up to 1-1/2 inches.
 - b. Expansion joints in floors.
- E. Type S5 - Concrete Paving Joint Sealant: Polyurethane, self-leveling; ASTM C 920, Class 25, Uses T, I, M and A; single component.
 - 1. Color: As selected by Architect from Manufacturer's full line of colors.
 - 2. Applications:
 - a. Joints in sidewalks and vehicular paving.
 - b. Compressible filler joints adjacent to foundations.

2.3 ACCESSORIES

- A. Primer: Non-staining type, recommended by sealant manufacturer to suit application.
- B. Joint Cleaner: Non-corrosive and non-staining type, recommended by sealant manufacturer; compatible with joint forming materials.
- C. Joint Backing: Round foam rod compatible with sealant; ASTM D 1667, closed cell PVC; oversized 30 to 50 percent larger than joint width.

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JOINT SEALERS

- D. Bond Breaker: Pressure sensitive tape recommended by sealant manufacturer to suit application.

PART 3 – EXECUTION

3.1 EXAMINATION

- A. Verify that substrate surfaces are ready to receive work.
- B. Verify that joint backing and release tapes are compatible with sealant.

3.2 PREPARATION

- A. Remove loose materials and foreign matter which might impair adhesion of sealant.
- B. Clean and prime joints in accordance with manufacturer's instructions.
- C. Perform preparation in accordance with manufacturer's instructions and ASTM C 1193.
- D. Protect elements surrounding the work of this section from damage or disfigurement.

3.3 INSTALLATION

- A. Perform work in accordance with sealant manufacturer's requirements for preparation of surfaces and material installation instructions.
- B. Perform installation in accordance with ASTM C 1193.
- C. Perform acoustical sealant application work in accordance with ASTM C 919.
- D. Measure joint dimensions and size joint backers to achieve width-to-depth ratio, neck dimension, and surface bond area as recommended by manufacturer, except where specific dimensions are indicated.
- E. Install bond breaker where joint backing is not used.
- F. Install sealant free of air pockets, foreign embedded matter, ridges, and sags.
- G. Apply sealant within recommended application temperature ranges. Consult manufacturer when sealant cannot be applied within these temperature ranges.
- H. Tool joints concave.

3.4 CLEANING

- A. Clean adjacent soiled surfaces.

3.5 PROTECTION OF FINISHED WORK

- A. Protect sealants until cured.

3.6 SCHEDULE

- A. Exterior Joints for Which No Other Sealant Type is Indicated: Type S1; colors as selected.
- B. Control and Expansion Joints in Paving: Type S5.
- C. Exterior Wall Expansion Joints: Type S1.
- D. Joints Between Exterior Metal Frames and Adjacent Work (except masonry): Type S1.
- E. Interior Joints for Which No Other Sealant is Indicated: Type S2.
- F. Control and Expansion Joints in Interior Concrete Slabs and Floors: Type S4.
- G. In STC-Rated Walls, Between Metal Stud Track/Runner and Adjacent Construction: Type S3.
- H. Joints Between Plumbing Fixtures and Walls and Floors, and Between Countertops and Walls: Type S2.

END OF SECTION

SECTION 08110

STEEL DOORS AND FRAMES

PART 1 – GENERAL

1.1 SECTION INCLUDES

- A. Non-fire-rated steel doors and frames.
- B. Steel frames for wood doors.
- C. Fire-rated steel doors and frames.
- D. Thermally insulated steel doors.
- E. Steel glazing frames.

1.2 RELATED SECTIONS

- A. Section 08211 - Flush Wood Doors.
- B. Section 08710 - Door Hardware.
- C. Section 08800 - Glazing: Glass for doors and borrowed lites.
- D. Section 09900 - Paints and Coatings: Field painting.

1.3 REFERENCES

- A. ANSI/ICC A117.1 - American National Standard for Accessible and Usable Buildings and Facilities; International Code Council; 1998.
- B. ANSI A250.8 - SDI-100 Recommended Specifications for Standard Steel Doors and Frames; 1998.
- C. ANSI A250.10 - Test Procedure and Acceptance Criteria for Prime Painted Steel Surfaces for Steel Doors and Frames; 1998.
- D. ASTM A 653/A 653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2002a.
- E. ASTM C 1363 - Standard Test Method for Thermal Performance of Building Assemblies by Means of a Hot Box Apparatus; 1997.
- F. NAAMM HMMA 840 - Installation and Storage of Hollow Metal Doors and Frames; The National Association of Architectural Metal Manufacturers; 1999.
- G. NAAMM HMMA 860 - Guide Specifications for Hollow Metal Doors and Frames; The National Association of Architectural Metal Manufacturers; 1992.
- H. NAAMM HMMA 861 - Guide Specifications for Commercial Hollow Metal Doors and Frames; The National Association of Architectural Metal Manufacturers; 2000.
- I. NFPA 80 - Standard for Fire Doors and Fire Windows; National Fire Protection Association; 1999.
- J. NFPA 252 - Standard Methods of Fire Tests of Door Assemblies; National Fire Protection Association; 1999.
- K. UL (BMD) - Building Materials Directory; Underwriters Laboratories Inc.; current edition.

1.4 SUBMITTALS

- A. See Section 01300 - Administrative Requirements for submittal procedures.
- B. Product Data: Materials and details of design and construction, hardware locations, reinforcement type and locations, anchorage and fastening methods, and finishes; and one copy of referenced grade standard.
- C. Shop Drawings: Details of each opening, showing elevations, glazing, frame profiles, and identifying location of different finishes, if any.
- D. Manufacturer's Certificate: Certification that products meet or exceed specified requirements.

1.5 QUALITY ASSURANCE

- A. Manufacturer: Company specializing in manufacturing the products specified in this section with minimum Five years documented experience.
- B. Maintain at the project site a copy of all reference standards dealing with installation.

1.6 DELIVERY, STORAGE, AND PROTECTION

- A. Store in accordance with NAAMM HMMA 840.
- B. Protect with resilient packaging; avoid humidity build-up under coverings; prevent corrosion.

SECTION 08110

STEEL DOORS AND FRAMES

PART 2 – PRODUCTS

2.1 MANUFACTURERS

- A. Steel Doors and Frames:
 - 1. Ceco Door Products; www.cecodoor.com.
 - 2. Curries; www.curries.com.
 - 3. Kewanee Corp., Kewanee, IL.
 - 4. LaForce Inc.; www.laforceinc.com.
 - 5. Republic Builders Products; www.republicdoor.com.
 - 6. Steelcraft Manufacturing Co; www.steelcraft.com.
 - 7. Trussbilt; www.trussbilt.com.
 - 8. Substitutions: See Section 01600 - Product Requirements.

2.2 DOORS AND FRAMES

- A. Requirements for All Doors and Frames:
 - 1. Door Top Closures: Flush with top of faces and edges.
 - 2. Door Edge Profile: Beveled on both edges.
 - 3. Door Texture: Smooth faces.
 - 4. Glazed Lights: Non-removable stops on non-secure side; sizes and configurations as indicated on drawings.
 - 5. Hardware Preparation: In accordance with DHI A115 Series, with reinforcement welded in place, in addition to other requirements specified in door grade standard.
 - 6. Galvanizing for Units in Wet Areas: All components hot-dipped zinc-iron alloy-coated (galvannealed), Manufacturer's standard coating thickness.
 - 7. Finish: Factory primed, for field finishing.
- B. Combined Requirements: If a particular door and frame unit is indicated to comply with more than one type of requirement, comply with all the specified requirements for each type; for instance, an exterior door that is also indicated as being sound-rated must comply with the requirements specified for exterior doors and for sound-rated doors; where two requirements conflict, comply with the most stringent.

2.3 STEEL DOORS

- A. Exterior Doors:
 - 1. Grade: NAAMM HMMA 861, physical performance Level A.
 - a. Minimum Hardware Reinforcing:
 - 1) Butts: #7 gauge steel.
 - 2) Locks: #12 gauge steel.
 - 3) Surface Applied Hardware: #12 gauge steel.
 - 2. Core: Foamed in place polyurethane.
 - 3. Top Closures for Out swinging Doors: Flush with top of faces and edges.
 - 4. Texture: Smooth faces.
 - 5. Finish: Factory primed, for field finishing.
 - 6. Galvanizing: All components hot-dipped zinc-iron alloy-coated (galvannealed) in accordance with ASTM A 653/A 653M, with manufacturer's standard coating thickness.
 - 7. Weatherstripping: See Section 08710 - Hardware
- B. Interior Doors, Non-Fire-Rated:
 - 1. Grade: NAAMM HMMA 860, physical performance Level A.
 - a. Minimum Hardware Reinforcing: Same as specified for exterior doors.
 - 2. Core: Mineral rock wool, 6 lb. density or fiberglass.
 - 3. Thickness: 1-3/4 inches.
 - 4. Texture: Smooth faces.
 - 5. Finish: Factory primed, for field finishing.
 - 6. Minimum Reinforcing Size:
 - a. Butts and Pivots: Full interior width at door by 10-inches long.
 - b. Closers: Inverted channel, 6-inch sides by 18 inches long.

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STEEL DOORS AND FRAMES

- c. Other Surface Applied Hardware: To template.
- d. Locks: To template.
- C. Drilling and tapping for surface applied hardware shall be done in the field.
- D. Provide hardware reinforcing for closers on all doors.
- E. Interior Doors, Fire-Rated:
 - 1. Grade: NAAMM HMMA 861, physical performance Level A.
 - 2. Fire Rating: As indicated on Door and Frame Schedule, with temperature rise ratings as required by code, tested in accordance with NFPA 252.
 - a. Provide units listed and labeled by UL.
 - b. Attach fire rating label to each fire rated unit.
 - 3. Minimum Hardware Reinforcing: Same as specified for interior non-fire rated doors.
 - 4. Texture: Smooth faces.
 - 5. Finish: Factory primed, for field finishing.

2.4 STEEL DOORS FOR SEVERE STORM SHELTERS

- A. Manufacturers Basis of Design:
 - a. Steelcraft – PW14 Series
- B. General: Provide complete tornado resistant door and frame shelter assemblies constructed to resist the design wind pressures for components and cladding and missile impact loads as described in ICC 500 - 2014, ICC/NSSA Standard for the Design and Construction of Storm Shelters. Only single opening and paired opening doors and their frames constructed to resist calculated design wind pressures and laboratory tested missile impacts are acceptable.
 - 1. Door systems, both single doors and paired openings, tested and complying with ICC 500 - 2014 and FEMA P-361 (2015), Design and Construction Guidance for Community Safe Rooms and supported by third party test results.
 - 2. Sheets fabricated on exterior openings from commercial quality hot dipped zinc coated steel complying with ASTM A924 A60. Gauges to be in accordance with manufacturers tested assemblies.
 - 3. Vertical Edges: Vertical edges to have the face sheets joined by a continuous weld extending the full height of the door. Welds are to be ground, filled and dressed smooth. Beveled Lock Edge, 1/8 inch in 2 inches (3 mm in 50 mm).
 - 4. Top Edge: Reinforce top of doors with a continuous steel channel extending the full width of the door and welded to the face sheet. Doors with an inverted top channel to include a steel closure channel, screw attached and welded in place with the web of the channel flush with the face sheets of the door. Plastic or composite channel fillers are not acceptable.
 - 5. Hinge Reinforcement: Minimum 7 gauge (3/16") plate 1-1/4" x 9".

2.5 STEEL FRAMES

- A. General: Provide fully welded frames.
 - 1. Comply with the requirements of grade specified for corresponding door, except:
 - a. Provide 16 gage frames, except provide #14 gauge galvanized for exterior doors.
 - 2. Hardware Reinforcing:
 - a. Butts and Pivots: 1/4-inch thick.
 - b. Locks: # 12 gauge.
 - c. Surface Applied Hardware: #12 gauge.
 - d. Dust Covers: #20 gauge.
 - 3. Frame Anchors: #14 gauge, corrugated "T" anchors.
 - a. Frames for Wood Doors: Comply with frame requirements specified in ANSI A250.8 for Level 1, 16 gauge
 - 4. Minimum Reinforcing Size:
 - a. Butts and Pivots: Full width of frame by 10-inches long.
 - b. Closers: Full width of frame by 18-inches long.
 - c. Locks: As required by template.
 - d. Other Surface Applied Hardware: As required by template.

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5. Finish: Factory primed, for field finishing.
 - a. Frame installer shall coat the interior portion of all exterior frames with a bituminous coating after factory priming and prior to installation (both jambs).
6. Provide mortar guard boxes for hardware cut-outs in frames to be installed in masonry or to be grouted.
7. Frames in Masonry Walls: Size to suit masonry coursing with head member 4 inches high to fill opening without cutting masonry units.
8. Frames Wider than 48 Inches: Reinforce with steel channel fitted tightly into frame head, flush with top.
9. Exterior Door Frames: Fully welded.
 - a. Galvanizing: All components hot-dipped zinc-iron alloy-coated (galvannealed) in accordance with ASTM A 653/A 653M, with manufacturer's standard coating thickness.
 - b. Weatherstripping: See Section 08710 - Hardware
10. Interior Door Frames, Non-Fire-Rated: Fully welded type.
11. Interior Door Frames, Fire-Rated: Fully welded type.
 - a. Fire Rating: Same as door, labeled.
- B. Mullions for Pairs of Doors: Fixed, of profile similar to jambs.
- C. Frames for Interior Glazing or Borrowed Lights: Construction and face dimensions to match door frames, and as indicated on drawings.
- D. Transom Bars: Fixed, of profile same as jamb and head.

2.6 FRAMES FOR SEVERE STORM SHELTERS

- A. General: Subject to the same compliance standards and requirements as standard hollow metal frames, provide complete tornado or hurricane resistant door and frame assemblies, for both single doors and paired openings, tested and labeled as complying with ICC 500 - 2014 and FEMA P-361 (2015) and supported by third party test results.
 1. Fabricate exterior frames from 14 gauge hot dipped zinc coated steel that complying with ASTM designations A924 A60.
 2. Manufacturers Basis of Design:
 - a. Steelcraft – 320/361

2.7 ACCESSORY MATERIALS

- A. Louvers: Roll formed steel with overlapping frame; factory-painted finish, color as selected; factory-installed.
 1. In Fire-Rated Doors: UL-listed and labeled fusible link and closing device, same rating as door.
 2. Style: Vision proof inverted V or inverted Y.
- B. Glazing: As specified in Section 08800.
- C. Removable Stops: Formed sheet steel, shape as indicated on drawings, mitered or butted corners; prepared for countersink style tamper proof screws.
- D. Bitumastic coating for interior side of steel frames:
 1. Installing contractor applied, ultra-high build, single-component coat tar for protecting steel substrates subject to aggressive conditions and below grade requirements complying with MIL-C-18480-B and Bureau of Reclamation CA50 specifications. Apply wet to 18.0 mils (450 microns) in one or two coats. Total dry film thickness of not less than 12 mils (300 microns) or in excess of 30 mils.
 2. Frame installation contractor to provide bitumastic coating for all exterior door frames for frame prior to frame installation.
- E. Grout for Frames: Portland cement grout of maximum 4-inch slump for hand troweling; thinner pumpable grout is prohibited unless approved in writing by Architect for areas only inaccessible to troweling during installation.
- F. Silencers: Resilient rubber, fitted into drilled hole; 3 on strike side of single door, 3 on center mullion of pairs, and 2 on head of pairs without center mullions.
- G. Temporary Frame Spreaders: Provide for all factory- or shop-assembled frames.

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STEEL DOORS AND FRAMES

2.8 FINISH MATERIALS

- A. Primer: Rust-inhibiting, complying with ANSI A250.10, door manufacturer's standard.
- B. Bituminous Coating: Asphalt emulsion or other high-build, water-resistant, resilient coating.

PART 3 – EXECUTION

3.1 EXAMINATION

- A. Verify existing conditions before starting work.
- B. Verify that opening sizes and tolerances are acceptable.

3.2 PREPARATION

- A. Frame installing contractor shall coat inside of frames to be installed in masonry or to be grouted, with bituminous coating prior to installation as noted. Apply wet to 18.0 mils (450 microns) in one or two coats. Total dry film thickness of not less than 12 mils (300 microns) or in excess of 30 mils.

3.3 INSTALLATION

- A. Install in accordance with the requirements of the specified door grade standard and NAAMM HMMA 840.
- B. In addition, install fire rated units in accordance with NFPA 80.
- C. Coordinate frame anchor placement with wall construction.
- D. Grout frames in solid masonry construction; brace frames so that pressure of grout before setting will not deform frames.
- E. Coordinate installation of hardware.
- F. Coordinate installation of glazing.
- G. Whenever possible, leave frame spreaders intact until frames and masonry are set perfectly square and plumb and all anchors are securely attached. Grout all frames solid.
- H. Coordinate installation of electrical connections to electrical hardware or security devices.
- I. Grind, bondo, sand, prime and paint over grout holes, anchor heads and any imperfections in frame.
- J. Touch up damaged factory finishes.

3.4 ERECTION TOLERANCES

- A. Clearances between Door and Frame: As specified in ANSI A250.8.
- B. Maximum Diagonal Distortion: 1/16 in measured with straight edge, corner to corner.
- C. Do not erect members which are observed to be warped, bowed, deformed, or otherwise damaged or defaced to such an extent as to impair strength or appearance. Remove and replace members which have been damaged in the process of erection.

3.5 ADJUSTING

- A. Adjust for smooth and balanced door movement.

3.6 SCHEDULE

- A. Refer to Door and Frame Schedule on the drawings.

END OF SECTION

SECTION 08211

FLUSH WOOD DOORS

PART 1 – GENERAL

1.1 SECTION INCLUDES

- A. Flush wood doors; flush configuration; fire rated and non-rated.

1.2 RELATED SECTIONS

- A. Section 08710 - Door Hardware.
- B. Section 08800 - Glazing.

1.3 REFERENCES

- A. AWI (QSI) - Architectural Woodwork Quality Standards Illustrated; Architectural Woodwork Institute; 1997, Seventh Edition, Version 1.0.
- B. NFPA 80 - Standard for Fire Doors and Fire Windows; National Fire Protection Association; 1999.
- C. UL (BMD) - Building Materials Directory; Underwriters Laboratories Inc.; current edition.
- D. UL 10C - Standard for Positive Pressure Fire Tests of Door Assemblies; 1998.

1.4 SUBMITTALS

- A. See Section 01300 - Administrative Requirements for submittal procedures.
- B. Product Data: Indicate door core materials and construction; veneer species, type and characteristics.
- C. Shop Drawings: Illustrate door opening criteria, elevations, sizes, types, swings, undercuts required, special beveling, special blocking for hardware, factory machining criteria, factory finishing criteria, identify cutouts for glazing.

1.5 QUALITY ASSURANCE – NOT USED

1.6 REGULATORY REQUIREMENTS

- A. Installed Fire Rated Door and Transom Panel Assembly: Conform to NFPA 80 for fire rated class as indicated.

1.7 DELIVERY, STORAGE, AND PROTECTION

- A. Package, deliver and store doors in accordance with specified quality standard.
- B. Accept doors on site in manufacturer's packaging. Inspect for damage.
- C. Protect doors with resilient packaging sealed with heat shrunk plastic. Do not store in damp or wet areas; or in areas where sunlight might bleach veneer. Seal top and bottom edges with tinted sealer if stored more than one week. Break seal on site to permit ventilation.

1.8 PROJECT CONDITIONS

- A. Coordinate the work with door opening construction, door frame and door hardware installation.

1.9 WARRANTY

- A. See Section 01780 - Closeout Submittals for additional warranty requirements.
- B. Provide warranty for the following term:
- C. Include coverage for delamination of veneer, warping beyond specified installation tolerances, defective materials and telegraphing core construction.

SECTION 08211

FLUSH WOOD DOORS

PART 2 – PRODUCTS

2.1 MANUFACTURERS

- A. Veneer Doors:
 - 1. Basis of Design: V.T. Industries, Holstein, IA
 - 2. Substitutions: See Section 01600 - Product Requirements.

2.2 DOORS AND PANELS

- A. All Doors: See drawings for locations and additional requirements.
- B. Interior Doors: 1-3/4 inches thick unless otherwise indicated; flush construction.
 - 1. Provide solid core doors at all locations unless otherwise noted.
 - 2. Fire Rated Doors: Tested to ratings indicated on drawings in accordance with UL 10C or UBC Standard 7-2-97 ("positive pressure"); UL labeled.

2.3 DOOR AND PANEL CORES

- A. Non-Rated Solid Core and 20 Minute Rated Doors: AWI Architectural Woodwork Quality Standards Illustrated, Section 1300, Type PC - Particleboard; Grade 1-LD-1.
- B. Fire Rated Doors: Mineral core, Type FD, plies and faces as indicated above.

2.4 DOOR FACINGS

- A. Wood Veneer Facing for Transparent Finish: Red Oak, veneer grade as specified by quality standard, plain sliced, book veneer match, running assembly match; unless otherwise indicated.
 - 1. Vertical Edges: Same species as face veneer.
- B. Interior Doors - Veneer: red oak species, veneer grade as specified by door quality standard, plain sliced, with slip matched grain, for transparent finish.
- C. Facing Adhesive: Type I - waterproof.
- D. Color: Clear, CL 18

2.5 ACCESSORIES

- A. Glazing Stops: Provide window stops by National Guardian – Product #L-FRA100. Color to be selected from manufacturer's full color line. Provide Fire Rated product at fire rated doors.

2.6 DOOR CONSTRUCTION

- A. Fabricate doors in accordance with door quality standard specified.
- B. Fabricate fire rated doors in accordance with UL requirements. Attach fire rating label to door.
- C. Meeting Options for (Non-Rated) Double Doors: No Bevel
- D. Provide solid blocks at lock edge for hardware reinforcement.
 - 1. Provide solid blocking for other through bolted hardware.
- E. Vertical Exposed Edge of Stiles - Veneer Faces: Of same species as veneer facing.
- F. Fit door edge trim to edge of stiles after applying veneer facing.
- G. Bond edge banding to cores.
- H. Transom Meeting Edge Options: Non-Rabbeted
- I. Provide edge clearances in accordance with AWI Quality Standards Illustrated Section 1700.

2.7 FACTORY FINISHING

- A. Factory finish doors in accordance with AWI Quality Standards Illustrated, Section 1500 to the following finish designations:
 - 1. Transparent Finish: TR-6, transparent catalyzed polyurethane, Custom quality, Semi-Gloss sheen.

SECTION 08211

FLUSH WOOD DOORS

PART 3 – EXECUTION

3.1 EXAMINATION

- A. Verify existing conditions before starting work.
- B. Verify that opening sizes and tolerances are acceptable.
- C. Do not install doors in frame openings that are not plumb or are out-of-tolerance for size or alignment.

3.2 INSTALLATION

- A. Install doors in accordance with manufacturer's instructions and specified quality standard.
 - 1. Install fire-rated doors in accordance with NFPA 80, Warnock Hersey, and UL requirements.
- B. Trim non-rated door width by cutting equally on both jamb edges.
- C. Trim door height by cutting bottom edges to a maximum of 3/4 inch (19 mm).
- D. Use machine tools to cut or drill for hardware.
- E. Pilot drill screw and bolt holes.
- F. Coordinate installation of doors with installation of frames and hardware.
- G. Coordinate installation of glazing.

3.3 INSTALLATION TOLERANCES

- A. Conform to specified quality standard for fit and clearance tolerances.
- B. Conform to specified quality standard for maximum diagonal distortion.

3.4 ADJUSTING

- A. Adjust doors for smooth and balanced door movement.
- B. Adjust closers for full closure.

3.5 SCHEDULE – Refer to Drawings

END OF SECTION

SECTION 08255

FRP FLUSH DOOR SYSTEMS

PART 1 – GENERAL

1.1 SECTION INCLUDES

- A. Fiberglass reinforced polyester (FRP) flush doors with aluminum frames.

1.2 RELATED SECTIONS

- A. Section 08710 - Door Hardware.

1.3 REFERENCES

- A. AAMA 1503-98 - Thermal Transmittance and Condensation Resistance of Windows, Doors and Glazed Wall Sections.
- B. ANSI A250.4 - Test Procedure and Acceptance Criteria for Physical Endurance for Steel Doors and Hardware Reinforcings.
- C. ASTM B 117 - Operating Salt Spray (Fog) Apparatus.
- D. ASTM B 209 - Aluminum and Aluminum-Alloy Sheet and Plate.
- E. ASTM B 221 - Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes.
- F. ASTM D 256 - Determining the Pendulum Impact Resistance of Notched Specimens of Plastics.
- G. ASTM D 543 - Evaluating the Resistance of Plastics to Chemical Reagents.
- H. ASTM D 570 - Water Absorption of Plastics.
- I. ASTM D 638 - Tensile Properties of Plastics.
- J. ASTM D 790 - Flexural Properties of Unreinforced and Reinforced Plastics and Electrical Insulating Materials.
- K. ASTM D 1308 - Effect of Household Chemicals on Clear and Pigmented Organic Finishes
- L. ASTM D 1621 - Compressive Properties of Rigid Cellular Plastics.
- M. ASTM D 1623 - Tensile and Tensile Adhesion Properties of Rigid Cellular Plastics.
- N. ASTM D 2126 - Response of Rigid Cellular Plastics to Thermal and Humid Aging.
- O. ASTM D 2583 - Indentation Hardness of Rigid Plastics by Means of a Barcol Impressor.
- P. ASTM D 5420 – Impact Resistance of Flat Rigid Plastic Specimens by Means of a Falling Weight.
- Q. ASTM D 6670-01 - Standard Practice for Full-Scale Chamber Determination of Volatile Organic Emissions from Indoor Materials/Products.
- R. ASTM E 84 - Surface Burning Characteristics of Building Materials.
- S. ASTM E 90 - Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions.
- T. ASTM E 283 - Determining the Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen.
- U. ASTM E 330 - Structural Performance of Exterior Windows, Curtain Walls, and Doors by Uniform Static Air Pressure Difference.
- V. ASTM E 331 - Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Uniform Static Air Pressure Difference.
- W. ASTM F 476 - Security of Swinging Door Assemblies.
- X. ASTM F 1642-04 – Standard Test Method for Glazing Systems Subject to Air blast Loading
- Y. NWWDA T.M. 7-90 – Cycle Slam Test Method
- Z. SFBC PA 201 - Impact Test Procedures.
- AA. SFBC PA 203 - Criteria for Testing Products Subject to Cyclic Wind Pressure Loading.
- BB. SFBC 3603.2 (b)(5) - Forced Entry Resistance Test.

1.4 PERFORMANCE REQUIREMENTS

- A. General: Provide door assemblies that have been designed and fabricated to comply with specified performance requirements, as demonstrated by testing manufacturer's corresponding standard systems.
- B. Air Infiltration: For a single door 3'-0" x 7'-0", test specimen shall be tested in accordance with ASTM E 283 at pressure differential of 6.24 psf. Door shall not exceed 0.90 cfm per linear foot of perimeter crack.
- C. Water Resistance: For a single door 3'-0" x 7'-0", test specimen shall be tested in accordance with ASTM E 331 at pressure differential of 7.50 psf. Door shall not have water leakage.

SECTION 08255

FRP FLUSH DOOR SYSTEMS

- D. Swinging Door Cycle Test, Doors and Frames, ANSI A250.4: Minimum of 25,000,000 cycles.
- E. Cycle Slam Test Method, NWWDA T.M. 7-90: Minimum 5,000,000 Cycles.
- F. Sound Transmission, Exterior Doors, STC, ASTM E 90: Minimum of 25.
- G. Thermal Transmission, Exterior Doors, U-Value, AAMA 1503-98: Maximum of 0.29 BTU/hr x sf x degrees F. Minimum of 55 CRF value.
- H. Surface Burning Characteristics, FRP Doors and Panels, ASTM E 84:
 - 1. Flame Spread: Maximum of 200, Class C.
 - 2. Smoke Developed: Maximum of 450, Class C.
- I. Surface Burning Characteristics, Class A Option On Interior Faces of FRP Exterior Panels and Both Faces of FRP Interior Panels, ASTM E 84:
 - 1. Flame Spread: Maximum of 25.
 - 2. Smoke Developed: Maximum of 450.
- J. Impact Strength, FRP Doors and Panels, Nominal Value, ASTM D 256: 15.0 foot-pounds per inch of notch.
- K. Tensile Strength, FRP Doors and Panels, Nominal Value, ASTM D 638: 14,000 psi.
- L. Flexural Strength, FRP Doors and Panels, Nominal Value, ASTM D 790: 21,000 psi.
- M. Water Absorption, FRP Doors and Panels, Nominal Value, ASTM D 570: 0.20 percent after 24 hours.
- N. Indentation Hardness, FRP Doors and Panels, Nominal Value, ASTM D 2583: 55.
- O. Gardner Impact Strength, FRP Doors and Panels, Nominal Value, ASTM D 5420: 120 in-lb.
- P. Abrasion Resistance, Face Sheet, Taber Abrasion Test, 25 Cycles at 1,000 Gram Weight with CS-17 Wheel: Maximum of 0.029 average weight loss percentage.
- Q. Stain Resistance, ASTM D 1308: Face sheet unaffected after exposure to red cabbage, tea, and tomato acid. Stain removed easily with mild abrasive or FRP cleaner when exposed to crayon and crankcase oil.
- R. Chemical Resistance, ASTM D 543. Excellent rating.
 - 1. Acetic acid, Concentrated.
 - 2. Ammonium Hydroxide, Concentrated.
 - 3. Citric Acid, 10%.
 - 4. Formaldehyde.
 - 5. Hydrochloric Acid, 10%
 - 6. Sodium hypochlorite, 4 to 6 percent solution.
- S. Compressive Strength, Foam Core, Nominal Value, ASTM D 1621: 79.9 psi.
- T. Compressive Modulus, Foam Core, Nominal Value, ASTM D 1621: 370 psi
- U. Tensile Adhesion, Foam Core, Nominal Value, ASTM D 1623: 45.3 psi
- V. Thermal and Humid Aging, Foam Core, Nominal Value, 158 Degrees F and 100 Percent Humidity for 14 Days, ASTM D 2126: Minus 5.14 percent volume change.

1.5 SUBMITTALS

- A. Product Data: Submit manufacturer's product data, including description of materials, components, fabrication, finishes, and installation.
- B. Shop Drawings: Submit manufacturer's shop drawings, including elevations, sections, and details, indicating dimensions, tolerances, materials, fabrication, doors, panels, framing, hardware schedule, and finish.
- C. Samples:
 - 1. Door: Submit manufacturer's sample of door showing face sheets, core, framing, and finish.
 - 2. Color: Submit manufacturer's samples of standard colors of doors and frames.
- D. Test Reports: Submit certified test reports from qualified independent testing agency indicating doors comply with specified performance requirements.
- E. Manufacturer's Project References: Submit list of successfully completed projects including project name and location, name of architect, and type and quantity of doors manufactured.
- F. Maintenance Manual: Submit manufacturer's maintenance and cleaning instructions for doors, including maintenance and operating instructions for hardware.
- G. Warranty: Submit manufacturer's standard warranty.

SECTION 08255

FRP FLUSH DOOR SYSTEMS

1.6 QUALITY ASSURANCE

- A. Manufacturer's Qualifications:
 - 1. Continuously engaged in manufacturing of doors of similar type to that specified, with a minimum of 25 years successful experience.
 - 2. Door and frame components from same manufacturer.
 - 3. Evidence of a compliant documented quality management system.

1.7 DELIVERY, STORAGE, AND PROTECTION

- A. Delivery: Deliver materials to site in manufacturer's original, unopened containers and packaging, with labels clearly identifying opening door mark and manufacturer.
- B. Storage: Store materials in clean, dry area indoors in accordance with manufacturer's instructions.
- C. Handling: Protect materials and finish from damage during handling and installation.

1.8 WARRANTY

- A. Warrant doors, frames, and factory hardware against failure in materials and workmanship, including excessive deflection, faulty operation, defects in hardware installation, and deterioration of finish or construction in excess of normal weathering.
- B. Warranty Period: Ten years starting on date of shipment. In addition, a limited lifetime (while the door is in its specified application in its original installation) warranty covering: failure of corner joinery, core deterioration, delamination or bubbling of door skin.

PART 2 – PRODUCTS

2.1 MANUFACTURERS

- A. Special-Lite, Inc., www.special-lite.com.
- B. Simon Door Company, LLC; www.simondoor.com
- C. Substitutions: See Section 01600 – Product Requirements

2.2 FRP FLUSH DOORS

- A. Model: SL-17 Flush Doors with SpecLite3 fiberglass reinforced polyester (FRP) face sheets.
 - 1. Color: Custom Color – Design Intent is to Match Adjacent Brick Color
- B. Door Opening Size: As indicated on the Drawings.
- C. Construction:
 - 1. Door Thickness: 1-3/4 inches.
 - 2. Stiles and Rails: Aluminum extrusions made from prime-equivalent billet that is produced from 100% reprocessed 6063-T5 alloy recovered from industrial processes, minimum of 2-5/16-inch depth.
 - 3. Corners: Mitered.
 - 4. Provide joinery of 3/8-inch diameter full-width tie rods through extruded splines top and bottom integral to standard tubular shaped stiles and rails reinforced to accept hardware as specified.
 - 5. Securing Internal Door Extrusions: 3/16-inch angle blocks and locking hex nuts for joinery. Welds, glue, or other methods are not acceptable.
 - 6. Furnish extruded stiles and rails with integral reglets to accept face sheets. Lock face sheets into place to permit flush appearance.
 - 7. Rail caps or other face sheet capture methods are not acceptable.
 - 8. Extrude top and bottom rail legs for interlocking continuous weather bar.
 - 9. Meeting Stiles: Pile brush weatherseals. Extrude meeting stile to include integral pocket to accept pile brush weatherseals.
 - 10. Bottom of Door: Install bottom weather bar with nylon brush weatherstripping into extruded interlocking edge of bottom rail.
 - 11. Glue: Use of glue to bond sheet to core or extrusions is not acceptable.

SECTION 08255

FRP FLUSH DOOR SYSTEMS

- D. Face Sheet:
 - 1. Material: FRP, 0.120-inch thickness, finish color throughout.
 - 2. Protective coating: Abuse-resistant engineered surface. Provide FRP with protective coating, or equal.
 - 3. Texture: Pebble.
 - 4. Color: By Architect
 - 5. Adhesion: The use of glue to bond face sheet to foam core is prohibited.
- E. Core:
 - 1. Material: Poured-in-place polyurethane foam.
 - 2. Density: Minimum of 5 pounds per cubic foot.
 - 3. R-Value: Minimum of 9.
- F. Hardware:
 - 1. Premachine doors in accordance with templates from specified hardware manufacturers and hardware schedule.
 - 2. Factory install hardware.

2.3 MATERIALS

- A. Aluminum Members:
 - 1. Aluminum extrusions made from prime-equivalent billet that is produced from 100% reprocessed 6063-T5 alloy recovered from industrial processes: ASTM B 221.
 - 2. Sheet and Plate: ASTM B 209.
 - 3. Alloy and Temper: As required by manufacturer for strength, corrosion resistance, application of required finish, and control of color.
- B. Components: Door and frame components from same manufacturer.
- C. Fasteners:
 - 1. Material: Aluminum, 18-8 stainless steel, or other noncorrosive metal.
 - 2. Compatibility: Compatible with items to be fastened.
 - 3. Exposed Fasteners: Screws with finish matching items to be fastened.

2.4 FABRICATION

- A. Sizes and Profiles: Required sizes for door and frame units, and profile requirements shall be as indicated on the Drawings.
- B. Coordination of Fabrication: Field measure before fabrication and show recorded measurements on shop drawings.
- C. Assembly:
 - 1. Complete cutting, fitting, forming, drilling, and grinding of metal before assembly.
 - 2. Remove burrs from cut edges.
- D. Welding: Welding of doors or frames is not acceptable.
- E. Fit:
 - 1. Maintain continuity of line and accurate relation of planes and angles.
 - 2. Secure attachments and support at mechanical joints with hairline fit at contacting members.

2.5 ALUMINUM DOOR FRAMING SYSTEMS

- A. Tubular Framing:
 - 1. Size and Type: As indicated on the Drawings.
 - 2. Materials: Aluminum extrusions made from prime-equivalent billet that is produced from 100% reprocessed 6063-T5 alloy recovered from industrial processes, 1/8-inch minimum wall thickness.
 - 3. Applied Door Stops: 0.625-inch high, with screws and weatherstripping. Door stop shall incorporate pressure gasketing for weathering seal. Counterpunch fastener holes in door stop to preserve full metal thickness under fastener head.
 - 4. Frame Members: Box type with 4 enclosed sides. Open-back framing is not acceptable.

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FRP FLUSH DOOR SYSTEMS

5. Caulking: Caulk joints before assembling frame members.
6. Joints:
 - a. Secure joints with fasteners.
 - b. Provide hairline butt joint appearance.
7. Field Fabrication: Field fabrication of framing using stick material is not acceptable.
8. Anchors:
 - a. Anchors appropriate for wall conditions to anchor framing to wall materials.
 - b. Door Jamb and Header Mounting Holes: Maximum of 24-inch centers.

PART 3 – EXECUTION

3.1 EXAMINATION

- A. Examine areas to receive doors. Notify Architect of conditions that would adversely affect installation or subsequent use. Do not proceed with installation until unsatisfactory conditions are corrected.

3.2 PREPERATION

- A. Ensure openings to receive frames are plumb, level, square, and in tolerance.

3.3 INSTALLATION

- A. Install doors in accordance with manufacturer's instructions.
- B. Install doors plumb, level, square, true to line, and without warp or rack.
- C. Anchor frames securely in place.
- D. Separate aluminum from other metal surfaces with bituminous coatings or other means approved by Architect.
- E. Install exterior doors to be weathertight in closed position.
- F. Repair minor damages to finish in accordance with manufacturer's instructions and as approved by Architect.
- G. Remove and replace damaged components that cannot be successfully repaired as determined by Architect.

3.4 ADJUSTING

- A. Adjust doors, hinges, and locksets for smooth operation without binding.

3.5 CLEANING AND PROTECTION

- A. Clean doors promptly after installation in accordance with manufacturer's instructions.
- B. Do not use harsh cleaning materials or methods that would damage finish.
- C. Protect installed doors to ensure that, except for normal weathering, doors will be without damage or deterioration at time of substantial completion.

END OF SECTION

SECTION 08310

ACCESS DOORS AND PANELS

PART 1 – GENERAL

1.1 SECTION INCLUDES

- A. Access doors and frames for walls and ceilings.

1.2 RELATED SECTIONS

- A. Section 04810 – Unit Masonry Assemblies.
- B. Section 09260 – Gypsum Board Assemblies.
- C. Section 09511 – Suspended Acoustical Ceilings.
- D. Section 09542 – Linear Metal Ceiling Systems.
- E. Section 09900 – Paints and Coatings.

1.3 REFERENCES

- A. ASTM E119 - Standard Test Methods for Fire Tests of Building Construction and Materials.
- B. NFPA 80 - Standard for Fire Doors and Other Opening Protectives.
- C. NFPA 252 - Standard Methods of Fire Tests of Door Assemblies.
- D. UL – Fire Resistance Directory.

1.4 DESIGN REQUIREMENTS

- A. Fabricate floor access assemblies to support live load of 100 lb/sq ft with deflection not to exceed 1/180 of span.

1.5 SUBMITTALS

- A. See Section 01300 - Administrative Requirements, for submittal procedures.
- B. Product Data: For each type of access door and frame indicated, include construction details, fire ratings, materials, individual components and profiles, hardware and finishes.
- C. Shop Drawings: Show fabrication and installation details of access doors and frames for each type of substrate. Include plans, elevations, sections, details, and attachments to other work.
- D. Samples: For each door face material, at least 3 by 5 inches in size, in specified finish.
- E. Access Door and Frame Schedule: Provide complete access door and frame schedule, including types, locations, sizes, latching or locking provisions, and other data pertinent to installation.
- F. Project Record Documents: Record actual locations of all access units.

1.6 QUALITY ASSURANCE

- A. Source Limitations: Obtain each type of access door(s) and frame(s) through one source from a single manufacturer.
- B. Size Variations: Obtain Architect's acceptance of manufacturer's standard-size units, which may vary slightly from sizes indicated.

1.7 REGULATORY REQUIREMENTS

- A. Fire-Rated Access Doors and Frames: Units complying with NFPA 80 that are identical to access door and frame assemblies tested for fire-test-response characteristics per the following test method and that are listed and labeled by UL or another testing and inspecting agency acceptable to authorities having jurisdiction.
 - 1. NFPA 252 for vertical access doors and frames.
 - 2. ASTM E 119 for horizontal access doors and frames.
 - 3. Provide access doors of fire rating equivalent to the fire rated assembly in which they are to be installed.

1.8 PROJECT CONDITIONS

- A. Coordinate the work with other work requiring access doors.

SECTION 08310

ACCESS DOORS AND PANELS

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Acudor Products Inc.; www.acudor.com.
- B. Babcock-Davis; www.babcockdavis.com.
- C. Bar-Co, Inc.; www.alfabinc.com/barco.html.
- D. Cendrex Inc.; www.cendrex.com.
- E. Dur-Red Products; www.dur-red.com.
- F. Elmdor/Stoneman; www.elmdorstoneman.com.
- G. J.L. Industries, Inc.; www.activarcpg.com/jl-industries.
- H. Karp Associates, Inc: www.karpinc.com.
- I. Larsen's Manufacturing Company; www.larsensmfg.com.
- J. MIFAB, Inc.; www.mifab.com.
- K. Milcor Inc: www.milcorinc.com.
- L. Nystrom, Inc.; www.nystrom.com.
- M. The Williams Bros. Corporation of America; www.wbdoors.com.
- N. Substitutions: See Section 01600 - Product Requirements.

2.2 ACCESS DOOR UNITS - WALLS AND CEILINGS

- A. Flush Access Doors and Frames with Exposed Trim.
 - 1. Ceiling surfaces: Fabricated from steel sheet.
 - 2. Wall surfaces: Fabricated from stainless-steel sheet.
 - 3. Sizes; Unless otherwise noted on drawings:
 - a. Walls: Per Drawings
 - b. Ceilings: Per Drawings
 - 4. Door: Minimum 0.060-inch thick sheet metal, set flush with exposed face flange of frame.
 - 5. Frame: Minimum 0.060-inch thick sheet metal with 1-inch wide, surface-mounted trim.
 - 6. Hinges: Continuous piano.
 - 7. Lock: Cylinder lock with latch; two keys per door.
 - 8. Finish: Paint to Match adjacent material.
- B. Flush Access Doors and Trimless Frames.
 - 1. Ceiling surfaces: Fabricated from steel sheet.
 - 2. Wall surfaces: Fabricated from stainless-steel sheet.
 - 3. Sizes; Unless otherwise noted on drawings:
 - a. Walls: Per Drawings
 - b. Ceilings: Per Drawings
 - 4. Door: Minimum 0.060-inch thick sheet metal, set flush with surrounding finish surfaces.
 - 5. Frame: Minimum 0.060-inch thick sheet metal with drywall bead flange.
 - 6. Hinges: Continuous piano.
 - 7. Lock: Cylinder lock with latch; two keys per door.
 - 8. Finish: Paint to Match adjacent material.
- C. Recessed Access Doors and Trimless Frames.
 - 1. Ceiling surfaces: Fabricated from steel sheet.
 - 2. Wall surfaces: Fabricated from stainless-steel sheet.
 - 3. Sizes; Unless otherwise noted on drawings:
 - a. Walls: Per Drawings
 - b. Ceilings: Per Drawings
 - 4. Door: Minimum 0.060-inch thick sheet metal in the form of a pan recessed 5/8 inch for gypsum board or acoustical tile infill.
 - 5. Frame: Minimum 0.060-inch thick sheet metal with drywall bead for gypsum board surfaces or designed for insertion into acoustical tile ceiling.
 - 6. Hinges: Concealed pivoting rod hinge.
 - 7. Lock: Cylinder lock with latch; two keys per door.
 - 8. Finish: Paint to Match adjacent material.

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ACCESS DOORS AND PANELS

- D. Exterior Flush Access Doors and Frames with Exposed Trim: Weatherproof with extruded door gasket.
 - 1. Locations: Wall and ceiling surfaces.
 - 2. Sizes; Unless otherwise noted on drawings:
 - a. Walls: Per Drawings
 - b. Ceilings: Per Drawings
 - 3. Door: Minimum 0.040-inch thick, metallic-coated steel sheet; flush panel construction with manufacturer's standard 2-inch thick fiberglass insulation.
 - 4. Frame: Minimum 0.060-inch thick extruded aluminum.
 - 5. Hinges: Continuous piano, zinc plated.
 - 6. Lock: Dual-action handles with key lock.
 - 7. Finish: Paint to Match adjacent material.

2.3 FABRICATION

- A. General: Provide access door and frame assemblies manufactured as integral units ready for installation.
- B. Metal Surfaces: For metal surfaces exposed to view in the completed Work, provide materials with smooth, flat surfaces without blemishes. Do not use materials with exposed pitting, seam marks, roller marks, rolled trade names, or roughness.
- C. Doors and Frames: Grind exposed welds smooth and flush with adjacent surfaces. Furnish attachment devices and fasteners of type required to secure access panels to types of supports indicated.
 - 1. Exposed Flanges: As indicated.
 - 2. For trimless frames with drywall bead, provide edge trim for gypsum board securely attached to perimeter of frames.
 - 3. Provide mounting holes in frames for attachment of units to metal or wood framing.
 - 4. Provide mounting holes in frame for attachment of masonry anchors. Furnish adjustable metal masonry anchors.
- D. Recessed Access Doors: Form face of panel to provide recess for application of applied finish. Reinforce panel as required to prevent buckling.
- E. Latching Mechanisms: Furnish number required to hold doors in flush, smooth plane when closed.
 - 1. For cylinder lock, furnish two keys per lock and key all locks alike.
 - 2. For recessed panel doors, provide access sleeves for each locking device. Furnish plastic grommets and install in holes cut through finish.
- F. Extruded Aluminum: After fabrication, apply manufacturer's standard protective coating on aluminum that will come in contact with concrete.

PART 3 – EXECUTION

3.1 EXAMINATION

- A. Verify that rough openings for door and frame are correctly sized and located.

3.2 INSTALLATION

- A. Install units in accordance with manufacturer's instructions.
- B. Set frames accurately in position and attach securely to supports with plane of face panels aligned with adjacent finish surfaces.
- C. Install doors flush with adjacent finish surfaces or recessed to receive finish material.
- D. Position units to provide convenient access to the concealed work requiring access.

SECTION 08310

ACCESS DOORS AND PANELS

3.3 ADJUSTING AND CLEANING

- A. Adjust doors and hardware after installation for proper operation.
- B. Remove and replace doors and frames that are warped, bowed, or otherwise damaged.

END OF SECTION

SECTION 08360

INSULATED ROLLING SERVICE DOORS

PART 1 – GENERAL

1.1 SUMMARY

- A. Section Includes: Overhead insulated rolling doors.
- B. Related Sections:
 - 1. Section 05500: Metal Fabrications. Door opening jamb and head members.
 - 2. Section 09900: Painting. Field painting jamb and head members.

1.2 SYSTEM DESCRIPTION

- A. Design Requirements:
 - 1. Air infiltration to comply with:
 - a. ASHRAE® (American Society of Heating, Refrigeration, and Air-Conditioning Engineers) Standard 90.1- 2010 & 2013 requirements of less than .40 CFM/FT²
 - b. Air infiltration to comply with IECC® (International Energy Conservation Code) 2012 requirements of less than 1.0 CFM/FT²
 - 2. Wind Loading: Supply doors to withstand up to the maximum wind load as required per code for Illinois zoning.
 - 3. Cycle Life:
 - a. Design doors of standard construction for normal use of up to 20 cycle per day maximum, and an overall maximum of 50,000 operating cycles for the life of the door.
 - 4. Insulated Door Slat Material Requirements:
 - a. Flame Spread Index of 0 and a Smoke Developed Index of 10 as tested per ASTM E84.
 - b. Minimum Sound Transmission Class (STC) rating of 22 as tested per ASTM E90.
 - c. Minimum R-value of 8.0 (U-value of 0.125) as calculated using the ASHRAE Handbook of Fundamentals.
 - d. Insulation to be CFC Free with an Ozone Depletion Potential (ODP) rating of zero.

1.3 SUBMITTALS

- A. Reference Section 01300 Submittal Procedures; submit the following items:
 - 1. Product Data.
 - 2. Shop Drawings: Include special conditions not detailed in Product Data. Show interface with adjacent work.
 - 3. Quality Assurance/Control Submittals:
 - a. Provide proof of manufacturer ISO 9001:2008 registration.
 - b. Provide proof of manufacturer and installer qualifications - see 1.4 below.
 - c. Provide manufacturer's installation instructions
 - d. Provide independent testing lab results proving .40 CFM/FT² or less air infiltration

1.4 QUALITY ASSURANCE

- A. Qualifications:
 - 1. Manufacturer Qualifications: ISO 9001:2008 registered and a minimum of five years experience in producing doors of the type specified.
 - 2. Installer Qualifications: Manufacturer's approval.

1.5 DELIVERY, STORAGE AND HANDLING

- A. Reference Section 01660 Product Storage and Handling Requirements.
- B. Follow manufacturer's instructions.

1.6 WARRANTY

- A. Standard Warranty: Two years from date of shipment against defects in material and workmanship.
- B. Maintenance: Submit for owner's consideration and acceptance of a maintenance service agreement for installed products.

SECTION 08360

INSULATED ROLLING SERVICE DOORS

PART 2 – PRODUCTS

2.1 MANUFACTURER

- A. Manufacturer: Cornell Cookson, Inc., Crestwood Industrial Park, Mountaintop, PA 18707. Telephone: (800) 233-8366, Fax: (800) 526-0841. Underwriters Laboratories, Inc. (UL), ISO 9001:2008 Registered.
 - 1. Distributor: Door Masters
 - a. Stephanie Anagnos
 - b. 1225 N. Convent, Bourbonnais, IL 60914
 - c. Phone: 815-933-3667
- B. Model: ESD20 – stainless steel
 - 1. Motor operated, hoist type operator with aux, chain fall, EMA 4X photo cells for primary entrapment
 - 2. Provide 2 Remote controls compatible with Lift Master 894LT.
- C. Substitutions: Reference Section 01600 Product Substitution Procedures.

2.2 MATERIALS

- A. Curtain:
 - 1. Air infiltration rate of less than .40 CFM/FT² validated by an independent testing agency.
 - a. Test report required.
 - 2. Slat Material: No. 6F, (Listed Exterior):
 - a. Stainless Steel: 22 gauge AISI type 304 series stainless steel.
 - b. Insulation: 7/8 inch (22 mm) foamed-in-place, closed cell urethane.
 - c. Total Slat Thickness: 15/16 inch (24 mm).
 - d. Slats have a Flame Spread Index of 0 and a Smoke Developed Index of 10 as tested per ASTM E84.
 - e. Slat has an R-value of 8.0 and an STC rating of 22.
 - 3. Bottom Bar: Reinforced extruded aluminum interior face with full depth insulation and exterior skin slat to match curtain material and gauge.
 - 4. Fabricate interlocking sections with high strength [nylon] [cast iron] endlocks on alternate slats each secured with two ¼" (6.35 mm) rivets. Provide windlocks as required to meet specified wind load.
 - 5. Curtain Configuration
 - a. Standard Curtain configuration.
 - 6. Bottom Bar Finish:
 - a. Exterior Face: Match slats.
 - b. Interior Face: Anodized – color to be selected by architect from manufacturer's full line.
 - c. Bottom bar to include air infiltration certification label.
 - 7. Bottom Bar Configuration:
 - a. Standard Bottom Bar Configuration.
- B. Guides: Thermal break required. Fabricate with minimum 3/16 inch structural steel angles. Provide windlock bars of same material when windlocks are required to meet specified wind load. Top of inner and outer guide angles to be flared outwards to form bellmouth for smooth entry of curtain into guides. Provide removable guide stoppers to prevent over travel of curtain and bottom bar. Top 16 ½" (419.10 mm) of coil side guide angles to be removable for ease of curtain installation and as needed for future curtain service.
 - 1. Finish:
 - a. Steel: Phosphate treatment followed by baked-on polyester powder coat, color as selected by Architect from manufacturer's standard color range, minimum 32 colors; minimum 2.5 mils cured film thickness; ASTM D-3363 pencil hardness: H or better.
 - 2. Configuration: Standard Guide Configuration.
 - 3. Barrel: Steel pipe capable of supporting curtain load with maximum deflection of 0.03 inches per foot (2.5 mm per meter) of width.

SECTION 08360

INSULATED ROLLING SERVICE DOORS

4. Spring Balance: Oil-tempered, heat-treated steel helical torsion spring assembly designed for proper balance of door to ensure that maximum effort to operate will not exceed 25 lbs (110 N). Provide wheel for applying and adjusting spring torque.
- C. Brackets: Fabricate from minimum 3/16 inch steel plate with permanently lubricated ball or roller bearings at rotating support points to support counterbalance shaft assembly and form end closures.
 1. Finish:
 - a. Phosphate treatment followed by baked-on polyester powder coat, color as selected by Architect from manufacturer's standard color range; minimum 2.5 mils cured film thickness; ASTM D-3363 pencil hardness: H or better.
- D. Hood: 24 gauge galvanized steel with reinforced top and bottom edges. Provide minimum 1/4 inch steel intermediate support brackets as required to prevent excessive sag.
 1. Finish:
 - a. GalvaNex™ Coating System and phosphate treatment followed by baked-on polyester powder coat, color as selected by Architect from manufacturer's standard color range, minimum 32 colors; minimum 2.5 mils cured film thickness; ASTM D-3363 pencil hardness: H or better.
- E. Weatherstripping:
 1. Bottom Bar: Replaceable, bulb-style, compressible EDPM gasket extending into guides.
 2. Hood: Neoprene/rayon baffle to impede air flow above coil.
 3. Guide seals.
 4. Hardware. Padlocks; Master keyed cylinder.

2.3 OPERATION

- A. Motor operated, hoist type operator with aux, chain fall, EMA 4X photo cells for primary entrapment.
- B. Remote controls compatible with Liftmaster.

PART 3 – EXECUTION

3.1 EXAMINATION

- A. Examine substrates upon which work will be installed and verify conditions are in accordance with approved shop drawings.
- B. Coordinate with responsible entity to perform corrective work on unsatisfactory substrates.
- C. Commencement of work by installer is acceptance of substrate.

3.2 INSTALLATION

- A. General: Install door and operating equipment with necessary hardware, anchors, inserts, hangers and supports.
- B. Follow manufacturer's installation instructions.

3.3 ADJUSTING

- A. Following completion of installation, including related work by others, lubricate, test, and adjust doors for ease of operation, free from warp, twist, or distortion.

3.4 CLEANING

- A. Clean surfaces soiled by work as recommended by manufacturer.
- B. Remove surplus materials and debris from the site.

3.5 DEMONSTRATION

- A. Demonstrate proper operation to Owner's Representative.
- B. Instruct Owner's Representative in maintenance procedures.

END OF SECTION

SECTION 08410

ALUMINUM STOREFRONT SYSTEM

PART 1 – GENERAL

1.1 SECTION INCLUDES

- A. Glazed aluminum framed storefront assembly.
- B. Perimeter sealant.

1.2 RELATED SECTIONS

- A. Section 07900 – Joint Sealants: Assembly perimeter sealant and back-up materials.
- B. Section 08520 – Aluminum Entrances: Door and frame assembly to fit within this glazed assembly.
- C. Section 08710 – Door Hardware: Mortised hardware reinforcement requirements affecting framing members.
- D. Section 08800 – Glazing.

1.3 REFERENCES

- A. AA (Aluminum Association), Designation System for Aluminum Finishes.
- B. AAMA SFM-1-87, Aluminum Storefront and Entrance Manual.
- C. AAMA 501.1-05, Standard Test Method for Water Penetration of Windows, Curtain Walls and doors using Dynamic Pressure.
- D. AAMA 501.2-09, Quality Assurance and Diagnostic Water Leakage Field Check of Installed Storefronts, Curtain Walls, and Sloped Glazing Systems.
- E. AAMA 503-08, Voluntary Specification for Field Testing of Newly Installed Fenestration Products
- F. AAMA 609/610-09, Cleaning and Maintenance Guide for Architecturally Finished Aluminum.
- G. AAMA 611-12, Voluntary Specifications for Anodized Architectural Aluminum.
- H. AAMA 1503-09, Voluntary Test Method for Thermal Transmittance and Condensation Resistance of Windows, Doors, and Glazed Wall Sections.
- I. AAMA 2604-10, Voluntary Specification, Performance Requirements and Test Procedures for High Performance Organic Coatings on Aluminum Extrusions and Panels.
- J. AAMA 2605-11, Voluntary Specification, Performance Requirements and Test Procedures for Superior Performing Organic Coatings on Aluminum Extrusions and Panels.
- K. ASTM A 123/A 123M, Zinc (Hot Dip Galvanized) Coatings on Iron and Steel Products.
- L. ASTM A 653/A 653M, Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvanized) by the Hot-Dip Process.
- M. ASTM B 209/B 209M, Aluminum and Aluminum-Alloy Sheet and Plate.
- N. ASTM B 221/B 221M, Aluminum and Aluminum-Alloy Extruded Bar, Rod, Wire, Shape and Tube.
- O. ASTM E 283, Rate of Air Leakage Through Exterior Windows, Skylights, Curtain Walls, and Doors.
- P. ASTM E 330, Test Method for Structural Performance of Exterior Windows, Skylights, Curtain Walls, and Doors by Uniform Static Air Pressure Difference.
- Q. ASTM E 331, Test Method for Water Penetration of Exterior Windows, Skylights, Curtain Walls, and Doors by Uniform Static Air Pressure Difference.

1.4 SYSTEM DESCRIPTION

- A. Aluminum storefront assembly includes split aluminum sections, tubular aluminum sections with supplementary internal framing; shop fabricated, vision glass, related flashings, anchorage, and attachment devices.
- B. Frame Assembly: Site assembled.

1.5 PERFORMANCE REQUIREMENTS

- A. Assembly Design: Design and size components to withstand dead and live loads caused by positive and negative wind pressure acting normal to the plane of the wall as calculated in accordance with the applicable code.

SECTION 08410

ALUMINUM STOREFRONT SYSTEM

- B. Assembly: Accommodate without damage to components or deterioration of seals, movement between system and peripheral construction, dynamic loading and release of loads, deflection of structural support framing.
- C. Structural Performance – Deflection: Limit mullion deflection to flexural limit of glass as measured in accordance with ASTM E 330; with full recovery of members.
- D. Air Infiltration: Limit air leakage through the assembly to 0.06 cfm/ft² of wall area, measured at a reference differential pressure across the assembly of 1.57 psf as measured in accordance with ASTM E 283.
- E. Static Water Leakage: None, as measured in accordance with ASTM E 331 with a test pressure difference of 2.86 psf.
- F. Dynamic Water Leakage: None, as measured in accordance with AAMA 501.1 with a test pressure difference of 2.86 psf.
- G. Condensation Resistance Factor (CRF): 57 when measured in accordance with AAMA 1503.
- H. Thermal Transmittance (U Factor): 0.52 BTU/hr•ft²•degree F when measured in accordance with AAMA 1503.
- I. Air and Vapor Seal: Maintain continuous air barrier and vapor seal throughout assembly, primarily in line with lite of glass.
- J. Expansion/Contraction: Provide for expansion and contraction within assembly components caused by ambient cycling temperature range of 170 degrees F over a twelve (12) hour period based on a metal installation temperature of 85 degrees F (29 degrees C), without causing detrimental effect to assembly components and anchorage.
- K. System Internal Drainage: Drain water entering joints, condensation occurring in glazing channels, or migrating moisture occurring within system, to the exterior by a weep drainage network.

1.6 SUBMITTALS

- A. Section 01300: Submission Procedures.
- B. Product Data: Provide component dimensions; describe components within assembly, anchorage and fasteners and internal drainage details.
- C. Design Data: Provide framing member structural and physical characteristics, calculations, dimensional limitations.
- D. Shop Drawings: Indicate system dimensions, framed opening requirements and tolerances, affected related work and expansion and contraction joint location and details.
- E. Submit two samples 1-3/4 x 4 inch in size illustrating full range of finished aluminum surface.
- F. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.

1.7 QUALITY ASSURANCE

- A. Design and fabricate according to AAMA SFM-1.
- B. Manufacturer and Installer: Company specializing in manufacturing aluminum glazing systems with minimum three years documented experience.
- C. Design structural support framing components under direct supervision of a Professional Structural Engineer experienced in design of this work and licensed at the place where the Project is located.

1.8 PRE-INSTALLATION MEETING

- A. Section 01300: Pre-installation meeting.
- B. Convene one week before starting work on this section.

1.9 DELIVERY, STORAGE, AND PROTECTION

- A. Section 01600: Transport, handle, store, and protect products.
- B. Handle products of this section in accordance with AAMA – SFM-1.
- C. Protect finished aluminum surfaces with removable protective material. Do not use adhesive papers or sprayed coatings which bond when exposed to sunlight or weather.

SECTION 08410

ALUMINUM STOREFRONT SYSTEM

1.10 WARRANTY

- A. Section 01700: Warranties.
- B. Correct defective work within a one (1) year period after substantial completion.
- C. Warranty: Include coverage for complete system for failure to meet specified requirements.
- D. Provide five (5) year manufacturer warranty for glazed units.

PART 2 – PRODUCTS

2.1 MANUFACTURERS

- A. Basis of Design: EFCO Commercial Solutions; www.efcocorp.com.
 - 1. Series 433SS: **Triple Set™ Thermal Screw Spline Storefront-2" x 4-1/2"** Thermal Storefront Framing.
- B. Substitutions: See Section 01600 - Product Requirements.

2.2 MATERIALS

- A. Extruded Aluminum: ASTM B 221, 6063 alloy of T6 temper.
- B. Sheet Aluminum: ASTM B 209
- C. Sheet Steel: ASTM A 653/ASTM A 653M; galvanized.
- D. Fasteners: Stainless steel.

2.3 COMPONENTS

- A. Frame:
 - 1. Exposed to view Nominal Width: 2 inch.
 - 2. Nominal Depth: 4 1/2 inch.
 - 3. Glazing Pocket Depth: 1 inch.
 - 4. Intermediate and Sill Horizontal Members.
 - 5. Mounting and Attachments from the head or sill.
 - 6. Flush, snap in glazing stops.
 - 7. Drainage Holes: Concealed internal weep drainage network.
- B. Reinforced Mullion: Extruded aluminum section with internal reinforcement of steel channel-shaped section, tubular steel section or extruded aluminum section.
- C. Doors: Specified in Section 08520.
- D. Door Hardware: Specified in Section 08700.
- E. Flashings: 0.040 inch thick aluminum finish to match mullion sections, where exposed.

2.4 GLASS AND GLAZING MATERIALS

- A. Glass: Specified in Section 08800 and on drawings.
- B. Glazing Materials: Dense EPDM wedge type gasket exterior and interior, to suit applications and achieve weather, moisture and air infiltration requirements.

2.5 SEALANT MATERIALS

- A. Sealant and Backing Materials – refer to Section 07900.

2.6 FABRICATION

- A. Fabricate components with minimum clearances and shim spacing around perimeter of assembly, yet enabling installation and dynamic movement of perimeter seal.
- B. Accurately fit and secure joints and corners. Make joints flush, hairline, and weatherproof.
- C. Prepare components to receive anchor devices. Fabricate anchors.
- D. Arrange fasteners and attachments to conceal from view.
- E. Prepare components with internal reinforcement for door hardware.
- F. Reinforce framing members for imposed loads.

SECTION 08410

ALUMINUM STOREFRONT SYSTEM

2.7 FINISHES

- A. Exposed Aluminum Surfaces: AA M10 C21, A41, anodized to Class I; Clear anodized color.
- B. Finish of Exposed Aluminum shall be compliant with the performance standards set forth in AAMA Specification 2604, High Performance Organic Coatings on Aluminum.

PART 3 – EXECUTION

3.1 EXAMINATION

- A. Section 01700: Verification of existing conditions before starting work.
- B. Verify dimensions, tolerances, and method of attachment with other work.
- C. Verify wall openings and adjoining air and vapor seal materials are ready to receive work of this section.

3.2 INSTALLATION

- A. Install wall assembly in accordance with manufacturer's instructions.
- B. Attach to structure to permit sufficient adjustment to accommodate construction tolerances and other irregularities.
- C. Provide alignment attachments and shims to permanently fasten system to building structure.
- D. Align assembly plumb and level, free of warp or twist. Maintain assembly dimensional tolerances, aligning with adjacent work.
- E. Provide thermal isolation where components penetrate or disrupt building insulation.
- F. Install flashings. Turn up ends and edges; seal to adjacent work to form water tight end dam.
- G. Coordinate attachment and seal of perimeter air and vapor barrier materials.
- H. Pack fibrous insulation in shim spaces at perimeter of assembly to maintain continuity of thermal barrier.
- I. Install operating sash to sash manufacturer's installation requirements.
- J. Install flashings, full opening width, consisting of one piece. If width of opening requires additional pieces, splice per manufacturer's instructions.
- K. Set thresholds in bed of mastic and secure.
- L. Install hardware using physical hardware and templates provided.
- M. Install glass in accordance with Section 08800, utilizing glazing method required to achieve performance criteria.
- N. Install Perimeter Sealant according to the requirements of Section 07900.

3.3 ERECTION TOLERANCES

- A. Section 01400: Tolerances.
- B. Maximum Variation from Plumb: 1/16 inch every 3 feet non-cumulative or 1/16 inch per 10 feet, whichever is less
- C. Maximum Misalignment of Two Adjoining Members Abutting in Plane: 1/32 inch.

3.4 ADJUSTING

- A. Adjust operating hardware for smooth operation.

3.5 CLEANING

- A. Remove protective material from pre-finished aluminum surfaces.
- B. Wash down surfaces with a solution of mild detergent in warm water, applied with soft, clean wiping cloths. Take care to remove dirt from corners. Wipe surfaces clean.
- C. Remove excess sealant employing a method acceptable to sealant manufacturer and finish supplier.

3.6 PROTECTION OF FINISHED WORK

- A. Protect finished work from damage.

END OF SECTION

SECTION 08520

ALUMINUM ENTRANCES

PART 1 – GENERAL

1.1 SECTION INCLUDES

- A. Aluminum single and double leaf thermal glazed doors.
- B. Perimeter sealant.

1.2 RELATED SECTIONS

- A. Section 07900 – Joint Sealants: Assembly perimeter sealant and back-up materials.
- B. Section 08410 – Aluminum Storefront Systems
- C. Section 08710 – Door Hardware: Mortised hardware reinforcement requirements affecting framing members.
- D. Section 08800 – Glazing.

1.3 REFERENCES

- A. AA (Aluminum Association), Designation System for Aluminum Finishes.
- B. AAMA SFM-1-87, Aluminum Storefront and Entrance Manual.
- C. AAMA 501.1-05, Standard Test Method for Water Penetration of Windows, Curtain Walls and doors using Dynamic Pressure.
- D. AAMA 501.2-09, Quality Assurance and Diagnostic Water Leakage Field Check of Installed Storefronts, Curtain Walls, and Sloped Glazing Systems.
- E. AAMA 503-08, Voluntary Specification for Field Testing of Newly Installed Fenestration Products
- F. AAMA 609/610-09, Cleaning and Maintenance Guide for Architecturally Finished Aluminum.
- G. AAMA 611-12, Voluntary Specifications for Anodized Architectural Aluminum.
- H. AAMA 1503-09, Voluntary Test Method for Thermal Transmittance and Condensation Resistance of Windows, Doors, and Glazed Wall Sections.
- I. AAMA 2604-10, Voluntary Specification, Performance Requirements and Test Procedures for High Performance Organic Coatings on Aluminum Extrusions and Panels.
- J. AAMA 2605-11, Voluntary Specification, Performance Requirements and Test Procedures for Superior Performing Organic Coatings on Aluminum Extrusions and Panels.
- K. ASTM A 123/A 123M, Zinc (Hot Dip Galvanized) Coatings on Iron and Steel Products.
- L. ASTM A 653/A 653M, Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvanized) by the Hot-Dip Process.
- M. ASTM B 209/B 209M, Aluminum and Aluminum-Alloy Sheet and Plate.
- N. ASTM B 221/B 221M, Aluminum and Aluminum-Alloy Extruded Bar, Rod, Wire, Shape and Tube.
- O. ASTM E 283, Rate of Air Leakage Through Exterior Windows, Skylights, Curtain Walls, and Doors.
- P. ASTM E 330, Test Method for Structural Performance of Exterior Windows, Skylights, Curtain Walls, and Doors by Uniform Static Air Pressure Difference.
- Q. ASTM E 331, Test Method for Water Penetration of Exterior Windows, Skylights, Curtain Walls, and Doors by Uniform Static Air Pressure Difference.

1.4 SYSTEM DESCRIPTION

- A. Aluminum doors include tubular aluminum and polyamide assembled sections with supplementary internal tensioned-rod support framing, interlocking rigid corners, shop fabricated, factory finished, vision glass, anchorage and attachment devices.
- B. Door and Frame Assembly: Factory assembled.

1.5 PERFORMANCE REQUIREMENTS

- A. Assembly Design: Design and size components to withstand dead and live loads caused by positive and negative wind pressure acting normal to the plane of the wall as calculated in accordance with the applicable code.

SECTION 08520

ALUMINUM ENTRANCES

- B. Assembly: Accommodate without damage to components or deterioration of seals, movement between system and peripheral construction, dynamic loading and release of loads, deflection of structural support framing.
- C. Structural Performance – Deflection: Limit mullion deflection to flexural limit of glass as measured in accordance with ASTM E 330; with full recovery of members.
- D. Air Infiltration: Limit air leakage through the assembly to 0.06 cfm/ft² of wall area, measured at a reference differential pressure across the assembly of 1.57 psf as measured in accordance with ASTM E 283.
- E. Static Water Leakage: None, as measured in accordance with ASTM E 331 with a test pressure difference of 2.86 psf.
- F. Dynamic Water Leakage: None, as measured in accordance with AAMA 501.1 with a test pressure difference of 2.86 psf.
- G. Condensation Resistance Factor (CRF): 57 when measured in accordance with AAMA 1503.
- H. Thermal Transmittance (U Factor): 0.52 BTU/hr•ft²•degree F when measured in accordance with AAMA 1503.
- I. Air and Vapor Seal: Maintain continuous air barrier and vapor seal throughout assembly, primarily in line with lite of glass.
- J. Expansion/Contraction: Provide for expansion and contraction within assembly components caused by ambient cycling temperature range of 170 degrees F over a twelve (12) hour period based on a metal installation temperature of 85 degrees F (29 degrees C), without causing detrimental effect to assembly components and anchorage.
- K. System Internal Drainage: Drain water entering joints, condensation occurring in glazing channels, or migrating moisture occurring within system, to the exterior by a weep drainage network.

1.6 SUBMITTALS FOR REVIEW

- A. Section 01300: Submission Procedures.
- B. Product Data: Provide component dimensions; describe components within assembly, anchorage and fasteners and internal drainage details.
- C. Design Data: Provide framing member structural and physical characteristics, calculations, dimensional limitations.
- D. Shop Drawings: Indicate system dimensions, framed opening requirements and tolerances, affected related work and expansion and contraction joint location and details.
- E. Submit two samples 1-3/4 x 4 inch in size illustrating full range of finished aluminum surface.
- F. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.

1.7 QUALITY ASSURANCE

- A. Design and fabricate according to AAMA SFM-1.
- B. Perform work according to AAMA SFM-1.
- C. Conform to ADAG access requirements provided in the Illinois Accessibility Code.
- D. Manufacturer and Installer: Company specializing in manufacturing aluminum glazing systems with minimum three years documented experience.
- E. Design structural support framing components under direct supervision of a Professional Structural Engineer experienced in design of this work and licensed at the place where the Project is located.

1.8 PRE-INSTALLATION MEETING

- A. Section 01300: Pre-installation meeting.
- B. Convene one week before starting work on this section.

1.9 DELIVERY, STORAGE, AND PROTECTION

- A. Section 01660: Transport, handle, store, and protect products.
- B. Handle products of this section in accordance with AAMA – SFM-1.
- C. Protect finished aluminum surfaces with removable protective material. Do not use adhesive papers or sprayed coatings which bond when exposed to sunlight or weather.

SECTION 08520

ALUMINUM ENTRANCES

1.10 WARRANTY

- A. Section 01700: Warranties.
- B. Correct defective work within a one (1) year period after substantial completion.
- C. Warranty: Include coverage for complete system for failure to meet specified requirements.
- D. Provide five (5) year manufacturer warranty for glazed units.

PART 2 – PRODUCTS

2.1 MANUFACTURERS

- A. Basis of Design: EFCO Commercial Solutions; www.efcocorp.com
 - 1. Series D500 Wide Stile: 1-3/4" Standard Aluminum Swing Entrance Doors.
- B. Or approved equal.

2.2 MATERIALS

- A. Extruded Aluminum: ASTM B 221, 6063 alloy of T6 temper.
- B. Sheet Aluminum: ASTM B 209.
- C. Sheet Steel: ASTM A 653/ASTM A 653M; galvanized.
- D. Fasteners: Stainless steel.

2.3 COMPONENTS

- A. Frame:
 - 1. Exposed to view Nominal Width: 2 inch.
 - 2. Nominal Depth: 4 1/2 inch.
 - 3. Frame Assembly with thermal design.
 - 4. Intermediate and Sill Horizontal Members.
 - 5. Mounting and Attachments from the head or sill.
 - 6. Flush, snap in glazing stops.
 - 7. Drainage Holes: Concealed internal weep drainage network.
- B. All aluminum doors to be provided with 4 hinges, evenly spaced – refer to Section 08710.
- C. Reinforced Mullion: Extruded aluminum section with internal reinforcement of steel channel-shaped section, tubular steel section or extruded aluminum section.
 - 1. Provide an opening of 3/4" vertical throughout the mullions (for wiring, etc).
- D. Wide Stile Doors:
 - 1. Leaf thickness: 1-3/4" inch.
 - 2. Top Rail: As indicated on drawings.
 - 3. Bottom Rail: As indicated on drawings.
 - 4. Stiles: As indicated on drawings.
 - 5. Glazing Stops: Square 3/4 inch (19 mm) for 1 inch (25 mm) glazing.

2.4 GLASS AND GLAZING MATERIALS

- A. Glass: Specified in Section 08800.
- B. Glazing Materials: Dense EPDM wedge type gasket exterior and interior, to suit applications and achieve weather, moisture and air infiltration requirements.

2.5 HARDWARE

- A. Door Hardware specified in Section 08710
- B. Aluminum entrances manufacturer to provide perimeter and meeting style weather-stripping.

2.6 FABRICATION

- A. Fabricate components with minimum clearances and shim spacing around perimeter of assembly, yet enabling installation and dynamic movement of perimeter seal.
- B. Accurately fit and secure joints and corners. Make joints flush, hairline, and weatherproof.
- C. Prepare components to receive anchor devices. Fabricate anchors.

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ALUMINUM ENTRANCES

- D. Arrange fasteners and attachments to conceal from view.
- E. Prepare components with internal reinforcement for door hardware and electric strike hardware.
- F. Reinforce framing members for imposed loads.
- G. Factory install hardware using physical hardware and templates provided.
- H. Glazing – refer to section 08800.

2.7 FINISHES

- A. Exposed Aluminum Surfaces: AA M10 C21, A41, anodized to Class I, Clear anodized color.

PART 3 – EXECUTION

3.1 EXAMINATION

- A. Section 01700: Verification of existing conditions before starting work.
- B. Verify dimensions, tolerances, and method of attachment with other work.
- C. Verify wall openings and adjoining air and vapor seal materials are ready to receive work of this section.

3.2 INSTALLATION

- A. Attach to structure to permit sufficient adjustment to accommodate construction tolerances and other irregularities.
- B. Provide alignment attachments and shims to permanently fasten system to building structure.
- C. Align assembly plumb and level, free of warp or twist. Maintain assembly dimensional tolerances, aligning with adjacent work.
- D. Set thresholds in bead of sealant and secure to structure.
- E. Install hardware using physical hardware and templates provided.
- F. Install glass in accordance with Section 08800, utilizing glazing method required to achieve performance criteria.
- G. Install Perimeter Sealant according to the requirements of Section 07900.

3.3 ERECTION TOLERANCES

- A. Section 01400: Tolerances.
- B. Maximum Variation from Plumb: 1/16 inch every 3 feet non-cumulative or 1/16 inch per 10 feet, whichever is less
- C. Maximum Misalignment of Two Adjoining Members Abutting in Plane: 1/32 inch (0.8 mm).

3.4 ADJUSTING

- A. Adjust operating hardware for smooth operation.

3.5 CLEANING

- A. Remove protective material from pre-finished aluminum surfaces.
- B. Wash down surfaces with a solution of mild detergent in warm water, applied with soft, clean wiping cloths. Take care to remove dirt from corners. Wipe surfaces clean.
- C. Remove excess sealant employing a method acceptable to sealant manufacturer and finish supplier.

3.6 PROTECTION OF FINISHED WORK

- A. Protect finished work from damage.

END OF SECTION

SECTION 08710

DOOR HARDWARE

PART 1 – GENERAL

1.1 SECTION INCLUDES

- A. Lock cylinders for doors for which hardware is specified in other sections.
- B. Hardware for all doors.

1.2 RELATED SECTIONS

- A. Section 08211 - Flush Wood Doors.

1.3 SUBMITTALS

- A. See Section 01300 - Administrative Requirements, for submittal procedures.
- B. Shop Drawings:
 - 1. Indicate locations and mounting heights of each type of hardware, schedules, catalog cuts, electrical characteristics and connection requirements.
 - 2. Samples will be returned to supplier.
- C. Maintenance Data: Include data on operating hardware, lubrication requirements, and inspection procedures related to preventative maintenance.

1.4 QUALITY ASSURANCE

- A. Hardware Supplier Qualifications: Company specializing in supplying commercial door hardware with five years of experience.

1.5 PRE-INSTALLATION MEETING

- A. Convene one week prior to commencing work of this section.

1.6 DELIVERY, STORAGE, AND PROTECTION

- A. Package hardware items individually; label and identify each package with door opening code to match hardware schedule.

1.7 COORDINATION

- A. Coordinate the work with other directly affected sections involving manufacture or fabrication of internal reinforcement for door hardware.
- B. Furnish templates for door and frame preparation.
- C. Coordinate Owner's keying requirements during the course of the Work

1.8 WARRANTY

- A. See Section 01780 - Closeout Submittals, for additional warranty requirements.

PART 2 – PRODUCTS

2.1 MANUFACTURERS

- A. Hager:
 - 1. Hinges.
- B. VonDuprin:
 - 1. Exit Devices.
 - 2. Electric Retraction Exit Devices.
 - 3. Removable Mullions.
 - 4. Electronic Power Transfers.
 - 5. Electric Strike.
- C. Schlage:
 - 1. Cylinders.
 - 2. Locksets.

SECTION 08710

DOOR HARDWARE

- D. LCN:
 - 1. Closers.
 - 2. Drop Plates
- E. National Guard Products:
 - 1. Thresholds.
 - 2. Door Sweeps.
- F. Rockwood Manufacturing:
 - 1. Wall and Floor Stops.
 - 2. Kick Plates.
 - 3. Door Silencers.
- G. HES:
 - 1. Electric Strike
- H. IVES:
 - 1. Push/Pulls

2.2 GENERAL REQUIREMENTS FOR DOOR HARDWARE PRODUCTS

- A. Provide products that comply with the following:
 - 1. Applicable provisions of Federal, State, and local codes.
- B. Finishes: Identified in schedule at end of section.

PART 3 – EXECUTION

3.1 EXAMINATION

- A. Verify that doors and frames are ready to receive work and dimensions are as indicated on shop drawings.

3.2 INSTALLATION

- A. Install hardware in accordance with manufacturer's instructions and applicable codes.
- B. Use templates provided by hardware item manufacturer.
- C. Mounting heights for hardware from finished floor to center line of hardware item: As listed in Schedule, unless otherwise noted:

3.3 ADJUSTING

- A. Adjust work under provisions of Section 01700.
- B. Adjust hardware for smooth operation.

3.4 PROTECTION OF FINISHED WORK

- A. Protect finished Work under provisions of Section 01700.
- B. Do not permit adjacent work to damage hardware or finish.

3.5 SCHEDULE

- A. Hardware Sets
Items of hardware not definitely specified herein, but necessary for completion of the Work shall be provided. Such items shall be of type and quality suitable to the service required and comparable to the adjacent hardware. Where size and shape of members is such as to prevent the use of types specified, hardware shall be furnished of suitable types having as nearly as practicable the same operation and quality as the type specified. Sizes shall be adequate for the service required. Include such nuances as strike type, strike lip, raised barrel hinges, mounting brackets, fasteners, shims, and coordination between conflicting products. All doors shall be provided with a stop. Fire rated openings shall be provided as positive latching and self-closing regardless of what is specified in the sets.

SECTION 08710

DOOR HARDWARE

- B. The following schedule is a partial list to establish quantity and to generalize hardware installation requirements. A detailed schedule shall be developed by the supplier to assure proper operation and function of the scheduled intent.
- C. Coordinate final selection of all hardware with Owner in field prior to submittal of shop drawings.
- D. Provide manufacturer's hardware templates to installing contractor with hardware delivery.
- E. Coordinate delivery of all hardware with installing contractor.
- F. Mounting heights for hardware from finished floor to center line of hardware item:
 - 1. Door Levers: 38 inches;
 - 2. Door Pulls / Push Plates: 44 inches;
 - 3. Single Push Bars: 42 inches;
 - 4. Exit Device Cross Bars: 42 inches;
 - 5. Cylinder Dead Locks: 48 inches;
 - 6. Flush Bolts: 72 inches top; 12 inches bottom;
 - 7. Upper Edge Top Hinge: 5 inches below frame head;
 - 8. Lower Edge Top Hinge: 10 inches above finished floor;
 - 9. Intermediate Hinge(s): Equally spaces between top and bottom hinges.
- G. **ALL LOCKS TO BE KEYED TO "0"**
- H. **PROVIDE TWO (2) "0" CONTROL KEYS**

HARDWARE SET 1 (STOREROOM DOORS W/DOOR CLOSER 100 DEGREES) 115A

- 3 - HINGES BB1279 4-1/2 X 4-1/2 US26D
- 1 - PASSAGE SET W/TACTILE WARNING L9010 X 803A/03 A 626
- 3 - DOOR SILENCERS
- 1 - 4111METAL (MC) EXTRA DUTY EDA ALUMINUM (TEMPLATE FOR 100 DEGREES)

HARDWARE SET 2 (STOREROOM DOORS W/DOOR CLOSER 180 DEGREES) 115B

- 3 - HINGES BB1279 4-1/2 X 4-1/2 US26D
- 1 - PASSAGE SET W/TACTILE WARNING L9010 X 803A/03 A 626
- 3 - DOOR SILENCERS
- 1 - 4111METAL (MC) EXTRA DUTY EDA ALUMINUM (TEMPLATE FOR 180 DEGREES)

HARDWARE SET 3 (OUTSIDE DOUBLE DOOR W/POWER RETRACT) 110E, E1A

- 8 - HINGES BB1191 4-1/2 X 4-1/2 (STAINLESS STEEL) US32D
- 1 - EXIT DEVICE CD99DT X 990DT X 299 (STRIKE) US26D
- 1 - ELECTRIC RETRACTION EXIT DEVICE SD-QEL-99NL X 990NL-R/V X 299 (STRIKE) US26D (MOUNTED ON SOUTH MOST DOOR)
- 1 - KEYED REMOVABLE MULLION KR4954 - 7'2 - SP28
- 1 - RIM CYLINDER 20-057 X 36-079-031 626 - C KEWAY
- 3 - MORTISE CYLINDER 20-061 626 - C KEWAY
- 1 - ELECTRONIC POWER TRANSFER EPT-2 SP28
- 1 - 4111METAL (MC) SPRING CUCH (SCUSH) ALUMINUM
- 2 - DROP PLATES 4110-18 ALUMINUM
- 1 - EXTRA HEAVY DUTY ALUMINUM THRESHOLD 425HD
- 2 - OUTSIDE DOOR SWEEPS 600A X TEKS - 36"
- 1 - 4111 METAL (MC) EXTRA DUTY EDA ALUMINUM (TEMPLATED FOR 180 DEGREES)

NOTE:

- A) PERIMETER AND MEETING STYLE WEATHERSTRIP BY ALUMINUM FRAME SUPPLIER.

SECTION 08710

DOOR HARDWARE

HARDWARE SET 4 (OUTSIDE DOUBLE DOOR) E1

8 - HINGES BB1191 4-1/2 X 4-1/2 (STAINLESS STEEL) US32D
2 - EXIT DEVICE CD99DT X 990DT X 299 (STRIKE) US26D
1 - KEYED REMOVABLE MULLION KR4954 - 7'2 - SP28
3 - MORTISE CYLINDER 20-061 626 - C KEWAY
1 - 4111METAL (MC) SPRING CUCH (SCUSH) ALUMINUM
2 - DROP PLATES 4110-18 ALUMINUM
1 - EXTRA HEAVY DUTY ALUMINUM THRESHOLD 425HD
2 - OUTSIDE DOOR SWEEPS 600A X TEKS - 36"
1 - 4111METAL (MC) EXTRA DUTY EDA ALUMINUM (TEMPLATED FOR 140 DEGREES)

NOTE:

A) PERIMETER AND MEETING STYLE WEATHERSTRIP BY ALUMINUM FRAME SUPPLIER.

HARDWARE SET 5 (OUTSIDE DOUBLE DOOR W/POWER RETRACT) E1B

8 - HINGES BB1191 4-1/2 X 4-1/2 (STAINLESS STEEL) US32D
2 - EXIT DEVICE CD99DT X 990DT X 299 (STRIKE) US26D
1 - KEYED REMOVABLE MULLION KR4954 - 7'2 - SP28
3 - MORTISE CYLINDER 20-061 626 - C KEWAY
1 - 4111METAL (MC) SPRING CUCH (SCUSH) ALUMINUM
2 - DROP PLATES 4110-18 ALUMINUM
1 - 4111METAL (MC) EXTRA DUTY EDA ALUMINUM (TEMPLATED FOR 140 DEGREES)

NOTE:

A) PERIMETER AND MEETING STYLE WEATHERSTRIP BY ALUMINUM FRAME SUPPLIER.

HARDWARE SET 6 (INSIDE DOUBLE VESTIBULE DOOR 140 DEGREES) E2A

8 - HINGES BB1191 4-1/2 X 4-1/2 (STAINLESS STEEL) US32D
1 - IVES 9103EZ-33-0 PUSH PULL COMBINATION US26D
1 - 4111METAL (MC) EXTRA DUTY EDA ALUMINUM (TEMPLATED FOR 140 DEGREES)
2 - DROP PLATES 4110-18 ALUMINUM
1 - 4111METAL (MC) EXTRA DUTY EDA ALUMINUM (TEMPLATED FOR 180 DEGREES)

NOTE:

A) PERIMETER AND MEETING STYLE WEATHERSTRIP BY ALUMINUM FRAME SUPPLIER.
B) PROVIDE NO THRESHOLD ON THIS DOOR SO WALK OFF CARPET CAN BE INSTALLED THROUGH ENTRANCE WITHOUT TRANSITION

HARDWARE SET 7 (DOUBLE DOORS W/DOOR CLOSER 140 DEGREES)

BASE BID: H200, H300

ALTERNATE BID H400

6 - HINGES BB1279 4-1/2 X 4-1/2 US26D
1 - EXIT DEVICES 99L-F-2 X 996L-03 X 499F US26D (CLASSROOM SECURITY)
2 - KICK PLATE 10" X 2" LDW B4E CTSK US32D
1 - KEYED REMOVABLE MULLION KR9954 - 7'2 - SP28
4 - RIM CYLINDERS 20-057 X 36-079-031 626 - C KEYWAY
1 - MORTISE CYLINDER 20-061 626 - C KEYWAY
2 - 4111 METAL (MC) EXTRA DUTY (EDA) ALUMINUM (TEMPLATED FOR 140 DEGRESS)
2 - DOOR SILENCERS
1 - EXIT DEVICE QEL 99L-2 X 99LL-03 X 499F US26D (CLASSROOM SECURITY)
1 - ELECTRONIC POWER TRANSFER EPT2 SP28

SECTION 08710

DOOR HARDWARE

HARDWARE SET 8 (STOREROOM DOORS W/DOOR CLOSER 100 DEGREES) 115, 200G

- 3 - HINGES BB1279 4-1/2 X 4-1/2 US26D
- 1 - STOREROOM LOCK W/TACTILE WARNING L9080R X 03A 626 - REMOVABLE CORE C KEYWAY
- 1 - KICK PLATE 10" X 2" LDW B4E CTSK US32D
- 3 - DOOR SILENCERS
- 1 - 4011 METAL (MC) ALUMINUM (TEMPLATED FOR 100 DEGREE SWING)
- 1 - ELECTRIC STRIKE 6211 US32D

HARDWARE SET 9 (STOREROOM DOORS W/NO CLOSER)

BASE BID 300WS, 200CW, 110B, 200S, 200WD, 300ED, 300ES, 200CE, 100F, 100WS, 100ES, 100W, 238A, 312A, 314A, 316A, 318A, 322A, 324A, 326A, 328A

ALTERNATE BID: 400M, 400I, 400C

- 3 - HINGES BB1279 4-1/2 X 4-1/2 US26D
- 1 - STOREROOM LOCK W/TACTILE WARNING L9080R X 03A 626 - REMOVABLE CORE C KEYWAY
- 1 - KICK PLATE 10" X 2" LDW B4E CTSK US32D
- 3 - DOOR SILENCERS
- 1 - ELECTRIC STRIKE 6211 US32D

HARDWARE SET 10 (INSIDE DOUBLE VESTIBULE DOOR 140 DEGREES)

BASE BID: E5A, E4A, E6A, E3A, E8A

ALTERNATE BID: E8A, E9A

- 8 - HINGES BB1191 4-1/2 X 4-1/2 (STAINLESS STEEL) US32D
- 2 - IVES 9103EZ-33-0 PUSH PULL COMBINATION US26D
- 2 - 4111METAL (MC) EXTRA DUTY EDA ALUMINUM (TEMPLATED FOR 140 DEGREES)
- 2 - DROP PLATES 4110-18 ALUMINUM

NOTE:

- A) PERIMETER AND MEETING STYLE WEATHERSTRIP BY ALUMINUM FRAME SUPPLIER.
- B) PROVIDE NO THRESHOLD ON THIS DOOR SO WALK OFF CARPET CAN BE INSTALLED THROUGH ENTRANCE WITHOUT TRANSITION

HARDWARE SET 11 (OUTSIDE SINGLE DOOR W/ELECTRIC STRIKE 180 DEGREES) 115D, 115E, 300EDA

- 4 - HINGES BB1191 4-1/2 X 4-1/2 (STAINLESS STEEL) US32D
- 1 - STOREROOM LOCK L9080R X 03A 626 - - - REMOVABLE CORE C KEYWAY
- 1 - 4111 METAL (MC) EXTRA DUTY (EDA) ALUMINUM (TEMPLATED FOR 180 DEGRESS)
- 1 - EXTRA HEAVY DUTY ALUMINUM THRESHOLD 425HD
- 1 - OUTSIDE DOOR SWEEPS 600A X TEKS - 36"
- 1 - ELECTRIC SRIKE 6211 US32D

NOTE:

- A) PERIMETER AND MEETING STYLE WEATHERSTRIP BY ALUMINUM FRAME SUPPLIER.

SECTION 08710

DOOR HARDWARE

HARDWARE SET 12 (CLASSROOM DOORS W/NO DOOR CLOSER)

BASE BID:

202, 204, 206, 208, 212, 214, 216, 218, 222, 224, 226, 228, 232, 234, 236, 238, 205, 207, 209, 211, 215, 217, 219, 221, 223, 225, 231A, 231B, 306, 306A, 308, 308A, 312, 314, 316, 318, 322, 324, 326, 328, 305, 307, 309 311, 313, 101, 102, 103, 104, 104A, 105, 107, 108, 109, 109A, 109C, 106, 106A, 100A, 120A, 120B, 110A, 100B,

ALTERNATE BID:

400, 400A, 401, 401A, 401B, 402, 404, 403, 405, 407, 409, 406, 408, 410, 411, 412, 413

- 3 - HINGES BB1279 4-1/2 X 4-1/2 US26D
- 1 - CLASSROOM SECURITY LOCK L9071R X 03A 626 - - REMOVABLE CORE C KEYWAY
- 1 - WALL STOP 403 US26D
- 1 - KICK PLATE 10" X 2" LDW B4E CTSK US32D
- 3 - DOOR SILENCERS
- 1 - ELECTRIC STRIKE 6211 US32D

HARDWARE SET 13 (CLASSROOM DOOR W/DOOR CLOSER 100 DEGREES) 100

- 3 - HINGES BB1279 4-1/2 X 4-1/2 US26D
- 1 - CLASSROOM SECURITY LOCK L9071R X 03A 626 - - REMOVABLE CORE C KEYWAY
- 1 - KICK PLATE 10" X 2" LDW B4E CTSK US32D
- 3 - DOOR SILENCERS
- 1 - 4011 METAL (MC) ALUMINUM (TEMPLATED FOR 100 DEGREE SWING)
- 1 - ELECTRIC STRIKE 6211 US32D

HARDWARE SET 14 (CLOSET DOOR)

BASE BID: 230A, 220A, 210A, 200A, 320A, 310A

ALTERNATE BID: 400W

- 6 - HINGES BB1279 4-1/2 X 4-1/2 US26D
- 1 - ELECTRONIC POWER TRANSFER EPT-2 SP28
- 2 - DOOR SILENCERS
- 1 - SURFACE BOLT IVES SB 453TB26D8 (MOUNTED ON TOP BOLT LATCH MOUNTED ON FRAME LEFT DOOR)
- 1 - STOREROOM LOCK W/TACTILE WARNING L9080R X 803A/03A 626 - REMOVEABLE CORE C KEYWAY
- 1 - ELECTRIC STRIKE 6211 US32D

HARDWARE SET 15 (DOUBLE DOORS W/DOOR CLOSER 100 DEGREES) 110, 110D

- 6 - HINGES BB1279 4-1/2 X 4-1/2 US26D
- 1 - EXIT DEVICES 99L-2 X 996L-03 X 499F US26D (CLASSROOM SECURITY)
- 2 - KICK PLATE 10" X 2" LDW B4E CTSK US32D
- 1 - KEYED REMOVABLE MULLION KR9954 - 7'2 - SP28
- 4 - RIM CYLINDERS 20-057 X 36-079-031 626 - C KEYWAY
- 1 - MORTISE CYLINDER 20-061 626 - C KEYWAY
- 1 - 4111 METAL (MC) EXTRA DUTY (EDA) ALUMINUM (TEMPLATED FOR 100 DEGREES)
- 2 - DOOR SILENCERS
- 1 - EXIT DEVICE QEL 99L-2 X 996LT03 X 499F US26D (CLASSROOM SECURITY)
- 1 - ELECTRONIC POWER TRANSFER EPT-2 SP28
- 1 - 4111 METAL (MC) EXTRA DUTY (EDA) ALUMINUM (TEMPLATED FOR 180 DEGREES)

SECTION 08710

DOOR HARDWARE

HARDWARE SET 16 (WASHROOM DOOR W/NO DOOR CLOSER)

BASE BID: 202B, 204B, 206B, 208B, 200NS, 200SS, 300NS, 300SS, 100S, 109B,

ALTERNATE BID: 400NS, 400SS, 400B, 402B, 404B, 406B, 408B, 410B, 412B, 411B, 413B

3 - HINGES BB1279 4-1/2 X 4-1/2 US26D

1 - PRIVACY LOCK L9496R X 03A 626 - REMOVABLE CORE C KEYWAY

1 - WALL STOP 403 US26D

1 - KICK PLATE 10" X 2" LDW B4E CTSK US32D

3 - DOOR SILENCERS

HARDWARE SET 17 (PIPE CHASE DOOR)

BASE BID: 202C, 206C, 208C, H100A, H100B, 305A, 300WSA, H200M, 100ESA

ALTERNATE BID: 400D, 402C, 406C, 410C, 412C, 411C, 413C

3 - HINGES BB1279 4-1/2 X 4-1/2 US26D

1 - DEADBOLT LOCK L9464 626 - REMOVABLE CORE C KEYWAY

1 - EXTRA HEAVY DUTY ALUMINUM THRESHOLD 425HD

3 - DOOR SILENCERS

HARDWARE SET 18 (DOUBLE DOORS W/DOOR CLOSER 100 DEGREES) 231, 231C, 120C

6 - HINGES BB1279 4-1/2 X 4-1/2 US26D

1 - EXIT DEVICE 99L-2 X 996L-03 X 499F US26D (CLASSROOM SECURITY)

2 - KICK PLATE 10" X 2" LDW B4E CTSK US32D

1 - KEYED REMOVABLE MULLION KR9954 - 7'2 - SP28

4 - RIM CYLINDERS 20-057 X 36-079-031 626 - C KEYWAY

1 - MORTISE CYLINDER 20-061 626 - C KEYWAY

2 - 4111 METAL (MC) EXTRA DUTY (EDA) ALUMINUM (TEMPLATED FOR 100 DEGRESS)

2 - DOOR SILENCERS

1 - EXIT DEVICE QEL 99L-2 X 996L-03 X 499F US26D (CLASSROOM SECURITY)

1 - ELECTRONIC POWER TRANSFER EPT-2 SP28

HARDWARE SET 19 (OUTSIDE SINGLE DOOR 180 DEGREES) 115C

4 - HINGES BB1191 4-1/2 X 4-1/2 (STAINLESS STEEL) US32D

1 - STOREROOM LOCK L9080R X 03A 626 - - REMOVABLE CORE C KEYWAY

1 - 4111 METAL (MC) EXTRA DUTY (EDA) ALUMINUM (TEMPLATED FOR 180 DEGRESS)

1 - EXTRA HEAVY DUTY ALUMINUM THRESHOLD 425HD

1 - OUTSIDE DOOR SWEEPS 600A X TEKS - 36"

NOTE:

A) PERIMETER AND MEETING STYLE WEATHERSTRIP BY ALUMINUM FRAME SUPPLIER.

HARDWARE SET 20 (OUTSIDE DOUBLE DOOR W/POWER RETRACT 140/180 DEGREES) E4, E5, E6, E2, E8, E7

8 - HINGES BB1191 4-1/2 X 4-1/2 (STAINLESS STEEL) US32D

1 - EXIT DEVICE CD99DT X 990DT X 299 (STRIKE) US26D

1 - ELECTRIC RETRACTION EXIT DEVICE SD-QEL-99NL X 990NL-R/V X 299 (STRIKE) US26D (MOUNTED ON RIGHT DOOR WHEN FACING DOOR FROM EXTERIOR)

1 - KEYED REMOVABLE MULLION KR4954 - 7'2 - SP28

1 - RIM CYLINDER 20-057 X 36-079-031 626 - C KEWAY

3 - MORTISE CYLINDER 20-061 626 - C KEWAY

1 - ELECTRONIC POWER TRANSFER EPT-2 SP28

2 - DROP PLATES 4110-18 ALUMINUM

1 - EXTRA HEAVY DUTY ALUMINUM THRESHOLD 425HD

SECTION 08710

DOOR HARDWARE

- 2 - OUTSIDE DOOR SWEEPS 600A X TEKS - 36"
- 1 - 4111 METAL (MC) EXTRA DUTY EDA ALUMINUM (TEMPLATED FOR 140 DEGREES)
- 1 - 4111 METAL (MC) EXTRA DUTY EDA ALUMINUM (TEMPLATED FOR 180 DEGREES)

NOTE:

- A) PERIMETER AND MEETING STYLE WEATHERSTRIP BY ALUMINUM FRAME SUPPLIER.

HARDWARE SET 21 (OUTSIDE DOUBLE DOOR W/POWER RETRACT 180 DEGREES)

BASE BID: E3

ALTERNATE BID: E8, E9, E12

- 8 - HINGES BB1191 4-1/2 X 4-1/2 (STAINLESS STEEL) US32D
- 1 - EXIT DEVICE CD99DT X 990DT X 299 (STRIKE) US26D
- 1 - ELECTRIC RETRACTION EXIT DEVICE SD-QEL-99NL X 990NL-R/V X 299 (STRIKE) US26D
(MOUNTED ON RIGHT DOOR WHEN FACING DOORS FROM EXTERIOR)
- 1 - KEYED REMOVABLE MULLION KR4954 - 7'2 - SP28
- 1 - RIM CYLINDER 20-057 X 36-079-031 626 - C KEWAY
- 3 - MORTISE CYLINDER 20-061 626 - C KEWAY
- 1 - ELECTRONIC POWER TRANSFER EPT-2 SP28
- 2 - 4111METAL (MC) EXTRA DUTY EDA ALUMINUM (TEMPLATED FOR 180 DEGREES)
- 2 - DROP PLATES 4110-18 ALUMINUM
- 1 - EXTRA HEAVY DUTY ALUMINUM THRESHOLD 425HD
- 2 - OUTSIDE DOOR SWEEPS 600A X TEKS-36"

NOTE:

- A) PERIMETER AND MEETING STYLE WEATHERSTRIP BY ALUMINUM FRAME SUPPLIER.

HARDWARE SET 22 (OUTSIDE SINGLE DOOR W/ELECTRIC STRIKE)

ALTERNATE BID: 401C, H400S

- 4 - HINGES BB1191 4-1/2 X 4-1/2 (STAINLESS STEEL)
- 1 - EXIT DEVICE CD99NL X 990NL-R/V X 299 (STRIKE) US26D
- 1 - 4111 METAL (MC) EXTRA DUTY EDA ALUMINUM TEMPLATE FOR 180 DEGREES
- 1 - EXTRA HEAVY DUTY ALUMINUM THRESHOLD 425HD
- 1 - OUTSIDE DOOR SWEEPS 600A X TEKS - 36"
- 1 - HES ELECTRIC STRIKE 9600-12/24-630
- 1 - DROP PLATE 4110-18 ALUMINUM
- 1 - RIM CYLINDER 20-057 X 36-079-031 626-CKEYWAY
- 1 - MORTISE CYLINDER 20-061 626-CKEYWAY

NOTE: A) PERIMETER AND MEETING STYLE WEATHERSTRIP BY ALUMINUM DOOR SUPPLIER.

HARDWARE SET 23 (DOUBLE DOORS W/DOOR CLOSER 140 DEGREES) H100S, H100M

- 6 - HINGES BB1279 4-1/2 X 4-1/2 US26D
- 1 - EXIT DEVICES 99L-2 X 996L-03 X 499F US26D (CLASSROOM SECURITY)
- 2 - KICK PLATE 10" X 2" LDW B4E CTSK US32D
- 1 - KEYED REMOVABLE MULLION KR9954 - 7'2 - SP28
- 4 - RIM CYLINDERS 20-057 X 36-079-031 626 - C KEYWAY
- 1 - MORTISE CYLINDER 20-061 626 - C KEYWAY
- 2 - 4111 METAL (MC) EXTRA DUTY (EDA) ALUMINUM (TEMPLATED FOR 140 DEGRESS)
- 2 - DOOR SILENCERS
- 1 - EXIT DEVICE QEL 99L-2 X 996L-03 X 499F US26D (CLASSROOM SECURITY)
- 1 - ELECTRONIC POWER TRANSFER EPT-2 SP28

SECTION 08710

DOOR HARDWARE

HARDWARE SET 24 (PTO KITCHEN PASS THROUGH WINDOW) 110C

4 - HINGES BB1279 4-1/2 X 4-1/2 US26D
 1 - STOREROOM LOCK L9080 X 03A LESS OUTSIDE TRIM
 2 - 4111 METAL (MC) EXTRA DUTY (EDA) ALUMINUM (TEMPLATED FOR 180 DEGREE SWING)
 1 - AUTOMATIC FLUSH BOLT FB42 US32D
 1 - BAR COORDINATOR COR32 US26D
 2 - DOOR SILENCERS
 1-SURFACE BOLT IVES SB 453TB26D MOUNTED ON TOP BOLT LATCH MOUNTED ON FRAME
 (SOUTH DOOR)

HARDWARE SET 25 (100GDA)

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1HW 4.5 X 4.5	630	IVE
1	EA	MULT PT STOREROOM	LM9380T 03A	626	SCH
1	EA	SURFACE CLOSER	4111 METAL (MC) EXTRA DUTY (EDA) ALUMINUM (TEMPLATED FOR 180 DEGREE SWING)	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	RAIN DRIP	142AA	AA	ZER
1	SET	GASKETING	328AA-S JAMB SEAL SET	AA	ZER
1	EA	GASKETING	429AA HEAD SEAL MOUNT PRIOR TO ANY HEAD MOUNTED HARDWARE	AA	ZER
1	EA	DOOR SWEEP	39A	A	ZER
1	EA	THRESHOLD	566A-V3-223	A	ZER

HARDWARE SET 26 (120D and 120E)

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
6	EA	HINGE	5BB1HW 4.5 X 4.5 NRP	630	IVE
2	EA	POWER TRANSFER	EPT10 CON	689	VON
1	EA	ELEC PANIC HARDWARE	QEL-WS-9927-EO-CON 24 VDC RHR - WILL USE 990NL LISTED IN SEPERATE LINE	626	VON
1	EA	PANIC HARDWARE	WS-9927-EO- LHR	626	VON
1	EA	TRIM	990-NL-RV RHR	626	VON
2	EA	ROD AND LATCH GUARD	WS-LGO-3-	US32D	VON
1	EA	RIM CYLINDER	20-057 C (VERIFY AND MATCH EXISTING)	626	SCH
2	EA	SURFACE CLOSER	4111 METAL (MC) EXTRA DUTY (EDA) ALUMINUM (TEMPLATED FOR 180 DEGREE SWING)	689	LCN
1	SET	MEETING STILE	328AA-S	AA	ZER

SECTION 08710

DOOR HARDWARE

1	SET	GASKETING	328AA-S JAMB SEAL SET	AA	ZER
1	EA	GASKETING	429AA HEAD SEAL MOUNT PRIOR TO ANY HEAD MOUNTED HARDWARE	AA	ZER
2	EA	DOOR SWEEP	39A	A	ZER
1	EA	THRESHOLD	566A-V3-223	A	ZER

Provide each PR door(s) with the following:

CREDENTIAL READER DEVICE IS TO RETRACT LATCHES ALLOWING MANUAL INGRESS. IMMEDIATE EGRESS IS ALWAYS AVAILABLE. KEYED INGRESS IS ALSO AVAILABLE.

ITEMS TO BE PROVIDED BY THE DIVISION 16 SUPPLIER:

CREDENTIAL READER DEVICE.

REQUIRED WIRING TO THE PS902 POWER SUPPLY (WHICH POWERS THE QEL ELECTRIC LATCH RETRACTION FEATURE INSIDE THE PANIC HARDWARE), THE QEL ELECTRIC LATCH RETRACTION FEATURE INSIDE THE PANIC HARDWARE ITS SELF.

HARDWARE SET 27 (120 and 120F)

Provide each PR door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
6	EA	HINGE	5BB1HW 4.5 X 4.5 NRP	652	IVE
1	EA	POWER TRANSFER	EPT10 CON RHR	689	VON
1	EA	ELEC FIRE EXIT HARDWARE	QEL-WS-9927-L-F-03-CON 24 VDC RHR	626	VON
1	EA	FIRE EXIT HARDWARE	WS-9927-L-F-03 LHR	626	VON
2	EA	ROD AND LATCH GUARD	WS-LGO-3-	US32D	VON
2	EA	RIM CYLINDER	20-057 C (VERIFY AND MATCH EXISTING)	626	SCH
2	EA	SURFACE CLOSER	4111 METAL (MC) EXTRA DUTY (EDA) ALUMINUM (TEMPLATED FOR 100 DEGREE SWING)	689	LCN
2	EA	MAGNET	SEM7830 12V/24V/120V AS REQ.	689	LCN
1	EA	GASKETING	188SBK PSA	BK	ZER
1	SET	MEETING STILE	328AA-S	AA	ZER

CREDENTIAL READER DEVICE IS TO RETRACT LATCH ALLOWING MANUAL INGRESS. IMMEDIATE EGRESS IS ALWAYS AVAILABLE. KEYED INGRESS IS ALSO AVAILABLE.

MAG HOLD OPENS ARE TO BE TIED DIRECTLY TO THE FIRE ALARM SYSTEM.

ITEMS TO BE PROVIDED BY THE DIVISION 16 SUPPLIER:

REQUIRED WIRING TO THE PS902 POWER SUPPLY (WHICH POWERS THE QEL ELECTRIC LATCH RETRACTION FEATURE INSIDE THE PANIC HARDWARE), THE QEL ELECTRIC LATCH RETRACTION FEATURE INSIDE THE PANIC HARDWARE ITS SELF.

SECTION 08710

DOOR HARDWARE

HARDWARE SET 28 (CLOSET DOOR)

BASE BID: 230B, 220B, 210B, 200B, 320B, 310B

ALTERNATE BID: 400WA

- 6 - HINGES BB1279 4-1/2 X 4-1/2 US26D
- 1 - ELECTRONIC POWER TRANSFER EPT-2 SP28
- 2 - DOOR SILENCERS
- 1 - SURFACE BOLT IVES SB 453TB26D8 (MOUNTED ON TOP BOLT LATCH MOUNTED ON FRAME LEFT DOOR)
- 1 - CLASSROOM LOCK W/TACTILE WARNING L9070R X 803A/03A 626 - REMOVEABLE CORE C KEYWAY
- 1 - ELECTRIC STRIKE 6211 US32D

HARDWARE SET 29 (SINGLE CLOSET DOORS W/NO CLOSER)

BASE BID 202A, 204A, 206A, 208A, 212A, 214A, 216A, 218A, 222A, 224A, 226A, 228A, 232A, 234A, 236A, 238A, 312A, 314A, 316A, 318A, 322A, 324A, 326A, 328A

ALTERNATE BID: 402A, 404A, 406A, 408A, 410A, 411A, 412A, 413A

- 3 - HINGES BB1279 4-1/2 X 4-1/2 US26D
- 1 - CLASSROOM LOCK W/TACTILE WARNING L9070R X 03A 626 - REMOVABLE CORE C KEYWAY
- 1 - KICK PLATE 10" X 2" LDW B4E CTSK US32D
- 3 - DOOR SILENCERS

HARDWARE SET 30 (INSIDE DOUBLE VESTIBULE DOOR 180 DEGREES)

BASE BID: E7A

- 8 - HINGES BB1191 4-1/2 X 4-1/2 (STAINLESS STEEL) US32D
- 2 - IVES 9103EZ-33-0 PUSH PULL COMBINATION US26D
- 1 - 4111METAL (MC) EXTRA DUTY EDA ALUMINUM (TEMPLATED FOR 140 DEGREES)
- 2 - DROP PLATES 4110-18 ALUMINUM
- 1 - 4111METAL (MC) EXTRA DUTY EDA ALUMINUM (TEMPLATED FOR 180 DEGREES)

NOTE:

- A) PERIMETER AND MEETING STYLE WEATHERSTRIP BY ALUMINUM FRAME SUPPLIER.
- B) PROVIDE NO THRESHOLD ON THIS DOOR SO WALK OFF CARPET CAN BE INSTALLED THROUGH ENTRANCE WITHOUT TRANSITION

HARDWARE SET 31 (OUTSIDE DOUBLE DOOR W/POWER RETRACT) E1C

- 8 - HINGES BB1191 4-1/2 X 4-1/2 (STAINLESS STEEL) US32D
- 1 - EXIT DEVICE CD99DT X 990DT X 299 (STRIKE) US26D
- 1 - ELECTRIC RETRACTION EXIT DEVICE SD-QEL-99NL X 990NL-R/V X 299 (STRIKE) US26D (MOUNTED ON SOUTH MOST DOOR)
- 1 - KEYED REMOVABLE MULLION KR4954 - 7'2 - SP28
- 1 - RIM CYLINDER 20-057 X 36-079-031 626 - C KEWAY
- 3 - MORTISE CYLINDER 20-061 626 - C KEWAY
- 1 - ELECTRONIC POWER TRANSFER EPT-2 SP28
- 1 - 4111METAL (MC) SPRING CUCH (SCUSH) ALUMINUM
- 2 - DROP PLATES 4110-18 ALUMINUM
- 1 - EXTRA HEAVY DUTY ALUMINUM THRESHOLD 425HD
- 2 - OUTSIDE DOOR SWEEPS 600A X TEKS - 36"
- 1 - 4111 METAL (MC) EXTRA DUTY EDA ALUMINUM (TEMPLATED FOR 180 DEGREES)

NOTE:

SECTION 08710

DOOR HARDWARE

- A) PERIMETER AND MEETING STYLE WEATHERSTRIP BY ALUMINUM FRAME SUPPLIER.
- B) PROVIDE NO THRESHOLD ON THIS DOOR SO WALK OFF CARPET CAN BE INSTALLED THROUGH ENTRANCE WITHOUT TRANSITION

END OF SECTION

SECTION 08800

GLAZING

PART 1 – GENERAL

1.1 SECTION INCLUDES

- A. Glass and plastic glazing.
- B. Glazing compounds and accessories.

1.2 RELATED SECTIONS

- A. Section 07900 - Joint Sealers: Sealant and back-up material.
- B. Section 08110 - Steel Doors and Frames
- C. Section 08410 - Metal-Framed Storefronts.

1.3 REFERENCES

- A. ANSI Z97.1 - American National Standard for Safety Glazing Materials Used in Buildings, Safety Performance Specifications and Methods of Test; 1984 (R1994).
- B. ASTM C 864 - Standard Specification for Dense Elastomeric Compression Seal Gaskets, Setting Blocks, and Spacers; 1999.
- C. ASTM C 920 - Standard Specification for Elastomeric Joint Sealants; 2002.
- D. ASTM C 1036 - Standard Specification for Flat Glass; 2001.
- E. ASTM C 1048 - Standard Specification for Heat-Treated Flat Glass--Kind HS, Kind FT Coated and Uncoated Glass; 1997b.
- F. ASTM C 1193 - Standard Guide for Use of Joint Sealants; 2000.
- G. GANA (GM) - GANA Glazing Manual; Glass Association of North America; 1997.
- H. GANA (SM) - FGMA Sealant Manual; Glass Association of North America; 1990.

1.4 PERFORMANCE REQUIREMENTS

- A. Provide glass and glazing materials for continuity of building enclosure vapor retarder and air barrier:
 - 1. In conjunction with materials described in Section 07260 and 07900.
 - 2. To utilize the inner pane of multiple pane sealed units for the continuity of the air barrier and vapor retarder seal.
 - 3. To maintain a continuous air barrier and vapor retarder throughout the glazed assembly from glass pane to heel bead of glazing sealant.

1.5 SUBMITTALS

- A. See Section 01300 - Administrative Requirements, for submittal procedures.
- B. Product Data on Glass Types: Provide structural, physical and environmental characteristics, size limitations, and special handling or installation requirements.
- C. Product Data on Glazing Compounds: Provide chemical, functional, and environmental characteristics, limitations, special application requirements. Identify available colors.
- D. Samples: Submit two samples 12 x 12 inch in size of glass units.
- E. Certificates: Certify that products meet or exceed specified requirements.
- F. Manufacturer's Certificate: Certify that sealed insulated glass meets or exceeds specified requirements.

1.6 QUALITY ASSURANCE

- A. Perform Work in accordance with GANA Glazing Manual and FGMA Sealant Manual for glazing installation methods. Maintain one copy on site.
- B. Installer Qualifications: Company specializing in performing the work of this section with minimum five years documented experience.

1.7 PRE-INSTALLATION MEETING

- A. Convene one week before starting work of this section.

SECTION 08800

GLAZING

1.8 ENVIRONMENTAL REQUIREMENTS

- A. Do not install glazing when ambient temperature is less than 50 degrees F.
- B. Maintain minimum ambient temperature before, during and 24 hours after installation of glazing compounds.

1.9 WARRANTY

- A. See Section 01780 - Closeout Submittals, for additional warranty requirements.
- B. Provide a five year warranty to include coverage for sealed glass units from seal failure, interpane dusting or misting, and replacement of same.

PART 2 – PRODUCTS

2.1 FLAT GLASS MATERIALS

- A. Manufacturers:
 1. Oldcastle Building Envelope (www.obe.com)
 2. Guardian Industries Corporation: www.guardian.com.
 3. Pilkington Building Products North America: www.pilkington.com.
 4. Visteon Glass Systems: www.visteon.com
 5. Substitutions: Refer to Section 01600 - Product Requirements.
- B. **Interior Vision Glass (Type I-1):** (1/4" tempered clear)
 1. Comply with ASTM C 1036, Type I, transparent flat, Class 1 clear, Quality Q3 (glazing select) and ASTM C 1048.
 2. Comply with ANSI Z97.1.
- C. **Fire-Rated Vision Glass (Type F-1):** Clear; Safety-rated Glass Ceramic with Surface-Applied Film.
 1. Thickness: 3/16" Min.
 2. Grade: Premium Grade Clear Viewing
 3. Rating: Provide rating as required for associated door or frame construction, unless otherwise noted – refer to drawings.
 4. Manufactured by:
 - a. Technical Glass Products
 - b. Vetrotech Saint-Gobain North America.
 - c. Safti First Fire Rated Glazing Solutions.
 - d. Approved Equal.
- D. **Exterior Glass (Type E-1):** 1" Insulated Unit = (1/4" tempered clear) x (1/2" argon filled a.s.) x (1/4" tempered clear with Solarban 60 on the #2 surface).
- E. **Exterior Glass (Type E-2):** 1 1/8" Insulated Unit = (1/4" tempered clear) x (1/2" argon filled a.s.) x (1/8" clear annealed laminate glass, 0.90" laminate, 1/8" clear annealed glass with Solarban 60 on the #3 surface).
 1. Laminate: .09" Saflex Clear PVB interlay or approved equal.
- F. **Exterior Spandrel Panel (Type S-1):** 1" Insulated Spandrel Glass (design intent is for glass to read the same at E-1, but not transparent).

2.2 GLAZING COMPOUNDS

- A. Manufacturers:
 1. Dow Corning Corp: www.dowcorning.com
 2. GE Plastics: www.geplastics.com
 3. Pecora Corporation: www.Pecora.com
 4. Substitutions: Refer to Section 01600 - Product Requirements.
- B. Silicone Sealant: Single component; chemical curing; capable of water immersion without loss of properties; non-bleeding, non-staining; ASTM C 920, Type S, Grade NS, Class 25, Uses M, A, and G; cured Shore A hardness of 15 to 25; color as selected.

SECTION 08800

GLAZING

2.3 GLAZING ACCESSORIES

- A. Setting Blocks: Neoprene, 80 to 90 Shore A durometer hardness, ASTM C 864 Option I. Length of 0.1 inch for each square foot of glazing or minimum 4 inch x width of glazing rabbet space minus 1/16 inch x height to suit glazing method and pane weight and area.
- B. Spacer Shims: Neoprene, 50 to 60 Shore A durometer hardness, ASTM C 864 Option I. Minimum 6 inch long x one half the height of the glazing stop x thickness to suit application, self adhesive on one face.
- C. Glazing Tape: Preformed butyl compound with integral resilient tube spacing device; 10 to 15 Shore A durometer hardness; coiled on release paper; 3/8 inch size; black color.

PART 3 – EXECUTION

3.1 EXAMINATION

- A. Verify that openings for glazing are correctly sized and within tolerance.
- B. Verify that surfaces of glazing channels or recesses are clean, free of obstructions that may impede moisture movement, weeps are clear, and ready to receive glazing.

3.2 PREPARATION

- A. Clean contact surfaces with solvent and wipe dry.
- B. Install sealants in accordance with ASTM C 1193 and FGMA Sealant Manual.

3.3 INSTALLATION - INTERIOR DRY METHOD (TAPE AND TAPE)

- A. Cut glazing tape to length and set against permanent stops, projecting 1/16 inch (1.6 mm) above sight line.
- B. Place setting blocks at 1/4 points with edge block no more than 6 inches from corners.
- C. Rest glazing on setting blocks and push against tape for full contact at perimeter of pane or unit.
- D. Place glazing tape on free perimeter of glazing in same manner described above.
- E. Install removable stop without displacement of tape. Exert pressure on tape for full continuous contact.
- F. Knife trim protruding tape.

3.4 CLEANING

- A. Remove glazing materials from finish surfaces.
- B. Remove labels after Work is complete.
- C. Clean glass and adjacent surfaces.

3.5 PROTECTION OF FINISHED WORK

- A. After installation, mark pane with an 'X' by using removable plastic tape or paste.

END OF SECTION

SECTION 08900

ALUMINUM LOUVERS

PART 1 – GENERAL

1.1 SECTION INCLUDES

- A. Aluminum louvers as shown on the Drawings and as specified herein, including but not necessarily limited to the following:
 - 1. Continuous blade type, architectural vision louvers.
 - 2. Concealed snap-in support clips and accessories.
 - 3. Factory-applied finish system to louver blades.
 - 4. Field measurements and verification of all openings and all conditions of the louver installations.

1.2 RELATED SECTIONS

- A. Section 051200 - Structural Steel: Metal Framing.
- B. Section 055000 - Metal Fabrications: Frames and supports.
- C. Section 099100 - Paints and Coatings: Field applied paint finish.
- D. Section 108213 – Exterior Grilles & Screens.

1.3 REFERENCES

- A. AAMA 2605 - Voluntary Specification, Performance Requirements and Test Procedures for Superior Performing Organic Coatings on Aluminum Extrusions and Panels.
- B. ASCE 7 - Minimum Design Loads for Buildings and Other Structures.
- C. ASTM B 221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes.
- D. ASTM B 449 - Standard Specification for Chromates on Aluminum.
- E. ASTM D 1730 - Standard Practices for Preparation of Aluminum and Aluminum-Alloy Surfaces for Painting.
- F. ASTM D 2244 - Standard Practice for Calculation of Color Tolerances and Color Differences from Instrumentally Measured Color Coordinates.
- G. ASTM D 4214 - Standard Test Methods for Evaluating the Degree of Chalking of Exterior Paint Films.

1.4 COORDINATION

- A. Coordinate Work with other operations and installation of roofing materials to avoid damage to installed insulation and membrane materials.

1.5 ACTION SUBMITTALS

- A. Submit the following in accordance with Section 01 33 00:
- B. Product Data: Manufacturer's data sheets on each product to be used, including:
 - 1. Preparation instructions and recommendations.
 - 2. Load tables showing louver span capacities.
 - 3. Storage and handling requirements and recommendations.
 - 4. Installation methods.
- C. Shop Drawings:
 - 1. Layout and erection drawings showing typical cross sections and dimensioned locations of all louver blades, trees, splices and corners. Include erection drawings, elevations, and details where applicable.
- D. Selection Samples:
 - 1. For each finish product specified, two complete sets of color chips representing manufacturer's full range of available colors and patterns.
- E. Verification Samples:
 - 1. For each product specified, two samples, minimum 12 inches (305 mm) long, representing actual product shape and dimensions.

SECTION 08900

ALUMINUM LOUVERS

1.6 INFORMATIONAL SUBMITTALS

- A. Manufacturer's Certificates: Certify products meet or exceed specified requirements.
- B. Warranties: 3 signed copies of the following:
 - 1. Louver Units including paint finish.

1.7 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Manufacturer with a minimum five years documented experience in producing architectural louver systems.
- B. Provide aluminum louvers by a firm having undivided responsibility for the entire aluminum louver system design, fabrication and installation, except as otherwise specified herein.
- C. Provide aluminum louvers in strict accordance with state and local building codes and ordinances and conforming to applicable wind load factors relative to framing and anchorage.
- D. Pre-Installation Meeting:
 - 1. Convene at job site, at least seven calendar days prior to scheduled beginning of construction activities of this section, to review requirements of this section.
 - 2. Require attendance by representatives of the installing subcontractor (who will represent the system manufacturer), the mechanical subcontractors and other entities affected by construction activities of this section.
 - 3. Notify Architect four calendar days in advance of scheduled meeting date.
- E. Mock-Up: Provide a mock-up for evaluation of surface preparation techniques and application workmanship.
 - 1. Locate in area designated by Architect.
 - 2. Construct mock-up, one section of louvers at full height and supported on each end by support member matching those being used in the system design.
 - 3. Do not proceed with remaining work until workmanship, color, and location is approved by Architect.
 - 4. Remove mock-up if required by Architect.
 - 5. Accepted mock-up may remain in place.
- F. Provide factory-applied finish aluminum system in accordance with AAMA 2605 for Superior Performance Organic Coatings on Architectural Extrusions and Panels.

1.8 DELIVERY, HANDLING AND STORAGE

- A. Deliver louver components to the project site clearly marked for proper identification.
- B. Receive, handle and store materials in conformance with the manufacturers printed instructions.
- C. Store louver components in accordance with manufacturer's instructions, above ground, in dunnage and protected from weather, construction activities and other causes of damage or loss.
- D. Handling: Use a forklift or crane to move material. Do not lift the bundles by the metal bands.
 - 1. Fork Lift: Spread the forks as far as possible to balance the load. Drive slowly when moving long bundles over uneven surfaces to avoid tipping the load
 - 2. Crane: Position the canvas sling straps so that the space between the straps is at least 1/3 the length of the bundle. Use sling straps with looped ends running one end of the strap through the loop at the other end to cinch the bundle when lifted. When setting the load on the roof, put wood blocks under it to protect the roof and allow space to remove the sling straps.
 - 3. Roof Placement: Spread the bundles and crates out as much as possible to avoid overloading the roof structure. Place the material directly over major supports such as beams or trusses.

SECTION 08900

ALUMINUM LOUVERS

1.9 PROJECT CONDITIONS

- A. Field Measurements: Verify louver openings by field measurements before fabrication and indicate measurements on Shop Drawings. Coordinate fabrication schedule with construction progress to avoid delaying the Work.
 - 1. Established Dimensions: Where field measurements cannot be made without delaying the Work, establish dimensions and proceed with fabricating louvers without field measurements. Coordinate construction to ensure that actual dimensions correspond to established dimensions.

1.10 WARRANTY

- A. Louvers:
 - 1. Provide written warranty, stating that the louvers, exclusive of paint finish, will be free of faults and defects for a period of twenty (20) years.
 - 2. Provide warranty signed by the louver manufacturer and installing contractor.
- B. Paint Finish:
 - 1. Provide written warranty stating that the paint finish applied on all louver components will retain its film integrity, color and chalk as defined by AAMA 2605 for a period of ten (10) years.
 - 2. Provide warranty signed by the louver manufacturer and paint finish applicator (if separate from manufacturer).
- C. The above warranties are in addition to, and not a limitation of, other rights the Owner may under the Contract Documents.

PART 2 – PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Design Loads: Comply with Building Code for site location and building height.
 - 1. Design to resist ASCE 7 - Minimum Design Loads for Buildings and Other Structures, using the latest published ASCE version.
 - 2. Design all materials, assembly and attachments to resist snow, wind, suction and uplift loading at any point without damage or permanent set.
- B. Structural Design: Prepare structural design calculations for louver assemblies including blades, clips, trees, fasteners and attachment to structure.
 - 1. Design and provide louvers to withstand a wind load of [x] psf inward and [x] psf outward with a deflection in both vertical and horizontal members not to exceed L/180.
- C. Thermal Movement: Normal thermal movement is defined as that resulting from a 120 degrees F maximum change (range) in ambient temperature. Base design calculations on actual surface temperatures of metals due to both solar heat gain and night time sky heat loss.
- D. Anchors and Connections:
 - 1. Anchors, connections and assemblies connecting the louvers and associated fabrications to the supporting construction are shown on the Drawings as suggested locations for the louver manufacturer/installer's information. The louver manufacturer/installer is responsible for the structural design and placement of the connections and anchors, including all connecting hardware, accessories and reinforcing necessary for fabrication, and installation of the louvers and associated fabrications.
 - 2. The louver manufacturer is to notify the Architect in writing prior to the submittal of shop drawings of any changes in the proposed locations of connections and anchors.
 - 3. The Architect's review of shop drawings is not to be construed as removing responsibility from the louver manufacturer/installer for structural failures related to design, fabrication, installation, and fabrication services.

SECTION 08900

ALUMINUM LOUVERS

2.2 MANUFACTURERS

- A. Basis of Design: RoofScreen Mfg., which is located at: 347 Coral St. ; Santa Cruz, CA 95060; Toll Free Tel: 866-766-3727; Tel: 831-421-9230; Fax: 866-253-0738; Email: request info (info@roofscreen.com); Web: www.roofscreen.com.
- B. Substitutions: See Section 01600 – Product Requirements

2.3 PRODUCTS

- A. Basis-of-Design Manufacturer and Louver: RoofScreen Mfg.
 - 1. VisionGuard L10 Angled Louver.
 - 2. Substitutions: Refer to Section 01600 - Product Requirements.

2.4 MATERIALS

- A. Aluminum Extrusions: ASTM B 221, 6063-T6 alloy and temper.
- B. Fasteners:
 - 1. Provide exposed fasteners of stainless steel or carbon steel with factory applied protective coating, with finish color coating to match the finish on aluminum.
 - 2. Provide fasteners not exposed to view of stainless steel or carbon steel with factory applied protective coating.

2.5 FABRICATION

- A. Fabricate louvers with close-fitting, field-made splice joints in blades designed to permit expansion and contraction without deforming blades or framework and with supporting members and hardware concealed from front edges of blades so blades have continuous appearance.
- B. General:
 - 1. Fabricate all units to produce uniform sight lines and to be level, plumb and in same plane as adjacent panels.
 - 2. Accurately fabricate all joints for proper fit.
 - 3. Protect exposed surfaces against damage from scratches and discoloration.
- C. Louvers:
 - 1. Fabricate continuous blade louvers from minimum 0.1 inch thick extruded aluminum to shapes and configurations shown on the Drawings.
 - 2. Provide support clips from minimum 0.125 inch thick extruded aluminum to comply with specified performance criteria and manufacturer's fabrication procedures and standards.
 - 3. Provide vertical supports ("trees") from minimum 3 inch by 3 inch by 0.188 inch thick extruded aluminum angles to comply with specified performance criteria and manufacturer's fabrication procedures and standards, at spacings not further apart than recommended by manufacturer.
 - 4. Corners:
 - a. Provide inside and outside corners fabricated from 6 inch by 6 inch by 0.100 inch thick aluminum trim, painted to match louver blades, to be fastened with exposed fasteners.
 - b. Provide inside and outside mitered louver blades 24 inches in length to be installed butted together in field to form louver corners.
 - c. Provide inside and outside corners fabricated from mitered and welded louver blades that extend 24 inches in each direction. Finish corners after welding is complete.
- D. Provide all accessories and materials for fabrication, assembly and installation required to provide a complete and warranted louver installation.

SECTION 08900

ALUMINUM LOUVERS

2.6 FINISH OF ALUMINUM

- A. Provide all louver members and accessories free of scratches and serious blemishes affecting the finish system.
- B. Fluoropolymer Paint Finish: Factory finish all louver members, trims and mitered corners with thermoset fluoropolymer paint system in accordance with the manufacturer's printed requirements and performance specifications and the AAMA specification Ref. AAMA 2605 for Superior Performance Organic Coatings on Aluminum Extrusions and Panels.
- C. Custom Color – Architect to provide color sample to match.

PART 3 – EXECUTION

3.1 INSPECTION

- A. Examine all surfaces to receive parts of the work specified herein. Verify all dimensions of in-place and subsequent construction. Installation of louvers constitutes acceptance of the existing conditions.

3.2 INSTALLATION

- A. Set all items in their correct locations as shown on the final reviewed shop drawings, level, square, plumb and at proper elevations and in alignment with other work.
- B. Assemble and anchor the various components to allow for expansion and contraction, maintaining a watertight installation.

3.3 CLEANING & PROTECTION

- A. After erection, protect exposed portions of the louvers from damage.
- B. Just prior to final acceptance, remove protective coverings and clean surfaces with plain water or if required, with a solution as recommended by manufacturer of finish coating system.
- C. Touch up finish coat system of all imperfections as recommended by manufacturer of finish coating system.
- D. Remove and replace any component that cannot be successfully repaired at no additional cost to the Owner.

END OF SECTION

SECTION 08910

METAL-FRAMED CURTAIN WALL

PART 1 – GENERAL

1.1 SECTION INCLUDES

- A. Aluminum-framed curtain wall, with vision glazing and glass, metal, and stone infill panels.
- B. Perimeter sealant.

1.2 RELATED SECTIONS

- A. Section 03300 - Cast-In-Place Concrete: Weld plates embedded in concrete for attachment of anchors.
- B. Section 05120 - Structural Steel: Steel attachment members.
- C. Section 07900 - Joint Sealers: Perimeter sealant and back-up materials.
- D. Section 08410 - Metal-Framed Storefronts: Entrance framing and doors.
- E. Section 08800 - Glazing.

1.3 REFERENCES

- A. AAMA CW-10 - Care and Handling of Architectural Aluminum From Shop to Site; American Architectural Manufacturers Association; 1997.
- B. AAMA 501.2 - Field Check of Metal Storefronts, Curtain Walls, and Sloped Glazing Systems for Water Leakage; American Architectural Manufacturers Association; 1994 (part of AAMA 501).
- C. ASTM A 36/A 36M - Standard Specification for Carbon Structural Steel; 2001.
- D. ASTM E 283 - Standard Test Method for Determining the Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen; 1991 (Reapproved 1999).
- E. ASTM E 331 - Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Uniform Static Air Pressure Difference; 2000.

1.4 PERFORMANCE REQUIREMENTS

- A. Design and size components to withstand the following load requirements without damage or permanent set:
 - 1. Member Deflection: Limit member deflection to flexure limit of glass in any direction, and maximum of 1/4 inch, with full recovery of glazing materials.
- B. Movement: Accommodate the following movement without damage to components or deterioration of seals:
 - 1. Movement of curtain wall relative to perimeter framing.
 - 2. Deflection of structural support framing, under permanent and dynamic loads.
- C. Air Infiltration: Limit air infiltration through assembly to 0.06 cu ft/min/sq ft of wall area, measured at a reference differential pressure across assembly of 1.57 psf as measured in accordance with ASTM E 283.
- D. Water Leakage: None, when measured in accordance with ASTM E 331 at a test pressure difference of 2.86 lbf/sq ft.
- E. System Internal Drainage: Drain to the exterior by means of a weep drainage network any water entering joints, condensation occurring in glazing channel, and migrating moisture occurring within system.
- F. Expansion/Contraction: Provide for expansion and contraction within system components caused by cycling temperature range of 170 degrees F over a 12 hour period without causing detrimental effect to system components, anchorages, and other building elements.
- G. Design system to eliminate noises caused by wind and thermal movement, to prevent vibration harmonics, and to prevent "stack effect" in internal spaces.

1.5 SUBMITTALS

- A. See Section 01300 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide component dimensions, describe components within assembly, anchorage and fasteners, glazing and infill and internal drainage details.

SECTION 08910

METAL-FRAMED CURTAIN WALL

- C. Shop Drawings: Indicate system dimensions, framed opening requirements and tolerances, affected related Work, expansion and contraction joint location and details, and field welding required.
- D. Samples: Submit two samples 12 x 24 inches in size illustrating finished aluminum surface, glazing, glazing materials.
- E. Test Reports: Submit results of full-size mock-up testing. Reports of tests previously performed on the same design are acceptable.
- F. Design Data: Provide framing member structural and physical characteristics and engineering calculations, and identify dimensional limitations.
- G. Report of field testing for water leakage.
- H. Warranty: Submit manufacturer warranty and ensure forms have been completed in Owner's name and registered with manufacturer.

1.6 QUALITY ASSURANCE

- A. Design structural support framing components under direct supervision of a Professional Structural Engineer experienced in design of this Work and licensed at the State in which the Project is located.
- B. Manufacturer and Installer: Company specializing in manufacturing aluminum glazing systems with minimum five years of documented experience.

1.7 MOCK-UP

- A. See Section 01400 Quality Requirements, for general requirements for mock-ups.
- B. Provide mock-up including all components occurring on project. Assemble to illustrate component assembly including glazing materials, weep drainage system, attachments, anchors, and perimeter sealant.
- C. Locate on-site where directed. Mock-up may remain as part of the Work.

1.8 PRE-INSTALLATION MEETING

- A. Convene two weeks before starting work of this section.

1.9 DELIVERY, STORAGE, AND PROTECTION

- A. Handle products of this section in accordance with AAMA CW-10.
- B. Protect finished aluminum surfaces with wrapping. Do not use adhesive papers or sprayed coatings which bond to aluminum when exposed to sunlight or weather.

1.10 PROJECT CONDITIONS

1.11 ENVIRONMENTAL REQUIREMENTS

- A. Do not install sealants when ambient temperature is less than 40 degrees F. Maintain this minimum temperature during and 48 hours after installation.

1.12 WARRANTY

- A. See Section 01780 - Closeout Submittals, for additional warranty requirements.
- B. Correct defective Work within a five year period after Date of Substantial Completion.

PART 2 – PRODUCTS

2.1 MANUFACTURERS

- A. Basis of Design: EFCO Corporation, Monett, MO 65708
 - 1. **Series 5600 Outside Glazed Curtain Wall System**
- B. Substitutions: See Section 01600 - Product Requirements.

SECTION 08910

METAL-FRAMED CURTAIN WALL

2.2 COMPONENTS

- A. Aluminum-Framed Curtain Wall: Factory fabricated, factory finished aluminum framing members with infill, and related flashings, anchorage and attachment devices.
- B. Aluminum Framing Members: Tubular aluminum sections, thermally broken with interior section insulated from exterior, drainage holes and internal weep drainage system.
 - 1. Cross-Section: As indicated on drawings.

2.3 MATERIALS

- A. Extruded Aluminum: ASTM B 221 (ASTM B 221M).
- B. Sheet Aluminum: ASTM B 209 (ASTM B 209M).
- C. Structural Steel Sections: ASTM A 36/A 36M; galvanized in accordance with requirements of ASTM A 123/A 123M.
- D. Structural Supporting Anchors: See Section 05120.
- E. Fasteners: Stainless steel.
- F. Exposed Flashings: 0.032 inch thick aluminum sheet; finish to match framing members.
- G. Concealed Flashings: 0.018 inch thick aluminum.
- H. Perimeter Sealant: As specified in Section 07900.
- I. Glazing: As specified in Section 08800.
- J. Glazing Gaskets: Type to suit application to achieve weather, moisture, and air infiltration requirements.
- K. Glazing Accessories: As specified in Section 08800.
- L. Touch-Up Primer for Galvanized Steel Surfaces: SSPC-Paint 20, zinc rich.

2.4 FINISHES

2.5 FABRICATION

- A. Fabricate components with minimum clearances and shim spacing around perimeter of assembly, yet enabling installation and dynamic movement of perimeter seal.
- B. Accurately fit and secure joints and corners. Make joints flush, hairline, and weatherproof.
- C. Prepare components to receive anchor devices. Fabricate anchors.
- D. Coat concealed metal surfaces that will be in contact with cementitious materials or dissimilar metals with bituminous paint.
- E. Arrange fasteners and attachments to conceal from view.
- F. Reinforce framing members for imposed loads.
- G. Finishing: Apply factory finish to all surfaces that will be exposed in completed assemblies.
 - 1. Touch-up surfaces cut during fabrication so that no natural aluminum is visible in completed assemblies, including joint edges.

PART 3 – EXECUTION

3.1 EXAMINATION

- A. Verify dimensions, tolerances, and method of attachment with other work.
- B. Verify that wall openings and adjoining air and vapor seal materials are ready to receive work of this section.
- C. Verify that anchorage devices have been properly installed and located.

3.2 INSTALLATION

- A. Install wall system in accordance with manufacturer's instructions.
- B. Attach to structure to permit sufficient adjustment to accommodate construction tolerances and other irregularities.
- C. Provide alignment attachments and shims to permanently fasten system to building structure.
- D. Align assembly plumb and level, free of warp or twist. Maintain assembly dimensional tolerances, aligning with adjacent work.
- E. Provide thermal isolation where components penetrate or disrupt building insulation.

SECTION 08910

METAL-FRAMED CURTAIN WALL

- F. Install sill flashings. Turn up ends and edges; seal to adjacent work to form water tight dam.
- G. Coordinate attachment and seal of perimeter air and vapor barrier materials.
- H. Install perimeter sealant in accordance with Section 07900.

3.3 ERECTION TOLERANCES

- A. Maximum Variation from Plumb: 0.06 inches every 3 ft non-cumulative or 0.5 inches per 100 ft, whichever is less.
- B. Maximum Misalignment of Two Adjoining Members Abutting in Plane: 1/32 inch.
- C. Sealant Space between Curtain Wall Mullions and Adjacent Construction: Maximum of 3/4 inch and minimum of 1/4 inch.

3.4 FIELD QUALITY CONTROL

- A. See Section 01400 - Quality Requirements, for general requirements for testing and inspection.
- B. Test installed curtain wall for water leakage in accordance with AAMA 501.2.
- C. Replace curtain wall components that have failed field testing and retest until performance is satisfactory.

3.5 MANUFACTURER'S FIELD SERVICES

- A. See Section 01400 - Quality Requirements, for general requirements for manufacturer observation of installation.
- B. Provide curtain wall manufacturer's field surveillance of the installation. Monitor and report installation procedures, unacceptable conditions.

3.6 CLEANING AND PROTECTION

- A. Remove protective material from pre-finished aluminum surfaces.
- B. Wash down surfaces with a solution of mild detergent in warm water, applied with soft, clean wiping cloths. Take care to remove dirt from corners. Wipe surfaces clean.
- C. Remove excess sealant by method acceptable to sealant manufacturer.
- D. Touch-up minor damage to factory applied finish; replace components that cannot be satisfactorily repaired.
- E. Protect finished work from damage.

END OF SECTION

SECTION 09260

GYPSUM BOARD ASSEMBLIES

PART 1 – GENERAL

1.1 SECTION INCLUDES

- A. Metal stud wall framing.
- B. Metal channel ceiling framing.
- C. Gypsum wallboard.
- D. Fiber Reinforced Gypsum Board.
- E. Joint treatment and accessories.

1.2 RELATED SECTIONS

- A. Section 06100 – Rough Carpentry: Building framing system and Gypsum sheathing.
- B. Section 06114 - Wood Blocking and Curbing: Wood blocking for support of wall-mounted equipment.

1.3 REFERENCES

- A. Unless noted otherwise, the most current issue of the reference shall be used.
- B. ASTM C 645 - Standard Specification for Nonstructural Steel Framing Members.
- C. ASTM C 665 - Standard Specification for Mineral-Fiber Blanket Thermal Insulation for Light Frame Construction and Manufactured Housing.
- D. ASTM C 754 - Standard Specification for Installation of Steel Framing Members to Receive Screw-Attached Gypsum Panel Products.
- E. Application of Gypsum Panel Products or Metal Plaster Bases to Wood Studs or Steel Studs.
- F. GA-600 - Fire Resistance Design Manual; Gypsum Association.

1.4 SUBMITTALS

- A. See Section 01300 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide data on metal framing, gypsum board, accessories, and joint finishing system.
- C. Product Data: Provide manufacturer's data on partition head to structure connectors, showing compliance with requirements.

1.5 QUALITY ASSURANCE

- A. Perform in accordance with ASTM C 840. Comply with requirements of GA-600 for fire-rated assemblies.
- B. Applicator Qualifications: Company specializing in performing gypsum board application and finishing, with minimum five years of documented experience.

1.6 REGULATORY REQUIREMENTS

- A. Conform to applicable code for fire rated assemblies as indicated on drawings.

PART 2 – PRODUCTS

2.1 METAL FRAMING MATERIALS

- A. Metal Framing Manufacturers:
 - 1. Clark Dietrich Building Systems; www.clarkdietrich.com
 - 2. Marino-Ware; www.marinoware.com.
 - 3. Telling Industries; www.buildstrong.com
 - 4. Substitutions: See Section 01600 - Product Requirements.
- B. Metal Framing Connectors and Accessories:
 - 1. Same manufacturer as framing.
- C. Non-Load bearing Framing System Components: ASTM C 645; galvanized sheet steel, of size and properties necessary to comply with ASTM C 754 for the spacing indicated unless exceeded herein, with maximum deflection of wall framing of L/240 at 5 psf. All interior framing shall be a minimum of 20 gauge.

SECTION 09260

GYPSUM BOARD ASSEMBLIES

1. Studs: C shaped with knurled faces.
2. Runners: U shaped, sized to match studs.
3. Ceiling Channels: C shaped.
4. Furring: Hat-shaped sections, minimum depth of 7/8 inch.
- D. Shaft Wall Studs and Accessories: ASTM C 645; galvanized sheet steel, of size and properties necessary to comply with ASTM C 754 and specified performance requirements.
- E. Ceiling Hangers: Type and size as specified in ASTM C 754 for spacing required.
- F. Partition Head to Structure Connections: Provide mechanical anchorage devices that accommodate deflection using slotted holes, screws and anti-friction bushings, preventing rotation of studs while maintaining structural performance of partition.
 1. Material: ASTM A 653/A 653M steel sheet, SS Grade 50, with G60/Z180 hot dipped galvanized coating.

2.2 GYPSUM BOARD MATERIALS

- A. Manufacturers:
 1. Georgia Pacific Gypsum Corporation; www.gp.com.
 2. National Gypsum Company; www.nationalgypsum.com.
 3. USG Corporation; www.usg.com.
 4. Lafarge North America Inc.; www.lafargenorthamerica.com
 5. Substitutions: See Section 01600 - Product Requirements.
- B. Gypsum Wallboard: ASTM C 36/C 36M and ASTM C 1396/C 1396M. Sizes to minimize joints in place; ends square cut.
 1. Thickness: 5/8 inch.
 2. Edges: Tapered.
- C. Type X: Fire resistant, UL or WH rated.
 1. Application: Vertical surfaces, unless otherwise indicated.
 - a. Thickness: 5/8 inch.
- D. Water-Resistant Gypsum Backing Board: ASTM C 630/C 630M and ASTM C 1396/C 1396M; ends square cut.
- E. Abuse Resistant Gypsum Board: Mo paper faced, gypsum-fiber reinforced panels for partition walls engineered to provide increased resistance to abrasion, indentation, and penetration.
 1. Basis of design: USG Fiberock Brand - AR Interior Panels
 2. Thickness: 5/8 in.
 3. Width: 4 ft.
 4. Edges: Long edges tapered, ends cut square
 5. Meet or exceed ASTM C1278:
 - a. Abrasion: Level 1
 - b. Indentation: Level 1
 - c. Soft Body Impact: Level 2
 - d. Hard Body Impact: Level 1
 6. Properties:
 - a. Flexural Strength: ASTM C473, >155 lbf
 - b. Compressive Strength: >500 psi
 - c. Nail-Pull Resistance: ASTM C473, >145 lbs
 - d. Weight: C473, 3.1 psf
 - e. Mold Resistance: ASTM D3273, 10 (No Growth)
 - f. Surface Burning Characteristics: ASTM E84, 5/0 flame/smoke
 7. Accessories:
 - a. Metal Corner Bead and Trim: USG Sheetrock and Beadex Brand as recommended by manufacturer
 - b. Primer-Surfacers: USG Sheetrock Brand Tuffhide as recommended by Manufacturer.
 - c. Control Joints: Provide at 28'-0" on center

SECTION 09260

GYPSUM BOARD ASSEMBLIES

2.3 ACCESSORIES

- A. Acoustic Sealant: Non-hardening, non-skinning, for use in conjunction with gypsum board.
- B. Finishing Accessories: ASTM C 1047, galvanized steel or rolled zinc, unless otherwise indicated.
- C. Joint Materials: ASTM C 475 and as recommended by gypsum board manufacturer for project conditions.
 - 1. Tape: 2 inch wide, creased paper tape for joints and corners, except as otherwise indicated.
- D. Screws: ASTM C 1002; self-piercing tapping type; cadmium-plated for exterior locations.

PART 3 – EXECUTION

3.1 EXAMINATION

- A. Verify that project conditions are appropriate for work of this section to commence.

3.2 FRAMING INSTALLATION

- A. Metal Framing: Comply with ASTM C 754 and manufacturer's instructions.
- B. Suspended Ceilings and Soffits: Space framing and furring members as indicated.
 - 1. Level ceiling system to a tolerance of 1/1200.
 - 2. Laterally brace entire suspension system.
- C. Studs: Space studs as permitted by standard.
 - 1. Extend partition framing to structure where indicated and to ceiling in other locations.
 - 2. Partitions Terminating at Ceiling: Attach ceiling runner securely to ceiling track in accordance with manufacturer's instructions.
 - 3. Partitions Terminating at Structure: Attach top runner to structure, maintain clearance between top of studs and structure, and connect studs to track using specified mechanical devices in accordance with manufacturer's instructions; verify free movement of top of stud connections; do not leave studs unattached to track.
- D. T intersections: Construct T intersections by using minimum of three studs with top, bottom and intermediate blocking or four full studs. Lock all walls together by fastening framing members together at 16 inches on center vertically. Walls secured through Gypsum materials only shall not be permitted.
- E. Corners: Construct corners using minimum of three studs with top, bottom and intermediate blocking or four full studs. Lock all walls together by fastening framing members together at 16 inches on center vertically. Walls secured through Gypsum materials only shall not be permitted.
- F. Openings: Install minimum double studs at wall openings, sides, top and bottom at door and window jambs and all other openings.
- G. Standard Wall Furring: Install at concrete and masonry walls scheduled to receive gypsum board, not more than 4 inches from floor and ceiling lines and abutting walls. Secure in place on alternate channel flanges at maximum 24 inches on center.
 - 1. Orientation: Vertical.
 - 2. Spacing: As indicated.
- H. Acoustic Furring: Install resilient channels at maximum 24 inches on center. Locate joints over framing members.
- I. Furring for Fire Ratings: Install as required for fire resistance ratings indicated and to GA-600 requirements.
- J. Blocking: Install blocking for support of plumbing fixtures, toilet partitions, wall cabinets, wood frame openings, toilet accessories, hardware, and other wall mounted items. Comply with Section 06100 for wood blocking.

3.3 ACOUSTIC ACCESSORIES INSTALLATION

- A. Acoustic Insulation: Place tightly within spaces, around cut openings, behind and around electrical and mechanical items within partitions, and tight to items passing through partitions.
- B. Acoustic Sealant: Install in accordance with manufacturer's instructions.

SECTION 09260

GYPSUM BOARD ASSEMBLIES

3.4 GYPSUM BOARD INSTALLATION

- A. Comply with ASTM C 840. Install to minimize butt end joints, especially in highly visible locations.
- B. Single Layer Non-Rated: Install gypsum board in most economical direction, with ends and edges occurring over firm bearing.
- C. Single Layer Fire-Rated: Install gypsum board vertically, with ends and edges occurring over firm bearing.
- D. Cementitious Backing Board: Install over studs in accordance with manufacturer's instructions.
- E. Installation on Metal Framing: Use screws for attachment of all gypsum board.

3.5 INSTALLATION OF TRIM AND ACCESSORIES

- A. Control Joints: Place control joints consistent with lines of building spaces and as indicated.
 - 1. Not more than 30 feet apart on walls and ceilings over 50 feet long.
- B. Corner Beads: Install at external corners, using longest practical length.
- C. Edge Trim: Install at locations where gypsum board abuts dissimilar materials and as indicated on drawings.

3.6 JOINT TREATMENT

- A. Finish gypsum board in scheduled areas in accordance with levels defined in ASTM C 840 and as scheduled below.
- B. Fill and finish joints and corners of cementitious backing board as recommended by manufacturer.

3.7 TOLERANCES

- A. Maximum Variation of Finished Gypsum Board Surface from True Flatness: 1/8 inch in 10 feet in any direction.

3.8 FINISH LEVEL SCHEDULE

- A. Level 1: Above finished ceilings concealed from view.
- B. Level 2: Utility areas and areas behind cabinetry.
- C. Level 3: Walls scheduled to receive textured wall finish.
- D. Level 4: Walls and ceilings scheduled to receive flat or eggshell paint finish.
- E. Level 5: Walls and ceilings scheduled to receive semi-gloss or gloss paint finish.

END OF SECTION

SECTION 09510

OPTIMA TEGULAR SHAPES FOR DESIGNFLEX

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general conditions of Contract, including General and Supplementary Conditions and Divisions-1 Specification sections apply to work of this section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Fiberglass ceiling panels
 - 2. Exposed grid suspension system.
 - 3. Wire hangers, fasteners, main runners, cross tees, wall angle moldings and accessories.
- B. Related Sections:
 - 1. Section 09511- Suspended Acoustical Ceilings
 - 2. Section 09260 - Gypsum Board Assemblies
 - 3. Divisions 15 - HVAC
 - 4. Division 16 Sections - Electrical Work
- C. Alternates
 - 1. Prior Approval: Unless otherwise provided for in the Contract documents, submit proposed product substitutions no later than TEN (10) working days prior to the date established for receipt of bids. Acceptability of a proposed substitution is contingent upon the Architect's review and acceptance. Approved products will be set forth by the Addenda. If a substitution is included in a Bid and is not approved by an Addendum, the specified products shall be provided in place of the substitute without additional compensation.
 - 2. Submittals which do not provide adequate data for the product evaluation, will not be considered. The proposed substitution must meet all requirements of this section, including but not necessarily limited to, the following: Single source materials suppliers (if specified in Section 1.5); panel design, size, composition, color, and finish; suspension system component profiles and sizes; compliance with the referenced standards.

1.3 REFERENCES

- A. American Society for Testing and Materials (ASTM):
 - 1. ASTM A 641 Standard Specification for Zinc-Coated (Galvanized) Carbon Steel Wire.
 - 2. ASTM A 653 Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) by the Hot-Dip Process.
 - 3. ASTM A 1008 Standard Specification for Steel, Sheet, and Cold Rolled Carbon, Structural, High-Strength Low-Alloy and High-Strength Low-Alloy with Improved Formability.
 - 4. ASTM C 635 Standard Specification for Metal Suspension Systems for Acoustical Tile and Lay-in Panel Ceilings.
 - 5. ASTM C 636 Recommended Practice for Installation of Metal Ceiling Suspension Systems for Acoustical Tile and Lay-in Panels.
 - 6. ASTM D 3273 Standard Test Method for Resistance to Growth of Mold on the Surface of Interior Coatings in an Environmental Chamber
 - 7. ASTM E 84 Standard Test Method for Surface Burning Characteristics of Building Materials.
 - 8. Underwriters Laboratories Incorporated
 - 9. ASTM E 580 Application of Ceiling Suspension Systems for Acoustical Tile and Lay-In Panels in Areas Requiring Seismic Restraint.
 - 10. ASTM C 423 Sound Absorption and Sound Absorption Coefficients by the Reverberation Room Method.
 - 11. ASTM E 1414 Standard Test Method for Airborne Sound Attenuation between Rooms Sharing a Common Ceiling Plenum
 - 12. ASTM E 1264 Classification for Acoustical Ceiling Products.
 - 13. International Building Code
 - 14. ASHRAE Standard 62.1-2004 Ventilation for Acceptable Indoor Air Quality

SECTION 09510

OPTIMA TEGULAR SHAPES FOR DESIGNFLEX

15. California Department of Public Health CDPH/EHLB Emission Standard Method Version 1.1 2010
16. NFPA 70 National Electrical Code
17. ASCE 7 American Society of Civil Engineers, Minimum Design Loads for Buildings and Other Structures
18. International Code Council-Evaluation Services - AC 156 Acceptance Criteria for Seismic Qualification Testing of Non-structural Components
19. International Code Council-Evaluation Services Report - Seismic Engineer Report
 - a. ESR 1308 - Armstrong T-Bar or Dimensional Suspension
20. LEED - Leadership in Energy and Environmental Design is a set of rating systems for the design, construction, operation, and maintenance of green buildings.
21. International Well Building Standard
22. Mindful Materials
23. Living Building Challenge
24. U.S. Department of Agriculture BioPreferred program (USDA BioPreferred).

1.4 SUBMITTALS

- A. Shop Drawings: Provide drawing of DesignFlex Ceiling Pattern Layout including panel type and components used in the assembly of the ceiling. Show locations of items that are to be coordinated with or supported by the ceilings.
- B. Installation Instructions: Submit manufacturer's installation instructions as referenced in Part three, Installation.
- C. Samples: Minimum 3-inch x 5/8-inch samples of specified wood panel; 8 inch long samples of exposed wall molding and suspension system, including main runner and 4 foot cross tees.
- D. Product Data: Submit manufacturer's technical data for each type of ceiling unit and suspension system required.
- E. Certifications: Manufacturer's certifications that products comply with specified requirements, including laboratory reports showing compliance with specified tests and standards.
- F. Non-Conformance: All products not conforming to the requirements of this specification and or the manufacturer's published values are to be disposed. The Contractor performing the work will replace with approved product at their expense.

1.5 QUALITY ASSURANCE

- A. Single-Source Responsibility: Provide ceiling panel units and grid components by a single manufacturer.
- B. Fire Performance Characteristics: Identify ceiling components with appropriate markings of applicable testing and inspecting organization.
 1. Surface Burning Characteristics: As follows, tested per ASTM E 84 and complying with ASTM E 1264 for Class A products.
 - a. Flame Spread: 25 or less.
 - b. Smoke Developed: 50 or less.
 2. Underwriter Laboratories Inc. certification and audit program as tested per ASTM E-84 tunnel test.
- C. Fire Sprinklers: Ceiling systems may obstruct or skew the planned water distribution pattern of fire sprinkler. In addition to creating a possible delaying or accelerating the activation of the sprinkler of fire detection system. Consult with a fire protection engineer for guidance.
- D. Coordination of Work: Coordinate ceiling work with installers of related work including, but not limited to building insulation, gypsum board, light fixtures, mechanical systems, electrical systems, and sprinklers.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Deliver acoustical ceiling units to project site in original, unopened packages and store them in a fully enclosed space where they will be protected against damage from moisture, direct sunlight, surface contamination, and other causes.

SECTION 09510

OPTIMA TEGULAR SHAPES FOR DESIGNFLEX

- B. Before installing acoustical ceiling units, permit them to reach room temperature and a stabilized moisture content.
- C. Handle acoustical ceiling units carefully to avoid chipping edges or damaged units in any way.

1.7 PROJECT CONDITIONS

- A. Space Enclosure:
 - 1. HumiGuard Plus Ceilings: Building areas to receive ceilings shall be free of construction dust and debris. Products with HumiGuard Plus performance and hot dipped galvanized steel, aluminum or stainless-steel suspension systems can be installed up to 120°F (49°C) and in spaces before the building is enclosed, where HVAC systems are cycled or not operating. Cannot be used in exterior applications where standing water is present or where moisture will come in direct contact with the ceiling.

1.8 WARRANTY

- A. Acoustical Panel: Submit a written warranty executed by the manufacturer, agreeing to repair or replace panels that fail within the warranty period. Failures include, but are not limited to the following:
 - 1. Acoustical Panels: Sagging and warping
 - 2. Grid System: Rusting and manufacturer's defects
- B. Warranty Period:
 - 1. Acoustical panels: Ten (10) years from date of substantial completion
 - 2. Suspension: Ten (10) years from date of substantial completion
 - 3. Ceiling System: Thirty (30) years from date of substantial completion
- C. The Warranty shall not deprive the Owner of other rights the Owner may have under other provisions of the Contract Documents and will be in addition to and run concurrent with other warranties made by the Contractor under the requirements of the Contract Documents.

1.9 MAINTENANCE

- A. Extra Materials: Deliver extra materials to Owner. Furnish extra materials described below that match products installed. Packaged with protective covering for storage and identified with appropriate labels.
 - 1. Ceiling Units: Furnish quality of full-size units equal to 2.0 percent of amount installed.
 - 2. Exposed Suspension System Components: Furnish quantity of each exposed suspension component equal to 1.0 percent of amount installed.

PART 2 – PRODUCTS (SAT-3)

2.1 MANUFACTURERS

- A. Basis of Design Optima for DESIGNFlex™ Tegular Panels:
 - 1. Armstrong World Industries, Inc.
 - a. DesignFlex Ceiling Pattern SH 13
- B. Suspension Systems:
 - 1. Armstrong World Industries, Inc.

2.2 CEILING UNITS

- A. Ceiling Panel:
 - 1. Surface Texture: Smooth
 - 2. Composition: Fiberglass
 - 3. Color: White
 - 4. Edge Profile: Square Tegular
 - 5. Light Reflectance (LR) White Panel: ASTM E 1477; 0.86
 - 6. Recycle Content: Post-Consumer - 1% - 3% Pre-Consumer - 73% - 75%
 - 7. Material Ingredient Transparency: Health Product Declaration (HPD); Declare Label
 - 8. Life Cycle Assessment: Third Party Certified Environment Product Declaration (EPD)

SECTION 09510

OPTIMA TEGULAR SHAPES FOR DESIGNFLEX

- 9. Sizes:
 - a. 60° Shapes
 - 1) Item 100202 Triangle 48 X 48 X 1"
 - b. 60° Shapes
 - 1) Item 100218 Left Parallelogram 24 X 48X 1"
- 10. Acoustical Performance based on Noise Reduction Coefficient ASTM C 423 (NRC) and Ceiling Attenuation Classification ASTM 1414 (CAC)

Item No.	NRC	CAC	Total Acoustics NRC + CAC
100202	0.95		BEST
100218	0.95		BEST

- 11. Flame Spread: Class A
 - 12. Dimensional Stability: HumiGuard Plus.
 - 13. Acceptable Product: Optima for DesignFlex as listed in 2.2.0 as manufactured by Armstrong World Industries.
- B. Accessories: Ordered Separately Based on Layout
- 1. Item 435 Stabilizer Clip
 - 2. Item BERC2 2" Beam End Retaining Clip
 - 3. Item PAC Perimeter Angle Clip

2.3 SUSPENSION SYSTEMS

- A. Components: All main beams and cross tees shall be commercial quality hot dipped galvanized steel as per ASTM A653. Main beams and cross tees are double-web steel construction with 9/16 inch type exposed flange design. Exposed surfaces chemically cleansed, capping prefinished galvanized steel in baked polyester paint. Main beams and cross tees shall have rotary stitching.
 - 1. Structural Classification: ASTM C635 (Intermediate Duty).
 - 2. Color: Blizzard White or color as selected by the Design Professional
 - 3. Acceptable Product: Listed Below as manufactured by Armstrong World Industries, Inc.
 - a. Item: 7500B60D Suprafine 9/16" - 12' ID Main Beam, Routs 6" OC
 - b. Item: XM7524 Suprafine 24" Base Perimeter Cross Tee
 - c. Item: XM7548 Suprafine 48" Base Perimeter Cross Tee
 - d. Item: XM756048 Suprafine 60° 48" Base Cross Tee
 - 4. Brackets
 - a. Item: BP75AB60D Suprafine Double Angle Bracket 60° Ordered Separately Based on Layout
 - b. Item: BP75AB60L Suprafine Left Angle Bracket 60° Ordered Separately Based on Layout
- B. Attachment Devices: Size for five times design load indicated in ASTM C 635, Table 1, Direct Hung unless otherwise indicated.
- C. Wire for Hangers and Ties: ASTM A641, Class 1 zinc coating, soft temper, pre-stretched, with a yield stress load of at least times-three design load, but not less than 12 gauge.
- D. Accessories/Edge Moldings and Trim: Ordered Separately Based on Layout
 - 1. Item: 7800 - 12' Hemmed Angle Molding

PART 3 – EXECUTION

3.1 EXAMINATION

- A. Do not proceed with installation until all wet work such as concrete, terrazzo, plastering and painting has been completed and thoroughly dried out.
- B. Proper designs for both supply air and return air, maintenance of the HVAC filters and building interior space are essential to minimize soiling. Before starting the HVAC system, make sure supply air is properly filtered and the building interior is free of construction dust.

SECTION 09510

OPTIMA TEGULAR SHAPES FOR DESIGNFLEX

3.2 3.2 PREPARATION

- A. Measure each ceiling area and establish layout of acoustical units to balance border widths at opposite edges of each ceiling. Avoid use of less than half width units at borders and comply with reflected ceiling plans. Coordinate panel layout with mechanical and electrical fixtures.

3.3 INSTALLATION

- A. Install suspension system and panels in compliance with ASTM C636, ASTM E580, with the approval of the authorities having jurisdiction, and in accordance with the manufacturer's Optima Shapes for DesignFlex Installation Instructions. [Click here to be linked to the Design and Installation Consideration Guide for DesignFlex ceilings.](#)

3.4 ADJUSTING AND CLEANING

- A. Replace damaged and broken panels.
- B. Clean exposed surfaces of ceilings panels, including trim, edge moldings, and suspension members. Comply with manufacturer's instructions for cleaning and touch up of minor finish damage.

END OF SECTION

SECTION 09511

SUSPENDED ACOUSTICAL CEILINGS

PART 1 – GENERAL

1.1 SECTION INCLUDES

- A. Acoustical ceiling panels.
- B. Suspension system.
- C. Wire hangers, fasteners, main runners, cross tees, and wall angle moldings.

1.2 RELATED SECTIONS

- A. Section 09260 – Gypsum Board Assemblies.
- B. Section 15940 – Air Outlets and Inlets.
- C. Section 16510 – Interior Luminaires.

1.3 REFERENCES

- A. Unless noted otherwise, the most current issue of the reference shall be used.
- B. ASTM A 1008 Standard Specification for Steel, Sheet, Cold Rolled, Carbon, Structural, High-Strength Low-Alloy and High-Strength Low-Alloy with Improved Formability.
- C. ASTM A 641 Standard Specification for Zinc-Coated (Galvanized) Carbon Steel Wire.
- D. ASTM A 653 Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) by the Hot-Dip Process.
- E. ASTM C 423 Sound Absorption and Sound Absorption Coefficients by the Reverberation Room Method.
- F. ASTM C 635 - Standard Specification for the Manufacture, Performance, and Testing of Metal Suspension Systems for Acoustical Tile and Lay-in Panel Ceilings.
- G. ASTM C 636 - Standard Practice for Installation of Metal Ceiling Suspension Systems for Acoustical Tile and Lay-in Panels.
- H. ASTM E 84 Standard Test Method for Surface Burning Characteristics of Building Materials.
- I. ASTM E 580 – Standard Practice for Application of Ceiling Suspension Systems for Acoustical Tile and Lay-in Panels in Areas Requiring Seismic Restraint.
- J. ASTM E 1414 Standard Test Method for Airborne Sound Attenuation Between Rooms Sharing a Common Ceiling Plenum.
- K. ASTM E 1111 Standard Test Method for Measuring the Interzone Attenuation of Ceilings Systems.
- L. ASTM E 1264 - Standard Classification for Acoustical Ceiling Products.
- M. ASTM E 1477 Standard Test Method for Luminous Reflectance Factor of Acoustical Materials by Use of Integrating-Sphere Reflectometers.
- N. ASTM D 3273 Standard Test Method for Resistance to Growth of Mold on the Surface of Interior Coatings in an Environmental Chamber.
- O. UL (FRD) - Fire Resistance Directory; Underwriters Laboratories Inc.

1.4 SUBMITTALS

- A. See Section 01300 - Administrative Requirements, for submittal procedures.
- B. Shop Drawings: Indicate grid layout and related dimensioning.
- C. Product Data: Provide data on suspension system components.
- D. Certifications: Manufacturer's certifications that products comply with specified requirements, including laboratory reports showing compliance with specified tests and standards. For acoustical performance, each carton of material must carry an approved independent laboratory classification of NRC, CAC, and AC.
- E. Samples: Submit two samples of each panel type; 12 x 12 inch in size illustrating material and finish of acoustical units.
- F. Samples: Submit two samples of each suspension system type; 12 inches long, of main runner, cross runner, and perimeter molding.
- G. Manufacturer's Installation Instructions: Indicate special procedures.

SECTION 09511

SUSPENDED ACOUSTICAL CEILINGS

1.5 QUALITY ASSURANCE

- A. Suspension System Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years documented experience.
- B. Acoustical Unit Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years documented experience.

1.6 ENVIRONMENTAL REQUIREMENTS

- A. Maintain uniform temperature of minimum 60 degrees F and maximum humidity of 40 percent prior to, during, and after acoustical unit installation.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Deliver acoustical ceiling units to project site in original, unopened packages and store them in a fully enclosed space where they will be protected against damage from moisture, direct sunlight, surface contamination, and other causes.
- B. Before installing acoustical ceiling units, permit them to reach room temperature and a stabilized moisture content.
- C. Handle acoustical ceiling units carefully to avoid chipping edges or damaged units in any way.

1.8 PROJECT CONDITIONS

- A. All ceiling products and suspension systems must be installed and maintained in accordance with manufacturer's written installation instructions for that product in effect at the time of installation and best industry practice.
- B. Prior to installation, the ceiling product must be kept clean and dry, in an environment that is between 32°F and 120°F and not subject to Abnormal Conditions. Abnormal conditions include exposure to chemical fumes, vibrations, moisture from conditions such as building leaks or condensation, excessive humidity, or excessive dirt or dust buildup.
- C. Sequence work to ensure acoustical ceilings are not installed until building is enclosed, sufficient heat is provided, dust generating activities have terminated, and overhead work is completed, tested, and approved.
- D. Install acoustical units after interior wet work is dry.

1.9 WARRANTY

- A. Acoustical Panel: Submit a written warranty executed by the manufacturer, agreeing to repair or replace acoustical panels that fail within the warranty period. Failures include, but are not limited to:
- B. Acoustical Panels: Sagging and warping as a result of defects in materials or factory workmanship.
- C. Grid System: Rusting and manufacturer's defects
- D. Acoustical Panels designated as inherently resistive to the growth of micro-organisms: Visible sag and will resist the growth of mold/mildew and gram positive and gram negative odor and stain causing bacteria.
- E. The Warranty shall not deprive the Owner of other rights the Owner may have under other provisions of the Contract Documents and will be in addition to and run concurrent with other warranties made by the Contractor under the requirements of the Contract Documents.

1.10 EXTRA MATERIALS

- A. See Section 01600 - Product Requirements, for additional provisions.
- B. Provide 3 Full Unopened Cases of acoustical of each type of acoustical unit for Owner's use in maintenance of project. Provide at the completion of the project.
 - 1. **Deliver to Maintenance Office: 7410 Duvan Drive, Tinley Park, IL 60477.**

SECTION 09511

SUSPENDED ACOUSTICAL CEILINGS

PART 2 – PRODUCTS

2.1 ACOUSTICAL UNITS

- A. Manufacturers:
 - 1. CertainTeed Ceilings: www.certainteed.com
 - 2. No Substitutions.
- B. Acoustical Units - General: ASTM E 1264, Class A.
- C. Acoustical Panels – Type I (**SAT-1**): Painted mineral fiber, ASTM E 1264 Type III, with the following characteristics:
 - 1. Size: 24 x 48 inches.
 - 2. Thickness: 5/8 inches.
 - 3. Composition: Wet felted.
 - 4. Density: 1.05 lb/cu ft.
 - 5. Light Reflectance: 84 percent, determined as specified in ASTM E 1264.
 - 6. NRC Range: .55 to .65, determined as specified in ASTM E 1264.
 - 7. Edge: Square.
 - 8. Surface Color: White.
 - 9. Surface Pattern: Non-directional fissured.
 - 10. Products:
 - a. CertainTeed: “Performa Fine Fissured #HHF-197”
 - 11. Suspension System: White Exposed grid.
- D. Acoustical Panels – Type II (**SAT-2**): Painted mineral fiber, ASTM E 1264 Type III, with the following characteristics:
 - 1. Size: 24 x 24 inches.
 - 2. Thickness: 1 inch.
 - 3. Composition: Fiberglass.
 - 4. NRC Range: .90, determined as specified in ASTM E 1264.
 - 5. Edge: Square.
 - 6. Surface Color: Black.
 - 7. Surface Pattern: Smooth.
 - 8. Products:
 - a. CertainTeed: “Theatre Black f”
- E. Suspension System: Black Exposed grid.

2.2 SUSPENSION SYSTEM SAT-1

- A. Manufacturer:
 - 1. Chicago Metallic www.chicagometallic.com
 - 2. No Substitutions.
- B. Suspension Systems - General: ASTM C 635; die cut and interlocking components, with stabilizer bars, clips, splices, and perimeter moldings as required.
- C. Exposed Steel Suspension System: Formed galvanized steel, commercial quality cold rolled; intermediate-duty.
 - 1. Profile: Tee, 15/16 inch wide face.
 - 2. Finish: Pre-finished White.
- D. **Provide 200 snap grid with hook-end cross tees (stab tees are not allowed).**

2.3 SUSPENSION SYSTEM SAT-2

- A. Manufacturer:
 - 1. Chicago Metallic www.chicagometallic.com
 - 2. No Substitutions.
- B. Suspension Systems - General: ASTM C 635; die cut and interlocking components, with stabilizer bars, clips, splices, and perimeter moldings as required.

SECTION 09511

SUSPENDED ACOUSTICAL CEILINGS

- C. Exposed Steel Suspension System: Formed galvanized steel, commercial quality cold rolled; intermediate-duty.
 - 1. Profile: Tee, 15/16 inch wide face.
 - 2. Finish: Prefinished Black.
- D. **Provide 200 snap grid with hook-end cross tees (stab tees are not allowed).**

2.4 ACCESSORIES

- A. Support Channels and Hangers: Match material and finish of suspension system; size and type to suit application, seismic requirements, and ceiling system flatness requirement specified.
- B. Perimeter Moldings: Same material and finish as suspension system.
 - 1. At Exposed Grid: Provide L-shaped molding for mounting at same elevation as face of grid.
- C. Gasket for Perimeter Moldings: Closed cell rubber sponge tape.
- D. Touch-up Paint: Type and color to match acoustical and grid units.

PART 3 – EXECUTION

3.1 EXAMINATION

- A. Verify existing conditions before starting work.
- B. Verify that layout of hangers will not interfere with other work.
- C. Do not proceed with installation until all wet work such as concrete, terrazzo, plastering and painting has been completed and thoroughly dried out, unless expressly permitted by manufacturer's printed recommendations.

3.2 INSTALLATION - SUSPENSION SYSTEM

- A. Install suspension system in accordance with ASTM C 636, ASTM E 580, and manufacturer's instructions and as supplemented in this section.
- B. Rigidly secure system, including integral mechanical and electrical components, for maximum deflection of 1:360.
- C. Lay out system to a balanced grid design with edge units no less than 50 percent of acoustical unit size.
- D. Install after major above-ceiling work is complete. Coordinate the location of hangers with other work.
- E. Hang suspension system independent of walls, columns, ducts, pipes and conduit. Where carrying members are spliced, avoid visible displacement of face plane of adjacent members.
- F. Where ducts or other equipment prevent the regular spacing of hangers, reinforce the nearest affected hangers and related carrying channels to span the extra distance.
- G. Do not support components on main runners or cross runners if weight causes total dead load to exceed deflection capability.
- H. Support fixture loads using supplementary hangers located within 6 inches of each corner, or support components independently.
- I. Do not eccentrically load system or induce rotation of runners.
- J. Perimeter Molding: Install at intersection of ceiling and vertical surfaces and at junctions with other interruptions.
 - 1. Install with continuous gasket.
 - 2. Use longest practical lengths.
 - 3. Overlap and rivet corners.
- K. Coordinate all existing pipe, conduit, and power pole penetrations through ceiling system. Provide trim plates at all penetrations to match finish of ceiling grid.

SECTION 09511

SUSPENDED ACOUSTICAL CEILINGS

3.3 INSTALLATION - ACOUSTICAL UNITS

- A. Install acoustical units in accordance with manufacturer's instructions.
- B. Fit acoustical units in place, free from damaged edges or other defects detrimental to appearance and function.
- C. Fit border trim neatly against abutting surfaces.
- D. Install units after above-ceiling work is complete.
- E. Install acoustical units level, in uniform plane, and free from twist, warp, and dents.
- F. Cutting Acoustical Units:
 - 1. Make field cut edges of same profile and finish as factory edges.
- G. Coordinate all existing pipe, conduit, and power pole penetrations through ceiling system. Provide trim plates at all penetrations to match finish of ceiling grid.

3.4 ERECTION TOLERANCES

- A. Maximum Variation from Flat and Level Surface: 1/8 inch in 10 feet.
- B. Maximum Variation from Plumb of Grid Members Caused by Eccentric Loads: 2 degrees.

3.5 ADJUSTING AND CLEANING

- A. Replace damaged and broken panels.
- B. Clean exposed surfaces of acoustical ceilings, including trim, edge moldings, and suspension members. Comply with manufacturer's instructions for cleaning and touch up of minor finish damage.
- C. Remove and replace work that cannot be successfully cleaned and repaired to permanently eliminate evidence of damage.

END OF SECTION

SECTION 09542

LINEAR METAL CEILING SYSTEM

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. LEED Data: www.ecomedes.com
 - 2. Perforated and non-perforated metal ceiling panels
 - 3. Acoustical backing
 - 4. Suspension systems
 - 5. Accessories; provide other necessary items including devices for attachment overhead construction, secondary members, splines, splices, connecting clips, wall connectors, wall angles, and other devices required for a complete installation.
 - 6. Supplemental support framing: Provide fully engineered secondary framing as required to meet code, conforming to layout shown in drawings, to support direct-hung metal ceilings suspension system.
- B. Related Sections / Work:
 - 1. Sections 05400 – Cold-Formed Metal Framing
 - 2. Sections 09260 – Gypsum Board Assemblies
 - 3. Sections 09511 – Suspended Acoustical Ceilings
- C. This Section covers the general requirements only for Acoustical Metal Ceilings as shown on the drawings. The supplying and installation of additional accessory features and other items not specifically mentioned herein, but which are necessary to make a complete installation, shall also be included or clarified accordingly.
- D. Qualification Data:
 - 1. Test Reports: Certified reports from independent agency substantiating structural compliance to windloads and other governing requirements.
 - 2. Certificates:
 - a. Data substantiating manufacturer and installer qualifications.
 - b. Certified data attesting fire rated materials comply with specifications.
 - 3. Manufacturer's Instructions: Detailed installation instructions and maintenance data.

1.3 REFERENCES

- A. American Society for Testing and Materials (ASTM)
 - 1. E 84 – “Standard Test Method for Surface Burning Characteristics of Building Materials”

1.4 SUBMITTALS

- A. Product Data: Manufacturer's published literature, including specifications.
- B. Product Certification: Manufacturer's certifications that products comply with specified requirements and governing codes including product data, laboratory test reports and research reports showing compliance with specified standards.
- C. Shop Drawings: Submit shop drawings for reflected ceiling plans (RCP's), drawn to scale, and indicating penetrations and ceiling mounted items. Show the following details:
 - 1. Reflected Ceiling Plan(s): Indicating metal ceiling layout, ceiling mounted items and penetrations.
 - 2. Suspension System, Carrier and Component Layout.
 - 3. Details of system assembly and connections to building components.
- D. Samples for Verification: Full-size units (or as specified below) of each type of ceiling assembly indicated; in sets for each color, texture, and pattern specified, showing the full range of variations expected in these characteristics. Submit samples for each type specified.
 - 1. 11" square metal panel units.
 - 2. 11" long samples of each exposed molding or trim.
 - 3. 11" long samples of each suspension component.

SECTION 09542

LINEAR METAL CEILING SYSTEM

1.5 QUALITY ASSURANCE

- A. Manufacturer/Installer Qualifications:
 - 1. Provide metal ceiling system components produced by a single manufacturer with a minimum 5 years' experience in actual production of specified products and with resources to provide consistent quality in appearance and physical properties, without delaying the work.
 - 2. Provide suspension system components produced by a single manufacturer to provide compatible components for a complete metal ceiling system installation.
 - 3. Perform installations using a firm with installers having no less than 3 years of successful experience on projects of similar size and requirements.
- B. Regulatory Requirements:
 - 1. Fire Rating Performance Characteristics: Install system to provide a flame spread of 0 - 25, complying with certified testing to ASTM E 84.
 - 2. Structural Criteria: Install and certify system to comply with structural and wind load requirements of governing codes.
 - 3. Installation Standard for Suspension System: Comply with ASTM C 636.
- C. Pre-installation Conference: Conduct a conference, prior to start of installation, to review system requirements, shop drawings, and all coordination needs.

1.6 DELIVERY, STORAGE AND HANDLING

- A. Deliver system components in manufacturer's original unopened packages, clearly labeled.
- B. Store components in fully enclosed dry space. Carefully place on skids, to prevent damage from moisture and other construction activities.
- C. Handle components to prevent damage to surfaces and edges, and to prevent distortion and other physical damage.

1.7 PROJECT CONDITIONS

- A. Begin system installations only after spaces are enclosed and weather-tight, and after all wet work and overhead work have been completed.
- B. Prior to starting installations, allow materials to reach ambient room temperature and humidity intended to be maintained for occupancy.

1.8 WARRANTY

- A. Provide specified manufacturer's warranty against defects in workmanship, discoloration, or other defect considered undesirable by the Architect or Employer.
- B. This warranty shall remain in effect for a minimum period of one (1) year from date of initial acceptance.

1.9 MAINTENANCE & EXTRA MATERIALS

- A. Maintenance Instructions: Provide manufacturer's standard maintenance and cleaning instructions for finishes provided.
- B. Extra Materials: Furnish extra materials described below that match products installed, are packaged with protective covering for storage, and are identified with labels describing contents. Only typical system components are included with attic stock.
 - 1. Acoustical Metal Ceiling Pan Units: Full-size units equal to two percent (2%) of amount installed.
 - 2. Ceiling Suspension System Components: Quantity of each grid and exposed component equal to two percent (2%) of amount installed.

SECTION 09542

LINEAR METAL CEILING SYSTEM

PART 2 – PRODUCTS (MP-1)

2.1 MANUFACTURER

- A. Provide Box 4 linear metal panel ceiling system manufactured by CertainTeed Architectural; 5015 Oakbrook Parkway, Suite 100, Norcross, GA 30093. Tel: (800) 366-4327; www.CertainTeed.com/Architectural Local Contact - Eric Haskell Mau Inc – 847-254-9288
- B. Substitutions not permitted

2.2 SYSTEM MATERIALS

- A. Linear metal panel ceiling system for interior installations:
 - 1. Panel Profile Type: Box 4, roll formed, .025" interior thick aluminum with square edges; 3-5/32" wide, 17/32" deep with 27/32" reveal to form a 4" module.
 - 2. Panel length: (Standard 12')(minimum 3' – maximum 16')
 - 3. Closure: No Closure Required. The reveal shall remain open
- B. Linear Suspension System:
 - 1. Carrier: Universal hat-shaped, .038" roll-formed aluminum section with hook-shaped tabs spaced to receive ceiling panels at 2" on-center and 27/32" apart. Support holes spaced 4" on-center. Finish: Factory-applied black enamel.
 - 2. Hanger Wire: 12 gage galvanized carbon steel hanger wire.
 - 3. Seismic/Wind Uplift Compression Struts: 1-1/2" (38 mm) deep, 16 Ga., cold-rolled steel "C" channels.
- C. Perforations: Non-Perforated
- D. Panel Finish:
 - 1. Paint; #8758 – White Oakwood
 - a. Decorated Wood-Look Powder Coat

2.3 ACCESSORY MATERIALS

- A. Panel Splice: Formed aluminum insert designed to snap-fit between ends of two ceiling panels. Finish:black
- B. Access Door: Site Built Access doors to be provided as illustrated on Architectural drawings.
- C. Acoustic Material – interior only: 1" Black Owens Corning Select Spund Blanket to be laid above the ceiling
- D. Air Distribution Devices: Provide distribution devices that are independently suspended, adjustable from below finished ceiling, capable of being concealed behind (invisible to view) and fully integrated with ceiling system to allow no interruption of ceiling components.
- E. Access panels to match selected finish- As detailed and located in the Architectural drawings.

PART 3 – EXECUTION

3.1 EXAMINATION

- A. Examine substrates and structural framing to which acoustical metal panels attach or abut, with installer present, for compliance with requirements specified in this and other Sections that affect installation and anchorage, and other conditions affecting performance of metal panel ceilings.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Coordination: Furnish layouts for cast-in-place anchors, clips, and other ceiling anchors whose installation is specified in other Sections.
- B. Measure each ceiling area and establish layout of acoustical metal pan units to balance border widths at opposite edges of each ceiling. Avoid using less-than-half-width units at borders, and comply with layout shown on reflected ceiling plans.
- C. Survey substrate for wall attachment to assure squareness and proper elevation for wall panel installation.

SECTION 09542

LINEAR METAL CEILING SYSTEM

3.3 INSTALLATION

- A. General: Install acoustical metal pan ceilings, per manufacturers shop drawings provided, per manufacturer's written instructions and to comply with publications referenced below.
 - 1. CISCA "Ceiling Systems Handbook"
 - 2. Standard for Ceiling Suspension System Installations - ASTM C 636
 - 3. Standard for Ceiling Suspension Systems Requiring Seismic Restraint - ASTM E 580
 - 4. IBC (International Building Code) Standard for Seismic Zone for local area
- B. Suspend ceiling hangers from building's approved structural substrates and as follows:
 - 1. Install hangers plumb and free from contact with insulation or other objects within ceiling plenum that are not part of supporting structure or of ceiling suspension system.
 - 2. Splay hangers only where required to miss obstructions; offset resulting horizontal forces by bracing, counter-splaying, or other equally effective means.
 - 3. Where width of ducts and other construction within ceiling plenum produce hanger spacings that interfere with location of hangers at spacing required to support standard suspension system members, install supplemental suspension members and hangers in form of trapezes or equivalent devices. Utilize supplemental suspension members and hangers to support ceiling loads within performance limits established by referenced standards and publications.
 - 4. Where used secure wire hangers to ceiling suspension members and to supports above with a minimum of three tight turns. Connect hangers directly either to structures or to inserts, eye screws, or other devices that are secure; that are appropriate for substrate; and that will not deteriorate or otherwise fail due to age, corrosion, or elevated temperatures.
 - 5. Space hangers not more than 48" on-center, along each member supported directly from hangers, unless otherwise indicated; and provide hangers not more than 12" from ends of each member. Supply supporting calculations from licensed Structural Engineer verifying hanger spacing meets all requirements, when spacing exceeds those recommended.
 - 6. Level grid to 1/8" in 10' from specified elevation(s), square and true.
 - 7. Adjust suspension system runners so they are square (within .5 degree from 90 degrees) and securely interlocked with one another. Remove and replace dented, bent, or kinked members.
- C. Secure bracing wires to ceiling suspension members and to supports acceptable to Architect/Engineer and/or inspector. Suspend bracing from building's structural members and/or structural deck, as required for hangers, without attaching to permanent metal forms, steel deck, or steel deck tabs (unless directed otherwise).
- D. Install edge moldings and trim of type indicated at perimeter of acoustical ceiling area and where necessary to conceal edges of acoustical metal pan. Method of edge trim attachment and design of edge trims to be approved by Architect.
 - 1. Screw attach moldings to substrate at intervals not more than 18" on-center and not more than 6" from ends, leveling with ceiling suspension system to a tolerance of 1/8" in 10'. Miter corners accurately and connect securely.
 - 2. Do not use exposed fasteners, including pop rivets, on moldings and trim without prior written approval, or unless detailed otherwise.
- E. Scribe and cut acoustical metal panel units for accurate fit at penetrations by other work through ceilings. Stiffen edges of cut units as required to eliminate evidence of buckling or variations in flatness exceeding referenced standards for stretcher-leveled metal sheet.
- F. Install acoustical metal panel units in coordination with suspension system. Fit adjoining units to form flush, tight joints. Scribe and cut units for accurate fit at borders and around construction penetrating ceiling.

3.4 ADJUST AND CLEAN

- A. Adjust components to provide uniform tolerances.
- B. Replace all ceiling panels that are scratched, dented or otherwise damaged.
- C. Clean exposed surfaces with non-solvent, non-abrasive commercial type cleaner.

END OF SECTION

SECTION 09545

CEILING ACOUSTICAL PANELS

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general conditions of Contract, including General and Supplementary Conditions and Divisions-1 Specification sections apply to work of this section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Non-Woven layered and formed Polyester felt fiber ceiling panels
 - 2. Wire hangers, fasteners, main runners, cross tees, and accessories.
- B. Related Sections:
 - 1. Section 09260 - Gypsum Board Assemblies
 - 2. Section 05400 – Cold Formed Metal Framing
 - 3. Divisions 15 - HVAC
 - 4. Division 16 Sections - Electrical Work
- C. Alternates
 - 1. Prior Approval: Unless otherwise provided for in the Contract documents, submit proposed product substitutions no later than TEN (10) working days prior to the date established for receipt of bids. Acceptability of a proposed substitution is contingent upon the Architect's review and acceptance. Approved products will be set forth by the Addenda. If a substitution is included in a Bid and is not approved by an Addendum, the specified products shall be provided as in place of the substitute without additional compensation.
 - 2. Submittals, which do not provide adequate data for the product evaluation, will not be considered. The proposed substitution must meet all requirements of this section, including but not necessarily limited to, the following: Single source materials suppliers (if specified in Section 1.5); panel design, size, composition, color, and finish; suspension system component profiles and sizes; compliance with the referenced standards.

1.3 REFERENCES

- A. American Society for Testing and Materials (ASTM):
 - 1. ASTM A641 Standard Specification for Zinc-Coated (Galvanized) Carbon Steel Wire.
 - 2. ASTM A653 Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) by the Hot-Dip Process.
 - 3. ASTM A1008 Standard Specification for Steel, Sheet, and Cold Rolled Carbon, Structural, High-Strength Low-Alloy and High-Strength Low-Alloy with Improved Formability.
 - 4. ASTM C635 Standard Specification for Metal Suspension Systems for Acoustical Tile and Lay-in Panel Ceilings.
 - 5. ASTM C636 Recommended Practice for Installation of Metal Ceiling Suspension Systems for Acoustical Tile and Lay-in Panels.
 - 6. ASTM D3273 Standard Test Method for Resistance to Growth of Mold on the Surface of Interior Coatings in an Environmental Chamber
 - 7. ASTM E84 Standard Test Method for Surface Burning Characteristics of Building Materials.
 - 8. ASTM E580 Application of Ceiling Suspension Systems for Acoustical Tile and Lay-In Panels in Areas Requiring Seismic Restraint.
 - 9. ASTM C423 Sound Absorption and Sound Absorption Coefficients by the Reverberation Room Method.
 - 10. ASTM E795 Standard Practices for Mounting Test Specimens During Sound Absorption Tests
 - 11. ASTM E 1264 Classification for Acoustical Ceiling Products.
- B. International Building Code
- C. ASHRAE Standard 62.1-2004 Ventilation for Acceptable Indoor Air Quality
- D. California Department of Public Health CDPH/EHLB Emission Standard Method Version 1.2 2017
- E. California Green Building Standards Code Cal Green Title 24
- F. NFPA 70 National Electrical Code

SECTION 09545

CEILING ACOUSTICAL PANELS

- G. ASCE 7 American Society of Civil Engineers, Minimum Design Loads for Buildings and Other Structures
- H. International Code Council-Evaluation Services - AC 156 Acceptance Criteria for Seismic Qualification Testing of Non-structural Components
- I. International Code Council-Evaluation Services Report - Seismic Engineer Report
 - 1. ESR 1289 - Armstrong Drywall Suspension
- J. LEED - Leadership in Energy and Environmental Design is a set of rating systems for the design, construction, operation, and maintenance of green buildings
- K. Underwriters Laboratories Green Guard
- L. International Living Building Challenge

1.4 SUBMITTALS

- A. Shop Drawings: Provide layout including panel type and components used in the assembly of the ceiling or walls. Show locations of items that are to be coordinated with the ceiling or walls.
- B. Installation Instructions: Submit manufacturer's installation instructions as referenced in Part three, Installation.
- C. Samples: Minimum 6-inch x 6-inch sample of the colors selected in the ceiling or wall design, include manufacturer sample of suspension components.
- D. Product Data: Submit manufacturer's technical data for each type of ceiling or wall unit and suspension system required.
- E. Certifications: Manufacturer's certifications that products comply with specified requirements, including laboratory reports showing compliance with specified tests and standards.
- F. Non-Conformance: All products not conforming to the requirements of this specification and or the manufacturer's published values are to be disposed. The Contractor performing the work will replace with approved product at their expense.

1.5 QUALITY ASSURANCE

- A. Single-Source Responsibility: Provide ceiling or wall panel units and suspension components by a single manufacturer.
- B. Fire Performance Characteristics: Identify ceiling or wall components with appropriate markings of applicable testing and inspecting organization.
 - 1. Surface Burning Characteristics: As follows, tested per ASTM E 84 and complying with Class A products.
 - a. Flame Spread: 25 or less
 - b. Smoke Developed: 450 or less
- C. Fire Sprinklers: Ceiling systems may obstruct or skew the planned water distribution pattern of fire sprinkler. In addition to creating a possible delaying or accelerating the activation of the sprinkler of fire detection system. Consult with a fire protection engineer for guidance.
- D. Coordination of Work: Coordinate ceiling or wall work with installers of related work including, but not limited to building insulation, gypsum board, light fixtures, mechanical systems, electrical systems, and sprinklers.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Deliver acoustical ceiling or wall units to project site in original, unopened packages and store them in a fully enclosed space where they will be protected against damage from moisture, direct sunlight, surface contamination, and other causes.
- B. Before installing acoustical ceiling or wall units, permit them to reach room temperature and a stabilized moisture content.
- C. White gloves recommended for handling to avoid marring, especially on light color panels.

SECTION 09545

CEILING ACOUSTICAL PANELS

1.7 PROJECT CONDITIONS

- A. Space Enclosure:
 - 1. HumiGuard Plus Ceiling and Walls: Building areas to receive ceiling and or walls shall be free of construction dust and debris. Products with HumiGuard Plus performance and hot dipped galvanized steel suspension systems can be installed up to 120°F (49°C) and in spaces before the building is enclosed, where HVAC systems are cycled or not operating. Cannot be used in exterior applications where standing water is present or where moisture will come in direct contact with the ceiling or walls.

1.8 WARRANTY

- A. Acoustical Panel: Submit a written warranty executed by the manufacturer, agreeing to repair or replace panels that fail within the warranty period.
- B. Warranty Period:
 - 1. Acoustical panels and Suspension: One (1) year from date of substantial completion
- C. The Warranty shall not deprive the Owner of other rights the Owner may have under other provisions of the Contract Documents and will be in addition to and run concurrent with other warranties made by the Contractor under the requirements of the Contract Documents.

1.9 MAINTENANCE

- A. Extra Materials: Deliver extra materials to Owner. Furnish extra materials described below that match products installed. Packaged with protective covering for storage and identified with appropriate labels.
 - 1. Ceiling or Wall Units: Furnish quality of full-size units equal to 2.0 percent of amount installed.
 - 2. Exposed Suspension System Components: Furnish quantity of each exposed suspension component equal to 1.0 percent of amount installed.

PART 2 – PRODUCTS (SAT-4)

2.1 MANUFACTURERS

- A. Basis of Design FELTWORKS Ceiling:
 - 1. Armstrong World Industries, Inc.
- B. Substitutions: See Section 01600 - Product Requirements.
- C. Suspension System:
 - 1. Provide Furring System for full installation.

2.2 CEILING UNITS

- A. Ceiling Panels:
 - 1. Surface Texture: Soft
 - 2. Composition: Non-woven layered and formed Polyester felt (PET) fiber
 - 3. Color: White
 - 4. Edge Profile: Square, Long Edges Beveled/Short Edges Beveled
 - 5. Light Reflectance (LR) Cotton Panel: ASTM E 1477; 0.78
 - 6. Material Ingredient Transparency: Health Product Declaration (HPD); Declare Label (EPD)
 - 7. Sizes (Select appropriate panel size):
 - a. Item: 8246 - 48" X 96" X 1"
 - 8. Acoustical Performance is tested per ASTM C423
 - a. Ceiling Panel
 - 1) Magnet to 7/8" metal furring – 0.85 NRC
 - 9. Flame Spread: Class A
 - 10. Dimensional Stability: HumiGuard Plus.
 - 11. Acceptable Product: FELTWORKS as manufactured by Armstrong World Industries.

SECTION 09545

CEILING ACOUSTICAL PANELS

2.3 SUSPENSION SYSTEM

- A. Attachment Devices: Size for five times design load indicated in ASTM C 635, Table 1, Direct Hung unless otherwise indicated.
- B. Accessories: Ordered Separately Based on Layout
 - 1. Item 6488 - Washers Mill Finish (paintable), White
 - 2. Item 6489 - #8 x 1-7/8" Screws for washer installation Mill Finish (paintable), White
 - 3. Item 6526 – Magnets (Rare Earth)
 - 4. Item 6527 #8 x 1" Screws for magnet installation
- C. Metal Furring: Steel channel/hat channel 20-gauge 7/8" galvanized steel. Installation to structure is the responsibility of the design team to provide guidance on the architectural plans or by the construction professional installing the framing.

PART 3 – EXECUTION

3.1 EXAMINATION

- A. Do not proceed with installation until all wet work such as concrete, terrazzo, plastering and painting has been completed and thoroughly dried out.
- B. Proper designs for both supply air and return air, maintenance of the HVAC filters and building interior space are essential to minimize soiling. Before starting the HVAC system, make sure supply air is properly filtered and the building interior is free of construction dust.

3.2 3.2 PREPARATION

- A. Measure each ceiling or wall area, establish layout of FELTWORKS acoustical units. Coordinate panel layout with mechanical and electrical fixtures.

3.3 3.3 INSTALLATION

- A. Install suspension system in compliance with the approval of the authorities having jurisdiction, and in accordance with the manufacturer's FELTWORKS Ceiling and Wall Installation Instructions.

3.4 3.4 ADJUSTING AND CLEANING

- A. Replace damaged or broken FELTWORKS panels.
- B. Clean exposed surfaces of ceilings and wall panels. Comply with manufacturer's instructions for cleaning and touch up of minor finish damage.

END OF SECTION

SECTION 09645

INDOOR RESILIENT ATHLETIC SURFACING

PART 1 – GENERAL

1.1 SECTION INCLUDES

- A. Supply and installation of the indoor resilient multipurpose surfacing for higher moisture levels up to 12lbs per ASTM F1869 and 92% RH per ASTM F2170.
- B. Application of the game lines.

1.2 REFERENCES

- A. Unless noted otherwise, the most current issue of the reference shall be used.
- B. ASTM F1869 “Standard Test Method for Measuring Moisture Evaporation Rate of Concrete Subfloor Using Anhydrous Calcium Chloride”.
- C. ASTM F2170 “Standard Test Method for Determining Relative Humidity In Concrete Floor Slabs Using In-Situ Probes”
- D. ASTM F710 “Standard Practice for Preparing Concrete Floors to Receive Resilient Flooring”
- E. ACI 302.2R-06 “Guideline for Concrete Slabs that Receive Moisture-Sensitive Flooring Materials”

1.3 PERFORMANCE REQUIREMENTS - NOT USED

1.4 SUBMITTALS

- A. Product Data
 - 1. Manufacturer’s promotional brochures, specifications and installation instructions.
- B. Samples
 - 1. Submit for selection and approval three (3) sets of the indoor resilient multipurpose surfacing, manufacturer’s brochures and sample boards. To be included are actual samples of all of the available colors, textures and styles.
 - 2. Submit color samples of all the available game line paint colors for selection and approval.
- C. Closeout Submittals
 - 1. Submit three (3) copies of the indoor resilient multipurpose surfacing and manufacturer’s maintenance instructions.
 - 2. Submit three (3) copies of the material and installation warranties as specified.

1.5 QUALITY ASSURANCE

- A. Qualifications
 - 1. The indoor resilient multipurpose surfacing shall have been actively marketed for a minimum of ten (10) years.
 - 2. The indoor resilient multipurpose surfacing shall be manufactured in an ISO 9001 certified plant.
 - 3. The indoor resilient multipurpose surfacing shall be manufactured in an ISO 14001 certified plant.
 - 4. The indoor resilient multipurpose surfacing supplier shall be an established firm experienced in the field and appointed as a distributor by the manufacturer of the indoor resilient multipurpose surfacing.
 - 5. The installer of the indoor resilient multipurpose surfacing shall have a minimum of five (5) years experience in the field installing the specified indoor resilient multipurpose surfacing and have worked on at least five (5) projects of similar size, type and complexity.
- B. Certifications
 - 1. Installer to submit the indoor resilient athletic surfacing manufacturer’s or distributor’s certification attesting that they are an approved installer of the indoor resilient multipurpose surfacing.
 - 2. The indoor resilient multipurpose surfacing manufacturer to submit official ISO 9001 certification for the facility in which the indoor resilient multipurpose surfacing is manufactured.
 - 3. The indoor resilient multipurpose surfacing manufacturer to submit official ISO 14001 certification for the facility in which the indoor resilient multipurpose surfacing is manufactured.

SECTION 09645

INDOOR RESILIENT ATHLETIC SURFACING

C. Testing

1. Submit shock absorption (force reduction) test results of the indoor resilient multipurpose surfacing when tested in accordance with the DIN V 18032-2 (April 2001) standard and certified by an independent testing laboratory approved to perform such testing.

1.6 DELIVERY, STORAGE, AND PROTECTION

A. Delivery

1. Material shall not be delivered until all related work is in place and finished and/or proper storage facilities and conditions can be provided and guaranteed stable according to manufacturer's recommendations.

B. Storage

1. Store the material in a secure, clean and dry location. Maintain temperature between 55° and 85° Fahrenheit. Store the indoor resilient athletic surfacing rolls in an upright position on a smooth flat surface immediately upon delivery to jobsite.

1.7 PROJECT CONDITIONS

- A. It is the responsibility of the general contractor/construction manager to maintain project/site conditions acceptable for the installation of the indoor resilient multipurpose flooring.
- B. The area in which the indoor resilient multipurpose surfacing will be installed shall be dry and weather tight. Permanent heat, light and ventilation shall be installed and operable.
- C. All other trades shall have completed their work prior to the installation of the resilient athletic flooring. The general contractor or Construction Manager shall maintain a secure and clean working environment before, during and after the installation. Suspension of other trades' work may be authorized providing their work will not damage the new flooring.
- D. Maintain a stable room temperature of at least 65°F for a minimum of one (1) week prior to, during and permanently thereafter installation.
- E. An effective low-permeance vapor barrier is placed directly beneath the concrete subfloor. For "on" or "below grade" installations, it is recommended to provide a permanent vapor barrier resistant to long term hydrostatic pressure/moisture exposure. Protrusions should be sealed to prevent moisture migration into the slab. Moisture should not be allowed to enter the slab after the completed construction.
- F. Concrete subfloor surface pH level up to 11.
- G. Concrete subfloor moisture content less than twelve (12) pounds/1,000 sq.ft./24 hours when tested using calcium chloride per ASTM F 1869 and 92% when tested using insitu probes per ASTM F2170.
- H. Concrete subfloor should be no greater than 1/8" within a 10 ft diameter. This tolerance can be measured in accordance with ASTM E1155.
A specified (FF) of 50 and an (FL) of 30 should reach this degree of floor flatness and floor level. There is no numerical correlation between F numbers and the deviation from the straight edge; however the above specified numbers should achieve a flat floor with minimal deviation in the slab. Reference ACI 117 and ACI 302.1R. The general contractor should provide a certificate of compliance with the above recommendations.
- I. Concrete subfloor must be clean and free of all foreign materials or objects including, but not limited to, curing compounds and sealers.
- J. Fill cracks, grooves, voids, depressions, and other minor imperfections with a cement-based patching/leveling compound that is for use under higher moisture conditions (12 lbs MVER per ASTM F 1869 and 92% RH per ASTM F 2170). Follow the manufacturer's directions. Moveable joints must be treated utilizing specific transitioning joint devices depending upon the architect's recommendations. Follow current ASTM F710 "Guidelines for the Preparation of Concrete Slabs to Receive Resilient Flooring".
- K. Refer to ACI 302.2R "Guidelines for Concrete Slabs that Receive Moisture-Sensitive Flooring Materials" for concrete design.
- L. Concrete slab shall be fortified with continual steel reinforcement.

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INDOOR RESILIENT ATHLETIC SURFACING

1.8 WARRANTY

- A. Materials
 - 1. The indoor resilient athletic surfacing shall be covered against manufacturing defects by a two (2) year written, limited warranty. The manufacturer of the indoor resilient multipurpose surfacing must provide this warranty.
- B. Installation
 - 1. The installation of the indoor resilient multipurpose surfacing shall be covered against poor workmanship and faulty installation by a two (2) year written, limited warranty provided by the manufacturer-approved installer.
- C. Wear
 - 1. The indoor resilient multipurpose surfacing shall be covered against wear through the wear layer by a fifteen (15) year written, limited warranty. This warranty must be provided by the manufacturer of the indoor resilient athletic surfacing.
- D. The resilient flooring manufacturer will warrant the installation (when installed according to all manufacturer's installation guidelines) moisture levels up to 12 lbs per ASTM F1869 and 92% RH per ASTM F2170
- E. See Section 01780 - Closeout Submittals, for additional warranty requirements.

1.9 ADDITIONAL MATERIALS

- A. Furnish to the owner additional materials containing a total of at least 1% of each different color or design of the indoor resilient athletic surfacing used on the project.

PART 2 – PRODUCTS (SVF-1)

2.1 MANUFACTURERS

- A. The basis of the design for the indoor resilient multipurpose surfacing is Taraflex Sport M Plus Dry-TEX™ as manufactured by Gerflor. All other installation accessories and related components must be either made or approved by the indoor resilient athletic surfacing manufacturer. Other products may be approved as equal if deemed qualified and submitted in accordance with the General Conditions.
- B. Substitutions: See Section 01600 - Product Requirements.

2.2 MATERIALS

- A. Indoor Resilient Multipurpose Surfacing
 - 1. Product shall consist of a 2.1 mm thick over 95% pure polyvinyl chloride (PVC) wear layer combined with pure PVC-CXP™ vertically elongated closed-cell foam cushion backing. D-Max™ multi-layer surface complex shall be reinforced with a non-woven fiberglass mesh placed between the wear layer and the foam backing to improve dimensional stability. Sanosol®, a fungistatic and bacteriostatic treatment shall be incorporated throughout the entire thickness. The wear surface shall be Triple-Action ProtecSol®, UV cured, factory applied, and permanently bonded to the surface of the resilient flooring. Field application of the surface treatment and/or Multi-Durometer products laminated or constructed in the field are unacceptable. Taraflex Sport M Plus with Dry-TEX™ incorporating a single source moisture mitigation system to include a proprietary backing and Gerpur (a single component VOC compliant adhesive) used in combination to allow for direct adhesion of Taraflex Sport flooring to a compliant concrete substrate. Moisture conditions are not to exceed 12 lbs per ASTM F1869 and 92% per ASTM F2170. Respect and observe Gerflor's written recommendations regarding installation over elevated moisture conditions applicable to concrete substrates.
 - 2. Physical properties of the indoor resilient athletic surfacing shall conform to the following minimums:

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INDOOR RESILIENT ATHLETIC SURFACING

Width	4'11" (1.50m)
Length	86'6" Standard
Total Thickness	7.2 mm / 0.28"
Static Load Limit ASTM F970 modified	<200 p.s.i.
Dynamic Load Limit (N) DIN V 18032-2 (April 2001)	>1000 N
Chemical Resistance ASTM D543	Excellent
Fungus Resistance ASTM G21	Complete
Critical Radiant Flux ASTM E648	Class 1
Sound Insulation ISO 717/2	>18 dB
Ball Rebound DIN V 18032-2 (April 2001)	>90%
Force reduction (shock absorption) DIN V 18032-2 (April 2001)	>35%

2.3 FINISHES

- A. Hardwood Design Series
 - 1. Wood look design- Basis of Design Maple #6381
- B. Texture
 - 1. Slightly grained (Hardwood Design Series).
- C. Game Line and Logo Paint Primer
 - 1. As approved by the indoor resilient athletic surfacing manufacturer.
- D. Game Line and Logo Paint
 - 1. As approved by the indoor resilient athletic surfacing manufacturer. Colors are to be selected from the manufacturer's standard range.

2.4 FABRICATION

- A. Welding Rod
 - 1. As supplied by the indoor resilient athletic surfacing manufacturer or supplier. Color to blend with the indoor resilient athletic surfacing color or design. All seams shall be welded to create a monolithic and impermeable surface.
- B. Adhesive
 - 1. As approved by the indoor resilient athletic surfacing manufacturer.

PART 3 – EXECUTION

3.1 EXAMINATION

- A. It is the responsibility of the general contractor to ensure that project/site conditions are acceptable for the installation of the indoor resilient athletic flooring.
- B. Verify that the area in which the indoor resilient athletic surfacing will be installed is dry and weather tight. Verify that permanent heat, light and ventilation is installed and operable.
- C. Verify that all other work that could cause damage, dirt and dust or interrupt the normal pace of the indoor resilient athletic flooring installation is completed or suspended.
- D. Verify that there is a stable room temperature of at least 65°F.

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INDOOR RESILIENT ATHLETIC SURFACING

- E. Verify that there are no foreign materials or objects on the subfloor and that the subfloor is clean and ready for installation.
- F. Review and document the results of the moisture tests to verify that the moisture evaporative rate is less than twelve (12) pounds/1,000 sq.ft./24 hours per ASTM F1869 and less than 92% RH per ASTM F 2170.
- G. Verify that the concrete subfloor surface pH level up to 11.
- H. Document the results indicating the slab is within manufacturer's tolerances for slab deviation.

3.2 PREPARATION OF SURFACES

- A. Sand the entire surface of the concrete slab.
- B. Sweep the concrete slab so as to remove all dirt and dust. If a sweeping compound is to be used it must be a sweeping compound that does not contain oil or other items that may inhibit the adhesive bond.

3.3 INSTALLATION

- A. The installation area shall be closed to all traffic and activity for a period to be set by the indoor resilient athletic surfacing installer. The indoor resilient athletic surfacing installation shall not begin until the installer is familiar with the existing conditions.
- B. All necessary precautions should be taken to minimize noise, smell, dust, the use of hazardous materials and any other items that may inconvenience others.
- C. Install the indoor resilient athletic surfacing in strict accordance with the indoor resilient athletic surfacing manufacturer's written instructions.
- D. Install the indoor resilient athletic surfacing minimizing cross seams. Provide a seam diagram during the submittal process for approval prior to installation.
- E. Paint game lines using approved game line paint primer and game line paint in strict accordance with the game line paint manufacturer's instructions.
- F. Install appropriate threshold plates or transition strips where necessary.

3.4 CLEANING AND PROTECTION

- A. Remove all unused materials, tools, and equipment and dispose of any debris properly. Clean the indoor resilient athletic surfacing in accordance with the manufacturer's instructions.
- B. If so required, protect the indoor resilient athletic surfacing from damage using coverings approved by the manufacturer until acceptance of work by the customer or their authorized representative.

END OF SECTION

SECTION 09650

RESILIENT FLOORING

PART 1 – GENERAL

1.1 SECTION INCLUDES

- A. Resilient tile flooring.
- B. Rubber wall base.
- C. Installation accessories.
- D. Subfloor preparation.

1.2 RELATED SECTIONS

- A. Section 03300 - Cast-In-Place Concrete
- B. Section 03505 - Self-Leveling Underlayment.

1.3 REFERENCES

- A. Unless noted otherwise, the most current issue of the reference shall be used.
- B. ASTM F 1066 - Standard Specification for Vinyl Composition Floor Tile.

1.4 SUBMITTALS

- A. See Section 01300 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide data on specified products, describing physical and performance characteristics; including sizes, patterns and colors available; and installation instructions.
- C. Selection Samples: Submit manufacturer's complete set of color samples for Architect's initial selection.
- D. Maintenance Data: Include maintenance procedures, recommended maintenance materials, and suggested schedule for cleaning, stripping, and re-waxing.

1.5 DELIVERY, STORAGE, AND PROTECTION

- A. Deliver materials in labeled packages. Store and handle in strict compliance with manufacturer's recommendations. Protect from damage due to weather, excessive temperatures, and construction operations.
- B. Deliver materials sufficiently in advance of installation to condition materials to room temperature prior to installation.
- C. Protect roll materials from damage by storing on end.

1.6 QUALITY ASSURANCE

- A. Manufacturer: Provide resilient flooring manufactured by a firm with a minimum of 10 years' experience in the fabrication of resilient flooring of types equivalent to those specified. Manufacturers proposed for use, which are not named in this Section, shall submit evidence of ability to meet performance requirements specified not less than 10 days prior to bid date.
- B. Color Matching: Provide resilient flooring products, including wall base and accessories, from one manufacturer to ensure color matching.
- C. Manufacturer capable of providing field service representation.
- D. Installer's Qualifications: Installer experienced (minimum of 2 years) to perform work of this section who has specialized in the installation of work similar to that required for this project and who is acceptable to the product manufacturer.
- E. Materials: For each type of material required for the work of this Section, provide primary materials which are the products of one manufacturer. Provide secondary materials which are acceptable to the manufacturer of the primary materials. Comply with applicable regulations regarding VOC (volatile organic compound) content of adhesives.

SECTION 09650

RESILIENT FLOORING

1.7 ENVIRONMENTAL REQUIREMENTS

- A. Maintain temperature in storage area between 55 degrees F and 90 degrees F.
- B. Store materials for not less than 48 hours prior to installation in area of installation at a temperature of 70 degrees F to achieve temperature stability. Maintain a temperature of 68 degrees F plus or minus 5 degrees F in spaces to receive resilient flooring. Specified temperature shall be maintained at least 48 hours before, during, and 48 hours after installation.

1.8 WARRANTY

- A. Provide manufacturer's standard one-year warranty against defects in manufacturing and workmanship of resilient flooring products. Provide manufacturer's standard limited wear warranty/conductivity warranty as specified under each product as applicable.

1.9 EXTRA MATERIALS

- A. See Section 01600 - Product Requirements, for additional provisions.
- B. Provide one (1) box of tile, 50 lineal feet of base and 5% of installed stair materials of each type and color specified.

PART 2 – PRODUCTS

2.1 MATERIALS – LUXURY VINYL TILE FLOORING

- A. Manufacturers:
 - 1. Basis of Design: Interface
 - 2. Refer to Finish Legend, Sheet A9.50, for product name, color, size, and installation method.
 - 3. Substitutions: See Section 01600 – Product Requirements
- B. **LVT-1, LVT-2, LVT-3, LVT-4, LVT-5, LVT-6, LVT-6, LVT-7, LVT-8, LVT-9, LVT-10, LVT-11, LVT-12:** Luxury Vinyl Tile
 - 1. Wear Layer Thickness: 22 mil
 - 2. Total Thickness: 4.5 mm
 - 3. Finish: Ceramor
 - 4. Slip Resistance: Greater than .055 wet/dry
 - 5. Indoor Air Quality: GREENGUARD Gold, CDPH 01350 compliant
- C. Manufacturer to provide high contract installation diagram. Coordinate with Architect.

2.2 MATERIALS – BASE - RUBBER

- A. Specified Manufacturer:
 - 1. Tarkett Johnsonite, Inc: www.commerical.tarkett.com
- B. Acceptable Manufacturers:
 - 1. Mohawk: www.mohawkgroup.com
 - 2. Marley Flexco: www.flexcofloors.com
 - 3. Roppe Corporation: www.roppe.com
 - 4. Nora: www.norarubber.com
 - 5. Burke Industries: www.burkeflooring.com
 - 6. Substitutions: See Section 01600 - Product Requirements.
- C. **RB-1**, Resilient Base: Manufactured from a homogeneous composition polyvinyl chloride (PVC)
 - 1. Height:
 - a. 4 inch base.
 - 2. Profile: Coved at areas of resilient flooring; straight at carpeted areas.
 - 3. Thickness: 0.125 inch thick.
 - 4. Finish: Satin
 - 5. Length: Roll
 - 6. Color: color to be selected from manufacturer's full range.
 - 7. Accessories: Premolded external corners, internal corners, and end stops.

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RESILIENT FLOORING

- D. **RB-2** (Gymnasium), Resilient Base: Manufactured from a homogeneous composition polyvinyl chloride (PVC)
1. Height:
 - a. 6 inch base
 2. Profile: Coved at areas of resilient flooring; straight at carpeted areas
 3. Thickness: 0.125 inch thick.
 4. Finish: Satin
 5. Length: Roll
 6. Color: color to be selected from manufacturer's full range.
 7. Accessories: Premolded external corners, internal corners, and end stops.

2.3 ACCESSORIES

- A. Subfloor Filler: White premix latex; type recommended by adhesive material manufacturer.
- B. Primers and Adhesives: Waterproof; types recommended by flooring manufacturer.
- C. Moldings and Edge Strips:
 1. At transitions between dissimilar floor finishes: Johnsonsite T-Molding or Equal. Color to be selected by Architect from manufacturers full color range.
- D. Filler for Coved Base: Plastic.
- E. Sealer and Wax: Types recommended by flooring manufacturer

PART 3 – EXECUTION

3.1 EXAMINATION

- A. Verify that sub-floor surfaces are smooth and flat within tolerances specified in Section 03300 and are ready to receive resilient flooring.
- B. Verify that concrete sub-floor surfaces are ready for resilient flooring installation by testing for moisture emission rate and alkalinity; obtain instructions if test results are not within the following limits:
 1. Moisture emission rate: Not greater than 3 lb per 1000 sq ft per 24 hours when tested using calcium chloride moisture test kit for 72 hours.
 2. Alkalinity: pH range of 5-9.
- C. Verify that required floor-mounted utilities are in correct location.
- D. Perform adhesive bond test in each major area, minimum 1 per 2,000 square feet, prior to installation. Examine after 72 hours to determine whether bond is solid and no moisture is present. Do not proceed with work until results of bond test are acceptable.

3.2 PREPARATION

- A. Where tile is shown or scheduled to be installed over existing tile, remove existing tile completely. Sand and level substrate with a latex underlayment acceptable to, or provided by, the tile flooring manufacturer. In addition, comply with the tile flooring manufacturer's procedures for installation over existing tile.
- B. Where only tile patching is required, remove existing tile back to full tile units and match coursing. Clean substrate and comply with tile manufacturer's instructions for installation over existing substrate.
- C. Comply with ASTM F 710-92 and manufacturer's recommendations for surface preparation. Remove substances incompatible with resilient flooring adhesive by method acceptable to manufacturer.
- D. Concrete floors with steel troweled (slick) finish shall be properly roughened up (sanded) to ensure suitable adhesion.
- E. Concrete floors with curing, hardening, and breaking compounds shall be abraded with mechanical methods only to remove compounds. Use blastrac or similar equipment.
- F. Remove sub-floor ridges and bumps. Fill minor low spots, cracks, joints, holes, and other defects with sub-floor filler to achieve smooth, flat, hard surface.

SECTION 09650

RESILIENT FLOORING

- G. Fill voids, cracks, and depressions with trowel-applied leveling compounds acceptable to manufacturer. Remove projections and repair other defects to tolerances acceptable to manufacturer.
- H. Prohibit traffic until filler is cured.
- I. Clean substrate by vacuuming subfloors immediately prior to installation to remove loose particles.
- J. Apply primer as required to prevent "bleed-through" or interference with adhesion by substances that cannot be removed.

3.3 INSTALLATION - GENERAL

- A. Install resilient flooring in accordance with manufacturer's printed installation instructions.
- B. Comply with the following:
 - 1. Layout resilient flooring to provide equal size at perimeter. Adjust layout as necessary to eliminate resilient flooring which is cut to less than half full width.
 - 2. Lay resilient flooring with arrows in the same direction.
 - 3. Install resilient flooring without cracks or voids at seams. Lay seams together without stress. Remove excess adhesive immediately.
 - 4. Scribe resilient flooring neatly at perimeter and obstructions.
 - 5. Extend resilient flooring into reveals, closets, and similar openings.
 - 6. Install reducer strips at exposed edges.
 - 7. Do not mix manufacturing batches of a color within the same area.
 - 8. Do not install resilient flooring over building expansion joints.
 - 9. Do not install defective or damaged resilient flooring.

3.4 INSTALLATION - TILE FLOORING

- A. Install in accordance with manufacturer's instructions.
- B. Mix tile from container to ensure shade variations are consistent when tile is placed.
- C. Spread only enough adhesive to permit installation of materials before initial set.
- D. Set flooring in place; press with heavy roller to attain full adhesion.
- E. Where floor finishes are different on opposite sides of door, terminate flooring under centerline of door.
- F. Install edge strips at unprotected or exposed edges, where flooring terminates, and where indicated. Secure metal strips (or type as indicated on drawings) before installation of flooring with stainless steel screws.
- G. Scribe flooring to walls, columns, cabinets, floor outlets, and other appurtenances to produce tight joints.

3.5 INSTALLATION - BASE

- A. Fit joints tightly and make vertical. Maintain minimum dimension of 18 inches between joints.
- B. Install base on solid backing. Bond tightly to wall and floor surfaces.

3.6 CLEANING

- A. Remove excess adhesive from floor, base, and wall surfaces without damage.

3.7 PROTECTION OF FINISHED WORK

- A. Prohibit traffic on resilient flooring for 48 hours after installation.

END OF SECTION

SECTION 09685

CARPET TILE

PART 1 – GENERAL

1.1 SECTION INCLUDES

- A. Carpet tile

1.2 REFERENCES

- A. Unless noted otherwise, the most current issue of the Reference shall be used.
- B. ASTM D 2859 – Standard Test Method for Ignition Characteristics of Finished Textile Floor Covering materials.
- C. ASTM E 84 – Standard Test Method for Surface Burning Characteristics of Building Materials.
- D. ASTM E 648 – Standard test Methods for Critical Radiant Flux of Floor-Covering Systems Using a Radiant Heat Energy Source.
- E. CRI 104 - Standard for Installation of Commercial Textile Floorcovering Materials; Carpet and Rug Institute.
- F. CRI (GLA) – Green Label testing Program – Approved Adhesive Products; www.carpet-rug.com.
- G. CRI (GLC) – Green Label Testing Program – Approved Product Categories for Carpet; www.carpet-rug.com.
- H. CRI (GLP) – Green Label Plus Carpet Testing Program – Approved Products; www.carpet-rug.org.
- I. NFPA 253 - Standard Method of Test for Critical Radiant Flux of Floor Covering Systems Using a Radiant Heat Energy Source; National Fire Protection Association.

1.3 SUBMITTALS

- A. See Section 01300 - Administrative Requirements, for submittal procedures.
- B. Shop Drawings: Indicate layout of joints, direction of carpet pile, and tile color locations.
- C. Product Data: Provide data on specified products, describing physical and performance characteristics; sizes, patterns, colors available, and method of installation.
- D. Samples: Submit two carpet tiles illustrating color and pattern design for each carpet color selected by Architect.
- E. Manufacturer's Installation Instructions: Indicate special procedures and perimeter conditions requiring special attention
- F. Maintenance Data: Include maintenance procedures, recommended maintenance materials, and suggested schedule for cleaning.
- G. For initial selection of colors and patterns, submit samples in form of actual sections of carpet tile including accessories, showing full range of colors and patterns available, for each type of carpet tile required.
- H. Submit manufacturer's certified test results to show that carpet meets or exceeds product performance specification criteria for carpet testing requirements (i.e. see section 2.3 flame, smoke, Aachen test, etc).

1.4 QUALITY ASSURANCE

- A. Manufacturer's Qualifications: Company specializing in manufacturing specified carpet tile with minimum three years documented experience.
- B. Installers shall have documented five year's experience as an Installer of at least 10 projects of similar size and complexity to this project. Workmen shall be experienced and skilled craftsmen.
- C. Source Quality Control: Prior to carpet tiles being shipped to project, ensure that manufacturer has tested all carpet and provided written certification that all carpet construction meets or exceeds each minimum of the project specifications.

1.5 ENVIRONMENTAL REQUIREMENTS

- A. Store materials in area of installation for minimum period of 24 hours prior to installation.

1.6 EXTRA MATERIALS

- A. See Section 01600 - Product Requirements, for additional provisions.
- B. Provide ten (10) carpet tiles of each color and pattern selected.

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CARPET TILE

1.7 DELIVERY, STORAGE, AND PROTECTION

- A. Deliver carpeting materials in sealed cartons for carpet tile and sealed containers for related materials. Deliver, store and handle all materials in a manner to prevent damage to materials and previous construction. Store in a safe, dry location, out of the way of other construction as directed. Material must be stored at least 68 degree F. (20 degree C.) for 3 days prior to installation.

1.8 WARRANTY

- A. Manufacturer's Warranty:
 - 1. Provide warranties by Carpet Manufacturer agreeing to replace defective materials during one (1) year warranty period following substantial completion. Also submit the following agreed upon warranties (chair pads not required):
 - 2. Wear - Surface fiber wear shall not be more than 10% by weight in 15 years.
 - 3. Static - Carpet will remain static generation at less than 3.0 kV at 70° F, and 20% R.H. for a period no less than 15 years.
 - 4. No edge ravel, backing separation for a period no less than 15 years
 - 5. No Dimensional Instability, i.e. shrinkage, stretching, curling and doming which adversely affect the ability of the tile to lay flat for a period no less than 15 years. See Aachen Test.
 - 6. Antimicrobial preservation properties warranted to be \geq 90% effective for a period no less than 15 years.
- B. Installing contractor shall rework any defective carpet handling or installation workmanship during one (1) year warranty period following substantial completion.

PART 2 – PRODUCTS

2.1 MANUFACTURERS

- A. Basis of Design:
 - 1. Interface, Inc.; ww.interface.com
 - 2. Mannington Commercial; manningtoncommercial.com
- B. Or Equal from Acceptable Manufacturers:
 - 1. Tarkett; www.commercial.tarkett.com
 - 2. Mohawk Group; www.mohawkgroup.com
 - 3. Shaw Contract; www.shawcontract.com
 - 4. Substitutions: See Section 01600 - Product Requirements.
- C. Products indicated are provided by specified manufacturer. All acceptable manufacturers shall provide products equal in color range, pattern range, performance data, and style to those specified and shall meet or exceed all minimum specifications listed.

2.2 MATERIALS

- A. Basis of Design Carpet Tile: Product must meet or exceed all of the following minimum specifications, Refer to Finish Legend, Sheet A9.50, for product name, color, size, and installation method
 - 1. **CPT-1, CPT-2, CPT-3:** Walk Off Style Carpet Tile
 - a. Manufacturer: Mannington
 - b. Dye Method: Solution
 - c. Yarn System: Type 6,6 Nylon.
 - d. Construction: Textured Pattern Loop
 - e. Gauge: 1/12
 - f. Pile Thickness: .185 inches
 - g. Pile Density: 7005 oz/yd³
 - h. Weight: 36 ounces
 - i. Backing: Infinity
 - j. Total Recycled Content: Contains Recycled Content

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CARPET TILE

- k. CRI Green Label Plus: CRI Green Label Plus Certified
 - l. ISO Requirements: Product must be produced by manufacturer that is ISO 9001 and ISO 14001 certified.
2. **CPT-4, CPT-5, CPT-6, CPT-7, CPT-8, CPT-9, CPT-10:** Plank Style Carpet Tile
- a. Manufacturer: Interface
 - b. Dye Method: 100& Solution Dyed
 - c. Yarn System: 100% Recycled Content Nylon
 - d. Construction: Tufted Textured Loop
 - e. Gauge: 1/12
 - f. Pile Thickness: .10 inches
 - g. Pile Density: 5942 oz/yd³
 - h. Weight: 17 ounces
 - i. Backing: GlasBac
 - j. Soil Release: Protekt 2 R
 - k. Total Recycled Content: 68.06%
 - l. CRI Green Label Plus: CRI Green Label Plus #GLP0820
 - m. ISO Requirements: Product must be produced by manufacturer that is ISO 9001 and ISO 14001 certified.
3. **CPT-11:** Plank Style Carpet Tile
- a. Manufacturer: Interface
 - b. Dye Method: 100& Solution Dyed
 - c. Yarn System: 100% Recycled Content Nylon
 - d. Construction: Tufted Textured Loop
 - e. Gauge: 1/12
 - f. Pile Thickness: .09 inches
 - g. Pile Density: 6545 oz/yd³
 - h. Weight: 16 ounces
 - i. Backing: GlasBac
 - j. Soil Release: Protekt 2 R
 - k. Total Recycled Content: 67.74%
 - l. CRI Green Label Plus: CRI Green Label Plus #GLP0820
 - m. ISO Requirements: Product must be produced by manufacturer that is ISO 9001 and ISO 14001 certified.
4. **CPT-12:** Plank Style Carpet Tile
- a. Manufacturer: Interface
 - b. Dye Method: 100& Solution Dyed
 - c. Yarn System: 100% Recycled Content Nylon
 - d. Construction: Tufted Textured Loop
 - e. Gauge: 1/12
 - f. Pile Thickness: .10 inches
 - g. Pile Density: 6821 oz/yd³
 - h. Weight: 18 ounces
 - i. Backing: GlasBac
 - j. Soil Release: Protekt 2 R
 - k. Total Recycled Content: 68.37%
 - l. CRI Green Label Plus: CRI Green Label Plus #GLP0820
 - m. ISO Requirements: Product must be produced by manufacturer that is ISO 9001 and ISO 14001 certified.
5. **CPT-13:** Plank Style Carpet Tile
- a. Manufacturer: Interface
 - b. Dye Method: 100& Solution Dyed
 - c. Yarn System: 100% Recycled Content Nylon
 - d. Construction: Tufted Textured Loop
 - e. Gauge: 1/12
 - f. Pile Thickness: .09 inches

SECTION 09685

CARPET TILE

- g. Pile Density: 7200 oz/yd³
 - h. Weight: 17 ounces
 - i. Backing: GlasBac
 - j. Soil Release: Protekt 2 R
 - k. Total Recycled Content: 64.05%
 - l. CRI Green Label Plus: CRI Green Label Plus #GLP0820
 - m. ISO Requirements: Product must be produced by manufacturer that is ISO 9001 and ISO 14001 certified.
6. **CPT-14:** Plank Style Carpet Tile
- a. Manufacturer: Interface
 - b. Dye Method: 100% Solution Dyed
 - c. Yarn System: 100% Recycled Content Nylon
 - d. Construction: Tufted Textured Loop
 - e. Gauge: 1/12
 - f. Pile Thickness: .12 inches
 - g. Pile Density: 6146 oz/yd³
 - h. Weight: 22 ounces
 - i. Backing: GlasBac
 - j. Soil Release: Protekt 2 R
 - k. Total Recycled Content: 69.26%
 - l. CRI Green Label Plus: CRI Green Label Plus #GLP0820
 - m. ISO Requirements: Product must be produced by manufacturer that is ISO 9001 and ISO 14001 certified
7. **CPT-15:** Plank Style Carpet Tile
- a. Manufacturer: Interface
 - b. Dye Method: 100% Solution Dyed
 - c. Yarn System: 100% Recycled Content Nylon
 - d. Construction: Tufted Textured Loop
 - e. Gauge: 1/12
 - f. Pile Thickness: .12 inches
 - g. Pile Density: 7636 oz/yd³
 - h. Weight: 14 ounces
 - i. Backing: GlasBac
 - j. Soil Release: Protekt 2 R
 - k. Total Recycled Content: 63.67%
 - l. CRI Green Label Plus: CRI Green Label Plus #GLP0820
 - m. ISO Requirements: Product must be produced by manufacturer that is ISO 9001 and ISO 14001 certified
8. **CPT-16:** Plank Style Carpet Tile
- a. Manufacturer: Interface
 - b. Dye Method: 100% Solution Dyed
 - c. Yarn System: 100% Recycled Content Nylon
 - d. Construction: Tufted Sheared
 - e. Gauge: 1/10
 - f. Pile Thickness: .13 inches
 - g. Pile Density: 6226 oz/yd³
 - h. Weight: 23 ounces
 - i. Backing: GlasBac
 - j. Soil Release: Protekt 2 R
 - k. Total Recycled Content: 69.82%
 - l. CRI Green Label Plus: CRI Green Label Plus #GLP0820
 - m. ISO Requirements: Product must be produced by manufacturer that is ISO 9001 and ISO 14001 certified

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CARPET TILE

2.3 REGULATORY REQUIREMENTS

- A. Proposed flooring must meet CRI Green Label Plus, State of Washington Protocol Environmental Safety Test, and GSA Antimicrobial Certification.
- B. Flammability Test Requirements:

Carpet Flammability

1. Pill Test (ASTM D2859 or CPSC FF-1-70)	Passes
2. Radiant Panel Test (ASTM E648)	≥ 0.45 watts/cm ² , Class 1
Smoke Density (ASTM E662)	≤ 450 Flaming Mode
Dimensional Stability (Aachen Method Din 54318)	$\leq 0.1\%$ change
Static Generation at 70° F (AATCC 134 w/ neolite)	≤ 2.5 kV at 20% R.H.
Lightfastness (AATCC 16E)	4.0 after 60 hours
Crocking (AATCC 165)	4.0 wet, dry
Cold Water Bleed (AATCC 107)	4.0
Gas Fade (AATCC 23)	4.0
Ozone Fade (AATCC 109)	4.0
Antimicrobial (AATCC 174, Part II)	$\geq 95.0\%$ reduction
Fungicidal (AATCC 174, Part III)	No growth
Soil/Stain Protection (AATCC 175-1991)	≥ 8.0 on the Red 40 Stain Scale

2.4 TRIM AND ACCESSORIES

- A. Sub-Floor Filler: White premix latex; type recommended by flooring material manufacturer.
- B. Trowelable Adhesive Installation: Waterproof type recommended and approved by respective carpet manufacturer for use with their materials under site installation conditions. Low VOC adhesives required.
- C. Edge Finishing: Provide rubber reducer/transition strip at all exposed edges. Color to be selected by Architect from manufacturer's full range.

PART 3 – EXECUTION

3.1 EXAMINATION

- A. Verify that sub-floor and wall surfaces are smooth and flat within manufacturer's tolerances and are ready to receive carpet tile.
- B. Verify that sub-floor and wall surfaces are dust-free, and free of substances which would impair bonding of adhesive materials to sub-floor surfaces.
- C. Verify that concrete sub-floor surfaces are ready for carpet tile installation by testing for moisture emission rate and alkalinity; obtain instructions if test results are not within limits recommended by carpet tile manufacturer and adhesive materials manufacturer.
 - 1. Repeat tests until results indicate conditions are within manufacturer's tolerances.
- D. Verify locations of existing floor-mounted utilities.
- E. Thoroughly inspect all sub-floors before commencement work. Notify Owner in writing immediately of all conditions which will prevent producing satisfactory work.
- F. Repair floor defects and irregularities prior to installation.
- G. Installation of materials constitutes Contractor's acceptance of previous construction and his assumption of responsibility for all unacceptable finished work caused by previous conditions

3.2 PREPARATION

- A. Remove sub-floor ridges and bumps. Fill minor or local low spots, cracks, joints, holes, and other defects with sub-floor filler.
- B. Apply, trowel, and float filler to achieve smooth, flat, hard surface. Prohibit traffic until filler is cured.
- C. Vacuum clean substrate.

SECTION 09685

CARPET TILE

3.3 INSTALLATION

- A. Install carpet tile in accordance with manufacturer's instructions and CRI 104.
- B. Blend carpet from different cartons to ensure minimal variation in color match.
- C. Install tiles such that seams are not obvious in the finish work.
- D. Provide an installation free of visual imperfections, adhesives, seam cement smears and other foreign matter.
- E. Cut carpet tile clean. Fit carpet tight to intersection with vertical surfaces without gaps.
- F. Set parallel to building lines, and center pattern within space.
- G. Locate change of color or pattern between rooms under door centerline.
- H. Fully adhere carpet tile to substrate.
- I. Trim carpet tile neatly at walls and around interruptions.
- J. Complete installation of edge strips, concealing exposed edges.

3.4 CLEANING

- A. Upon completion of work thoroughly inspect entire installation. Remove all defective work and replace with perfect materials.
- B. Cut off and trim all loose threads. Remove all visible adhesives, seam cement and scraps. Clean all carpet with an upright beater bar type vacuum cleaner.
- C. Remove all rubbish, debris, containers and all excess materials not selected by Owner for its retention and legally dispose of off the Owner's premises.
- D. Repair all damage to the Owner's property resulting from carpet work. Clean, repair or replace all damage as directed.
- E. Clean and vacuum carpet surfaces. Leave premises in clean, accepted condition.

3.5 PROTECTION OF FINISHED WORK

- A. Provide and maintain proper protection of finished carpet areas. Do not stack carpet tile cartons higher than is recommended by manufacturer.

END OF SECTION

SECTION 09720

DIGITALLY PRINTED VINYL WALLCOVERING MURALS

PART 1 – GENERAL

1.1 SUMMARY

- A. Furnish heavy weight wall liner designed for application of digitally printed wallcovering over primed and painted concrete masonry wall construction.
- B. Provide digitally printed wallcovering vinyl wallcovering, complete.
- C. Related Sections
 - 1. Section 092900 - Gypsum Board Assemblies.
 - 2. Section 099100 - Painting: Preparation and priming of substrate surfaces.

1.2 REFERENCES

- A. American Society for Testing and Materials (ASTM):
 - 1. E 84 Test Method for Surface Burning Characteristics of Building Materials.
- B. Wallcovering Association (WA):
 - 1. WA-101-2011 Quality Standard for Polymer Coated Fabric Wallcovering.
- C. Federal Specifications (FedSpec):
 - 1. CCC-W- 408A Wallcovering, Vinyl Coated
- D. Underwriters Laboratory, Inc. (UL)
 - 1. UL 723: Test for Surface Burning Characteristics of Building Materials
- E. National Fire Protection Agency (NFPA)
 - 1. NFPA 101 Life Safety Code
 - 2. NFPA 286 Standard Methods of Fire Tests for Evaluating Contribution of Wall and Ceiling Interior Finish to Room Fire Growth
 - 3. CAN/ULC-S102 Test for Surface Burning Characteristics of Building Materials and Assemblies

1.3 SUBMITTALS

- A. Submit one Color Proof for approval prior to manufacture of a full size miniature mural.
- B. Submit one full size miniature strike-off for approval prior to the manufacture of full size mural.
- C. Submit manufacturers' product data and installation instructions for each digitally printed wallcovering mural, adhesive and accessory required.
 - 1. Include data on physical properties, fire hazard classification and fire detection characteristics of wallcovering.
 - 2. Include manufacturer's recommendations for maximum permissible moisture content of substrates.
- D. Submit full-size samples of wallcovering, 54 inches wide by 36 inches long, cut from current production of each ground wallcovering selected to demonstrate quality, weight, color and embossing.
- E. Submit a sample of wall liner to be installed for the architect's approval.
- F. Submit manufacturer's written product certification that all furnished wallcovering ground meets or exceeds the specification requirements. Include certified copies of tests specified.
- G. Submit wallcovering ground manufacturer's written instructions for recommended maintenance of each type of wallcovering required.

1.4 QUALITY ASSURANCE

- A. Manufacturer: Provide each type of digitally printed vinyl wallcovering mural required produced by one manufacturer whose published product literature clearly indicates compliance of wallcovering ground with specified requirements.
- B. Applicator: Installation by skilled commercial wallcovering applicators with no less than three years of documented experience installing wallcovering murals of the types and extent specified for the project.
- C. Material Standards: Provide materials that meet or exceed Federal Specification CCC-W-408A and WA-101 Quality Standard for Polymer Coated Fabric Wallcovering for Type I and Type II & Type III wallcovering.

SECTION 09720

DIGITALLY PRINTED VINYL WALLCOVERING MURALS

- D. Physical Properties: Provide wallcovering with the following physical properties when tested in accordance with ASTM D751.
 - 1. Total weight: 21 oz./lin. Yd-type 2 and 33 oz Type 3
 - 2. Tensile Strength: 50 X 55 Minimum (W x F)
 - 3. Tear Strength: 25 X 25 Minimum (W x F)
- E. Fire Hazard Classification: Provide materials that comply with Class A fire rating when tested in accordance with ASTM E84.
- F. Underwriters Laboratories approval: Provide materials that have been tested and approved by Underwriters Laboratories.
- G. Smoke Toxicity: Provide materials that have been tested for smoke toxicity and approved for use by New York City Materials and Equipment Acceptance Division (MEA).
- H. Fire Detection Characteristics: Provide materials that have been laboratory tested for the Early Warning Effect® in accordance with ASTM E 603. Submit test results certifying that when one square foot section of the material is heated to 300 degrees F, the wallcovering emits an odorless, colorless non-toxic vapor that will activate an ionization smoke detector.
- I. Low Emissions: Provide materials that meet the requirements of California Integrated Waste Management Board's Special Environmental Requirements Specification CA 01350 for low emitting materials.

1.5 PRODUCT DELIVERY, STORAGE AND HANDLING

- A. Deliver digitally printed vinyl wallcovering mural to the project site in unbroken and undamaged wrappings and clearly labeled with the manufacturer's identification label, quality or grade, UL label and sidemark.
- B. Store materials in a clean, dry storage area with temperature maintained above 55 degrees with normal humidity.
- C. Store material in a flat position to prevent damage to roll-ends. Do not cross stack material. Support material off the floor in a manner to prevent sagging and warping.

1.6 PROJECT CONDITIONS

- A. Do not apply digitally printed wallcovering mural when surface and ambient temperatures are outside the temperature ranges required by the wallcovering manufacturer.
- B. Provide continuous ventilation and heating facilities to maintain substrate surface and ambient temperatures above 60 degrees F unless required otherwise by manufacturer's instructions.
- C. Apply adhesive only when substrate surface temperature or ambient temperature is above 60 degrees F, or relative humidity is below 40 percent.
- D. Maintain constant recommended temperature and humidity for at least 72 hours prior to, throughout the installation period and for 72 hours after wallcovering installation completion.
- E. Provide not less than an 80 foot candles per square foot lighting level minimum measured mid height at substrate surfaces.

1.7 WARRANTY

- A. Submit manufacturer's 5 year written warranty against manufacturing defects.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturers: All products by the same manufacturer.
 - 1. Basis of Design: Koroseal Digitally Printed Wallcovering Murals manufactured by Koroseal Interior Products, LLC. Contact Sales Rep: Heather Dalskov, hdalskov@koroseal.com , #312.415.1830, <http://www.koroseal.com/>
 - 2. Substitutions: See Section 01600 - Product Requirements.

SECTION 09720

DIGITALLY PRINTED VINYL WALLCOVERING MURALS

2.2 MATERIALS

- A. **Wallcovering (WC-2):** Basis of Design: Koroseal Digital Surfaces Wallcovering, Pattern: custom graphic by Architect. **Type III Digital** Print Grounds conforming to Federal Specification CCC-W-408A and WA-101-A using test methods given in Federal Specification CCC-T-191 b excepted as otherwise specified.
1. Total Weight: 33 ounces per linear yard.
 2. Thickness: 0.018 to 0.026 inches
 3. Fabric backing and content: Poly-Cotton Woven-(Change to Backing Woven polyester/cotton)
 4. Digital Image: Owner/Architect to provide PDF file of image to be digitally printed with UV inks on Koroseal Digital Surfaces Type III Wallcovering (or Architect approved equal).
 5. The manufacturer shall certify at the time of shipment that the materials furnished meet the published flame spread and smoke development Fire Hazard Classification Rating(s) of those products when tested according to ASTM-E84 Tunnel Test.
 6. The Adhesive used must be manufacturer's recommended adhesive and must contain mildew inhibitors.
 7. The Primer used must be manufacturer's recommended primer.

2.3 ACCESSORIES

- A. Adhesives: Koroseal A-848-B Heavy-Duty Premixed vinyl adhesive.
- B. Substrate Primer/Sealer: White pigmented alkyd or acrylic/latex base primer specifically formulated for use with vinyl wallcoverings.
- C. Metal Moldings: Extruded aluminum, alloy 6063-T5, long lengths, with fine satin mechanical finish and class 2 clear architectural anodic coating conforming to AA M21A31 designed for use with vinyl wallcoverings. J-Cap (JC12) Aluminum Trim for exposed wallcovering edge.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Installer shall inspect all areas and conditions under which the wallcovering is to be installed. Installer shall notify the contractor and architect in writing of any conditions detrimental to the proper and timely completion of the installation; work will proceed only when conditions have been corrected and accepted by the installer.
- B. Test substrates with a suitable moisture meter and verify that moisture content does not exceed 4 percent.
- C. Verify substrate surfaces are clean, dry, smooth, structurally sound, properly prepared and sealed, and free from surface defects and imperfections that would show through the finished surface. Sand down any protrusions in the existing surface in preparation for application of wallcovering. **Skim coat existing larger indentations that would telegraph thru the wallcovering. Surface shall be prepped to a level 4 surface or higher prior to application of wallcovering.**
- D. Evaluate all painted surfaces for the possibility of pigment bleed-through. If there is any possibility, a coat of sealer, recommended by the manufacturer, should be applied before application of the wall liner.
- E. If there is evidence of mildew, it must be removed, and the wall surface treated to inhibit further mildew growth.
- F. Notify the contractor and architect in writing of any conditions detrimental to the proper and timely completion of the installation. Beginning of installation means acceptance of surface conditions.

SECTION 09720

DIGITALLY PRINTED VINYL WALLCOVERING MURALS

3.2 INSTALLATION

- A. Wallcovering shall be installed by experienced workers and contractors in strict accordance with the manufacturer's printed instructions using the adhesive recommended by the manufacturer (WHEAT PASTE SHALL NOT BE USED). It is absolutely imperative that installer read the manufacturer's instruction sheet in each roll before installation. Permanent building light shall be available for installation.
- B. Always bring material six (6) inches around inside and outside corners being sure to fit into corners to avoid bridging and spanning.
- C. Allow digitally printed vinyl wallcovering mural to acclimatize to the area of installation a minimum of 24 hours before installation.
- D. Before cutting, examine image and color and determine that they are the correct image and color as specified for the correct location.
- E. Read and follow the instructions in the manufacturer's installation sheet contained in each roll of the digitally printed vinyl wallcovering mural.
- F. Use adhesive recommended by the wallcovering manufacturer.
- G. Install each panel in sequence as indicated on the drawings.
- H. If there are variations in color or image that are considered to be excessive, notify the manufacturer's representative for an inspection before any further wallcovering is installed.
- I. Smooth wallcovering to the hanging surface using a stiff bristled sweep brush to eliminate air bubbles, wrinkles, gaps and overlaps.
- J. Remove excess adhesive along finished seams immediately after each wallcovering strip applied. Use clean warm water, a natural sponge and clean towels. Change water often to maintain water cleanliness.

3.3 CLEAN-UP COMPLETION

- A. Upon completion of the work, remove surplus materials, rubbish and debris resulting from the wallcovering installation. Leave areas in neat clean and orderly condition.

END OF SECTION

SECTION 09721

PRESENTATION DRY-ERASE WALLCOVERING

PART 1 – GENERAL

1.1 SUMMARY

- A. Division Includes:
 - 1. Magnetic Receptive Dry Erase Wallcovering.
 - 2. Tray, Trim, and Presentation Rails.
 - 3. Accessories.
- B. Related Divisions:
 - 1. Division 09260 Gypsum Board Assemblies
 - 2. Division 09900 Interior Paints and Coatings.

1.2 REFERENCES

- A. American Society for Testing and Materials (ASTM):
 - 1. E84 - Test Method for Surface Burning Characteristics of Building Materials.
- B. Gypsum Association
 - 1. GA-214-M-97 - Recommended Levels of Gypsum Board Finish.

1.3 SUBMITTALS

- A. Manufacturer's product data and installation instructions for each type of dry erase wallcovering, adhesive, and accessories required.
- B. Manufacturer's written product data indicating compliance with specified materials required.
- C. Manufacturer's written installation instructions.
- D. Manufacturer's written instructions for recommended maintenance of each type of dry erase wall covering required.
- E. Samples:
 - 1. 7 inch (177.8mm) x 9 inch (228.6mm) samples of each dry erase material required.
 - 2. 6 inch (152.4mm) samples of trim, tray, and end caps required.

1.4 QUALITY ASSURANCE

- A. Manufacturer: Provide each type of dry erase wallcovering required produced by one manufacturer.
- B. Installer: Installation by skilled commercial wallcovering contractor with no less than three years of documented experience installing dry erase wallcovering of the types and extent required.
- C. Composition:
 - 1. Projectable Mag-Rite™: Provide woven backing, ferrous sheet bonded with white pigmented vinyl capped with matte, projectable, dry erase film.
- D. Surface Burning Characteristics Classification: Provide materials that meet Class I/A rating when tested in accordance with ASTM E84 for flame spread and smoke developed
- E. Field Samples: Prepare field samples for architect's review and establish requirements for seaming and finish trim.
 - 1. Install sample panel of each type presentation wallcovering specified in area designated by architect.
 - 2. Maintain corrected and approved samples to serve as a standard of performance for the project.

1.5 PRODUCT DELIVERY, STORAGE, AND HANDLING

- A. Deliver presentation wallcoverings to the project site in unbroken and undamaged original factory packaging and clearly labeled with the manufacturer's identification label, quality or grade, and lot number.
- B. Store materials in a clean, dry storage area with temperature maintained above 55°F (13°C) with normal humidity.
- C. Store material within original packaging to prevent damage.

SECTION 09721

PRESENTATION DRY-ERASE WALLCOVERING

1.6 PROJECT CONDITIONS

- A. Do not apply presentation wallcoverings when surface and ambient temperatures are outside the temperature ranges required by the wallcovering manufacturer.
- B. Provide continuous ventilation and heating facilities to maintain substrate surface and ambient temperatures above 55°F (13°C) unless required otherwise by manufacturer's instructions.
- C. Apply adhesive when substrate surface temperature and ambient temperature is above 55°F (13°C) and relative humidity is below forty percent.
- D. Maintain constant recommended temperature and humidity for at least 72 hours prior to and throughout the installation period, and for 72 hours after wallcovering installation completion.
- E. Provide not less than 80-foot-candles per square foot lighting level measured mid-height at substrate surfaces.

1.7 WARRANTY

- A. Submit manufacturer's limited ten-year written warranty against manufacturing defects.

1.8 MAINTENANCE

- A. Maintenance instructions: Include precautions against cleaning materials and methods that may be detrimental to finishes and performance.

PART 2 – PRODUCTS

2.1 MANUFACTURER

- A. Manufacturers: All products by the same manufacturer.
 - 1. Basis of Design: Koroseal Interior Products, LLC. Contact Sales Rep: Heather Dalskov, hdalskov@koroseal.com, #312.415.1830, <http://www.koroseal.com/>
- B. Substitutions: See Section 01600 - Product Requirements.

2.2 MATERIALS

- A. Walltalkers Projectable Mag-Rite (**WC-1**): Woven backed, ferrous sheet bonded with white pigmented vinyl capped with matte, projectable, dry erase film.
 - 1. M2PR: 47/48 inch (1.19/1.22m) width, scrim backing.
 - 2. The manufacturer shall certify at the time of shipment that the materials furnished meet the published flame spread and smoke development Fire Hazard Classification Rating(s) of those products when tested according to ASTM-E84 Tunnel Test.
 - 3. The Adhesive used must be manufacturer's recommended adhesive and must contain mildew inhibitors.
 - 4. The Primer used must be manufacturer's recommended primer.

2.3 TRIM & TRAY

- A. J Cap Wallcovering Trim designed to fit profile of material:
 - 1. JC12-00: Clear satin, anodized aluminum, low profile trim
- B. Quantum Aluminum Tray:
 - 1. 36", White, Magnetic (Classrooms).

2.4 ACCESSORIES

- A. Adhesives: Heavy-duty clear or clay based premixed vinyl adhesive.
- B. Primer/Sealer: White pigmented acrylic base primer/sealer specifically formulated for use with vinyl wallcoverings.
- C. Presentation Starter Kit: Provide one Walltalkers starter kit containing eight dry erase markers, one eraser, two dry erase cleaning cloths, one empty bottle for water, and one 8 ounce (.23kg) bottle liquid surface cleaning solution for each room installed with dry erase wallcovering.
 - 1. RK1RSK2: Regular starter kit with standard dry erase markers.

SECTION 09721

PRESENTATION DRY-ERASE WALLCOVERING

- D. Broad Tip Dry Erase Markers:
 - 1. EC12-99: Chisel BLK - 12CT
 - 2. EC04-00: Set of four colors: red, blue, green, black.
- E. Eraser:
 - 1. DEFE-99: Dry erase felt eraser.
 - 2. DECC-Y1: Dry erase cleaning cloth - yellow.
- F. Liquid Surface Cleaner:
 - 1. RCC8: 8 ounce (.23kg) bottle liquid surface cleaner.
- G. Magnets:
 - 1. MAG12: (12) Heavy duty magnets – black.
- H. Aluminum Marker Caddy: Provide 3 inch (76 mm) high x 7-1/4 inch (184 mm) wide aluminum caddy with four holes and a slot for storing markers and an eraser.
 - 1. AMC1-00: Aluminum marker & eraser caddy, silver anodized aluminum.
 - 2. AMC1-05: Aluminum marker & eraser caddy, white powder coated aluminum.
- I. Plywood Substrate and mechanical attachment-Refer to Architectural drawings for more information.

PART 3 – EXECUTION

3.1 EXAMINATION

- A. Examine substrates and installation conditions to ensure surface conditions meet or exceed a Level 4 finish, per GA-214-M-97: Recommended Levels of Gypsum Board Finish, and permanent lighting should be installed and operational.
- B. Test substrate with suitable moisture meter and verify that moisture content does not exceed four percent.
- C. Verify substrate surfaces are clean, dry, smooth, structurally sound, properly prepared and sealed, and free from surface defects and imperfections that would show through the finished surface. Sand down any protrusions in the existing surface in preparation for application of liner and wallcovering. Skim coat larger indentations that would telegraph thru the wallcovering. Surface shall be prepped to a level 4 surface or higher prior to application of wallcovering.
- D. Evaluate all painted surfaces for the possibility of pigment bleed-through.
- E. Notify the contractor and architect in writing of any conditions detrimental to the proper and timely completion of the installation.
- F. Beginning of installation means acceptance of surface conditions.

3.2 INSTALLATION:

- A. Wallcovering installation shall be installed by experienced workers and contractors in strict accordance with the manufacturer's printed instructions using the adhesive recommended by the manufacturer (WHEAT PASTE SHALL NOT BE USED). It is absolutely imperative that installer read the manufacturer's instruction sheet in each roll before installing the wall liner. Permanent building light shall be available for installation.
- B. Infill any indentations, sand down plywood substrate for smooth level surface.
- C. Prime and seal substrate with recommended primer- front, back, and all sides to avoid moisture absorbing into the wood.
- D. Always bring material six (6) inches around inside and outside corners being sure to fit into corners to avoid bridging and spanning.
- E. Acclimate wallcovering in the area of installation a minimum of 24 hours before installation.
- F. Read and follow the manufacturer's installation instruction sheet contained in each roll of the dry erase wallcovering. Examine all materials for pattern, color, quantity and quality, as specified for the correct location prior to cutting.
- G. Primer: Use a quality pigmented acrylic wallcovering primer.
- H. Adhesive: Apply a uniform coat of heavy-duty pre-mixed clay-based or extra strength clear wallcovering adhesive.

SECTION 09721

PRESENTATION DRY-ERASE WALLCOVERING

- I. Install each strip horizontally and in the same sequence as cut from the roll.
- J. Install dry erase wallcovering sheets in exact order as they are cut from bolt. Reverse hang alternate strips (except lined products). Do not crease or bend the wallcovering when handling.
- K. Install dry erase wallcovering horizontally using a level line.
- L. Using a level or straight edge, double cut the seam with a seam-cutting tool
 - 1. (Ex: Double Seam-Cutter or Swedish Knife). Do not score drywall or plasterboard when cutting material.
- M. Apply wallcovering to the substrate using a wallcovering smoother, wrapped with a soft cloth, to remove air bubbles. Do not use sharp edged smoothing tools. Smooth material on the wall from the middle to the outside edge.
- N. Remove excess adhesive immediately after the wallcovering is applied. Clean entire surface with a warm mild soap solution, and clean soft cloths. Rinse thoroughly with water and let dry before using. Change water often to maintain water clarity.
- O. Stop installation of material that is questionable in appearance and notify the manufacturer's representative for an inspection.

3.3 CLEAN-UP

- A. Upon completion of installation, remove all exposed adhesive immediately using a soft cloth and a warm, mild soap solution and rinse thoroughly with water and dry with clean towel prior to using.
- B. Upon completion of the work, remove surplus materials, rubbish, and debris resulting from the wallcovering installation. Leave areas in neat, clean, and orderly condition.

END OF SECTION

SECTION 09726

TACKABLE WALLCOVERING

PART 1 – GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Resilient cork/linoleum tackable wallcovering.
 - 2. Accessories.

1.2 SUBMITTALS

- A. Product data indicating compliance with specified requirements.
- B. Installation Instructions.
- C. Samples: 7 inch (18 centimeter) by 9 inch (23 centimeter) samples of each type of tackable wallcovering material required.
- D. Shop drawings illustrating locations.

1.3 QUALITY ASSURANCE

- A. Surface Burning Characteristics Classification: Provide materials that meet classification ratings below:
 - 1. ASTM E84 (Flame Spread and Smoke Developed)II/B
- B. Single Source Responsibility: Obtain tackable wallcovering system components from a single source.
- C. Deliver materials in original factory packaging, labeled with manufacturer, brand name, size, color, and lot number.
- D. Store materials in original, undamaged packaging inside a well-ventilated area protected from weather, moisture, soiling, and extreme temperatures.
 - 1. Maintain room temperature within the storage area at not less than 68 degrees Fahrenheit (20 degrees Celsius) during the period materials are stored.

1.4 PROJECT CONDITIONS

- A. Maintain ambient temperature within the building at not less than 68 degrees Fahrenheit (20 degrees Celsius) for a minimum of seventy-two hours prior to beginning of installation.
 - 1. Do not install tackable wallcovering until the space is enclosed and weatherproof.
 - 2. Do not install tackable wallcovering until temperature is stabilized and permanent lighting is in place.

1.5 MAINTENANCE

- A. Maintenance Instructions: Include precautions against cleaning materials and methods that may be detrimental to finishes and performance.

1.6 WARRANTY

- A. Submit manufacturer's limited five-year written warranty against manufacturing defects.

PART 2 – PRODUCTS

2.1 PRODUCTS

- A. Basis of Design: Walltalkers® Tac-Wall® (TB-1) Uni-color resilient homogeneous tackable linoleum surface consisting of linseed oil, granulated cork, rosin binders, and dry pigments calendered onto natural burlap backing. Color shall extend through thickness of material. Color to be selected from manufacturer's full color line.
- B. Substitutions: See Section 01600 - Product Requirements.

SECTION 09726

TACKABLE WALLCOVERING

2.2 ACCESSORIES

- A. Adhesive: Solvent-free, SBR type linoleum adhesive (L-910W) or polyvinyl acetate dispersion type (contact adhesive) when used in a press.
- B. J-Trim for Tac-Wall
 - 1. JT12-00: Clear satin, anodized aluminum, 1/4 inch (6 millimeter) trim
- C. Plywood substrate panel and mounting hardware as called out and illustrated on Architectural drawings.

PART 3 – EXECUTION

3.1 EXAMINATION

- A. Examine areas and conditions in which tackable wallcoverings will be installed.
 - 1. Complete finishing operations, including painting, before beginning installation of tackable wallcovering materials.
 - 2. Substrate to receive wallcovering materials shall be dry and free from dirt, grease, loose paint, and scale.
 - 3. Notify the contractor and architect in writing of any conditions detrimental to the proper and timely completion of the installation.
 - 4. Beginning of installation means acceptance of surface conditions.

3.2 PREPARATION

- A. Surface Preparation: Remove hardware, accessories, plates, and similar items to allow tackable wallcovering to be installed.
 - 1. Painted surface: Remove loose paint or scale. Sand surface of enamel or gloss paint and wipe clean with damp cloth.
 - 2. Ensure wall surfaces scheduled to receive tackable wallcovering are properly sealed with a quality primer specified for use under flexible vinyl wallcoverings. Prime all surfaces of plywood substrate to avoid moisture from soaking into wood.

3.3 APPLICATION

- A. Comply with manufacturer's printed installation instructions.
- B. Cut sheets to size including a few inches of overage. Allow sheets to lay flat for at least twenty-four hours prior to the application. Mark roll direction and sequence on the backside of each sheet. Hang sheets in sequence as cut from the roll, do not reverse sheets.
- C. Permanent HVAC system should be set to 68 degrees Fahrenheit (20 degrees Celsius) for at least seventy-two hours prior to, during, and after the installation.
- D. Back roll each sheet prior to the installation to release curl memory.
- E. For seamed applications, using a seam and strip cutter remove the factory edge of one sheet. Using the same tool, overlap and trace cut the mating edge of the second sheet. Repeat this step for as many sheets as required for the job.
- F. Scribe, cut, and fit material to butt tightly to adjacent surfaces, built-in casework, and permanent fixtures and pipes.
- G. Apply adhesive with a 1/16 inch square notch trowel to the area to receiving the sheet (apply enough for one sheet at a time).
- H. Work from top to bottom then side to side. Roll sheet firmly into adhesive for positive contact and to remove air bubbles.
- I. Remove adhesive residue immediately after each panel is hung with a mild soap/water solution and a soft cloth/sponge.

3.4 CLEANING

- A. Clean wallcovering using a sponge with a neutral pH cleaning solution. Do not use abrasive cleaners. Rinse thoroughly with water and let dry before using.
- B. It is important to remove adhesive while wet.

SECTION 09726

TACKABLE WALLCOVERING

3.5 PROTECTION

- A. Protect installed product and finish surfaces from damage during construction.

END OF SECTION

SECTION 09772

ARCHITECTURAL SURFACING FILMS

PART 1 – GENERAL

1.1 SECTION INCLUDES

- A. Graphic films for the following interior and exterior applications:
 - 1. Vertical surfaces.

1.2 RELATED SECTIONS

- A. 04810 Unit Masonry Assemblies.
- B. Section 09900 Paints and Coatings.

1.3 REFERENCES

- A. ASTM International (ASTM): ASTM E 84 - Standard Test Method for Surface Burning Characteristics of Building Materials.
- B. ASTM International (ASTM): ASTM E 308 - Standard Recommended Practice for Spectrophotometry and Description of Color in CIE 1931 System.
- C. ASTM International (ASTM): ASTM E 903 - Standard Methods of Test for Solar Absorbance, Reflectance and Transmittance of Materials Using Integrating Spheres.
- D. Underwriters Laboratories, Inc. (UL): UL 723 - Test for Surface Burning Characteristics of Building Materials.

1.4 SUBMITTALS

- A. Submit under provisions of Section 01 30 00 - Administrative Requirements.
- B. Product Data: Manufacturer's data sheets for products specified, including but not limited to:
 - 1. Performance characteristics.
 - 2. Preparation instructions and recommendations.
 - 3. Storage and handling requirements and recommendations.
 - 4. Maintenance data for installed products, including precautions against harmful cleaning materials and methods.
 - 5. Installation Instructions.
- C. Shop Drawings: Submit shop drawings showing layout, profiles, and product components, including dimensions, anchorage, and accessories.
- D. LEED Submittals: Refer to Division 01 for requirements regarding VOC limits, recycled content, regional materials, and required documentation.
- E. Verification Samples: For each film specified, two samples, 4 inches x 4 inches (100 mm x 100 mm), representing actual architectural film colors and patterns.

1.5 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Regularly engaged in the manufacture of architectural finish films.
- B. Installer Qualifications: Installation shall be performed by a trained and qualified installer, specialized and experienced in work required for this project. Tom Sitkowski, VP Bannerville 8170 S. Madison St. Burr Ridge, IL 60527 Ph. #630-320-5522 OR A list of 3M Endorsed installers is available at 3M.com/AMD or 3M Commercial Solutions, 1-888-650-3497.
- C. Mock-Up: Provide a mock-up for evaluation of surface preparation techniques and application workmanship.
 - 1. Finish areas designated by Architect.
 - 2. Do not proceed with remaining work until workmanship is approved by Architect.
 - 3. Refinish mock-up area as required to produce acceptable work.
 - 4. Mock-up area may become part of finished work if it is deemed acceptable by the Architect.
- D. Performance:
 - 1. Description: Custom digital printed opaque graphic film using Latex Inkjet inks with pressure-sensitive adhesive and air release channels. Flexible and highly-conformable for use on compound curves, corrugations, deep channels, and rivets. Field applied application.
 - 2. High performance, non-PVC 2 mil (51 Microns) thickness, not including adhesive.
 - 3. Meets ASTM 84

SECTION 09772

ARCHITECTURAL SURFACING FILMS

- a. Flame-Spread Index: 10 or less.
- b. Smoke-Developed Index: 0
4. Chemical Resistance: Resists mild alkalis, mild acids, and salt.

1.6 PRE-INSTALLATION MEETINGS

- A. Convene minimum two weeks prior to starting work of this section.

1.7 DELIVERY, STORAGE AND HANDLING

- A. Deliver, store and handle materials and products in strict compliance with manufacturer's instructions and recommendations and industry standards.
- B. Deliver products in manufacturer's original, unopened, undamaged containers with identification labels intact.
- C. Store products protected from weather, temperature, and other harmful conditions as recommended by supplier. Conditions including but not limited to:
 1. 40 degrees F to 90 degrees F (4 degrees C to 32 degrees C) maximum temperature.
 2. Out of sunlight.
 3. Clean dry area.
 4. Original container.
 5. Do not stack boxes over six (6) units high. Excessive weight can damage the film
 6. Relative humidity below 80 percent.
 7. Handle products in accordance with manufacturer's instructions.
 8. Total Pre-installation Shelf Life: Apply within 2 years of date of purchase.

1.8 PROJECT CONDITIONS

- A. Maintain environmental conditions (temperature, humidity and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's absolute limits.
 1. Acceptable Temperature Range: 54 degrees F to 100 degrees F (12 degrees C to 38 degrees C).
- B. Environmental Limitations: Do not install until spaces are enclosed and weatherproof, wet work in spaces is complete and dry, work above ceilings is complete, and ambient temperature and humidity conditions are maintained at the levels indicated for Project when occupied for its intended use

1.9 SEQUENCING

- A. Ensure that products of this section are supplied to affected trades in time to prevent interruption of construction progress.

1.10 WARRANTY

- A. Manufacturer's Standard Limited Warranty: For materials and workmanship.

PART 2 – PRODUCTS (VF-1)

2.1 MANUFACTURERS

- A. Acceptable Manufacturer: 3M Commercial Solutions, which is located at: 3M Center Bldg. 223; St. Paul, MN 55144-1000; Toll Free Tel: 888-650-3497; Tel: 651-737-1081; Fax: 651-737-8241; Email:[request info \(apeters2@mmm.com\)](mailto:request info (apeters2@mmm.com)); Web: [http:// 3m.com/3M/en_US/p/](http://3m.com/3M/en_US/p/)
- B. Substitutions: See Section 01600 - Product Requirements.

2.2 ARCHITECTURAL FINISH FILMS

- A. Envision Print Wrap Film LX480mC for application to interior primed and painted masonry walls.
- B. Envision Matte Wrap Overlamine 8550M.

SECTION 09772

ARCHITECTURAL SURFACING FILMS

PART 3 – EXECUTION

3.1 EXAMINATION

- A. Examine substrate(s) for compliance with requirements for painted masonry walls. Do not proceed with installation until unsatisfactory conditions have been corrected.
- B. Reference 3M Envision Technical Data Sheet and 3M Envision Installation Guide to determine compatibility of finish to substrate.
- C. Do not proceed with installation until unsatisfactory conditions have been corrected.
- D. Scheduling of installation implies that substrate and conditions are prepared and ready for product installation per the recommendations of the installation specialist.
- E. Proceeding with installation implies installer's acceptance of substrate and conditions.

3.2 SURFACE PREPARATION

- A. Comply with manufacturers' instructions for surface preparation. Consider these factors in determining the suitability of the Product:
 - 1. Substrate texture affects Product adhesion and application ease.
 - a. Unless the substrate is very smooth, its texture may be visible through product.
 - b. Compounds used to smooth a textured substrate permanently change that substrate.
 - c. Product removal may damage the substrate or its finish.
 - 2. Application surface conditions affect product adhesion.
 - a. Ensure that the existing paint, surface finish, or wall covering has excellent bond to the substrate area where product will be applied.
 - b. Repair, prime and paint the substrate, as needed.
 - c. An adhesion promoter may be required to increase product adhesion.
 - 3. Human and environmental conditions affect product.
 - a. Temperature and humidity in recommended range.
 - b. Direct UV light (sunlight).
 - c. Heating or cooling ducts in close proximity.
 - d. Unsealed substrates in front of water sources.
 - e. People or equipment that will be in contact with the product.
 - 4. The product may contain a splice. The location of the splices is marked with a tab along the edge of the product. The installer will need to determine the impact of the splice and work around it to make the best use of the material layout.
- B. Test and prepare application surfaces per instructions in the 3M Envision Installation Guide.
 - 1. Use the 3M Wall Adhesion Test to determine the compatibility of the application surface with the Product.
 - 2. Use the 3M Enhanced Cleaning Method to ensure that the application surface is ready to receive and hold the product.
- C. Repair damaged application surfaces per instructions in the 3M Envision Installation Guide
- D. Re-clean application surfaces with a lint-free cloth and 70/30 IPA cleaning solution, or use the 3M Enhanced Cleaning Method in the 3M Envision Installation Guide.

3.3 APPLICATION

- A. Refer to the 3M Envision Installation Guide for specific application instructions.
- B. Application must be performed by a qualified installer. Contact Tom Sitkowski, VP Bannerville 8170 S. Madison St. Burr Ridge, IL 60527 Ph. #630-320-5522 OR refer to 3M.com/AMD for a list of 3M-endorsed installers.
- C. Do not proceed with installation until all finishing work has been completed in and around the work area.
- D. Paint the wall with a quality, semi-gloss top coat. Do not use matte paint or paint with silicone, graffiti-resistant or texturizing additives.
- E. Allow the primer and paint to dry/cure as recommended by the primer/paint manufacturer, but no less than 5 days. Full curing requires at least 30 days in proper conditions.

SECTION 09772

ARCHITECTURAL SURFACING FILMS

- F. Measure the application surface and cut film to size with a minimum 1/2 in. extra on all sides for trimming.
- G. Install on application surfaces with no gaps, wire seams, or overlaps. Form smooth, wrinkle-free, bubble-free surface for finished installation.
- H. No exposed joints on corners or other "open" type joints permitted.
- I. Verify pattern prior to material acquisition as some part numbers do not allow three-dimensional forming.
- J. Comply with manufacturer's installation instructions applicable to products and applications indicated, except where more stringent requirements apply.
- K. Apply 3M film over properly prepared substrates.
- L. Remove air bubbles, wrinkles, and blisters. Use approved procedures to prevent the formation of air bubbles, wrinkles, blisters and other defects.

3.4 SCHEDULE

- A. Refer to Finish Legend on Architectural drawings for further information and Architectural drawings for locations.

3.5 CLEANING AND PROTECTION

- A. Use cleaning methods recommended by architectural surfacing manufacturer for applicable environment.
- B. Protect completed graphic film during remainder of construction period.
- C. Consult with authorized installation specialist for project specifics.

END OF SECTION

SECTION 09840

SOUND-ABSORBING CEILING UNITS

PART 1 – GENERAL

1.1 SECTION INCLUDES

- A. PET Acoustic Ceiling Beam Baffles.

1.2 RELATED SECTIONS

- A. Section 09511 Suspended Acoustical Ceilings.

1.3 REFERENCES

- A. ASTM C423 - Standard Test Method for Sound Absorption and Sound Absorption Coefficients by the Reverberation Room Method; 2009a.
- B. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2016.
- C. ASTM E795 - Standard Practices for Mounting Test Specimens During Sound Absorption Tests; 2016.

1.4 SUBMITTALS

- A. General: Submit manufacturer's documentation for each type of product under provisions of Section 01 30 30 - Administrative Requirements, for submittal procedures.
- B. Product Data: Manufacturer's printed data sheets for products specified.
- C. Shop Drawings: Fabrication and installation details, panel layout.
- D. Selection Samples: Manufacturer's color charts for applicable material, indicating full range of material, colors, and patterns available.
- E. Verification Samples: Fabricated samples of each type of product specified; 6" minimum length and width, showing construction, edge details.
- F. Test Reports: Certified test data from an independent test agency verifying that panels meet specified requirements for acoustical and fire performance.
- G. Maintenance Materials: Furnish maintenance information and recommendations for Owners use.

1.5 QUALITY ASSURANCE

- A. Source Limitations: All similar products to be obtained from a single manufacturer through one source providing a comprehensive material and installation package.
- B. Installer Qualifications: Utilization of an installer with demonstrated experience and quality in projects of similar size and complexity.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Protect acoustical units from moisture during shipment, storage, and handling. Deliver in factory-wrapped bundles; do not open bundles until units are needed for installation. Ensure all supplied hardware, material, and components are maintained until product is fully installed.
- B. Store units flat, in dry, well-ventilated space; do not stand on end.
- C. Protect edges from damage.
- D. Acclimatize product for minimum 24 hours at temperature and humidity approximately that of occupancy prior to installation.

1.7 PROJECT CONDITIONS

- A. Environmental Limitations: Do not deliver or install materials until spaces are enclosed from the exterior environment, wet work in spaces is complete and dry, and HVAC system is maintaining an ambient temperature at occupancy levels during the remainder of the construction period.
- B. Field Measurements: Installer to verify field measurements and dimensions as indicated in Design Submittal.
 - 1. Coordinate location of other product and trades with product layout.
- C. Ensure that Design Submittal signoffs and other required information are supplied in time to prevent interruption of construction process. Ensure that products of this section are supplied to affected trades in time to prevent interruptions.

SECTION 09840

SOUND-ABSORBING CEILING UNITS

1.8 WARRANTY

- A. Special Warranty: Refer to manufacturer's standard warranty for specific products, terms, and limitations.

PART 2 – PRODUCTS (BF-1)

2.1 MANUFACTURER

- A. Acceptable Manufacturer: TURF; Located at 2000 Fox Ln. Elgin, Illinois, 60123; Phone: 844.TURF.OMG (844.887.3664); Email: hello@turf.design; Web: www.turf.design
- B. Substitutions: Not permitted.

2.2 SOUND-ABSORBING AND SOUND-DIFFUSING PANELS

- A. Basis of Design:
 - 1. Turf Design; Product: 'BEAM BAFFLE' <https://turf.design/>
- B. Material Minimum Performance Attributes:
 - 1. Surface Burning Characteristics: Flame spread index of 25 or less and smoke developed index of 450 or less, when tested in accordance with ASTM E84.
 - 2. UL Tested ASTM E-84: Class A
 - 3. Noise Reduction Coefficient (NRC):
 - a. Tested in accordance with ASTM C423 for Type J ceiling mounting, per ASTM E795.
 - b. NRC 500hz > 0.62
 - c. NRC 1000hz > 0.92
 - d. Avg. apparent NRC: 1.5
- C. Product Attributes:
 - 1. Baffle Size: As indicated on shop drawings (design direction illustrated on Architectural drawings and per Architects approval).
 - a. 8"D typical by up to 119"L
 - 2. Baffle Thickness: 3"
 - 3. Edges: Exposed felt, machined edge.
 - 4. Corners: Square, exposed felt, machined edge.
 - 5. Material: Polyester (PET) felt, 60% pre-consumer recycled.
 - 6. Color: As indicated on Finish Legend on Architectural drawings.
 - 7. Patterns: As selected by Architect from manufacturer's full range and outlined in Submittal Drawings.
 - 8. Mounting Method: Horizontally suspended from ceiling as outlined in Submittal drawings.
 - a. Suspended with integrated recessed Rare Earth Magnetic attachment to T-Grid and other steel brackets (supplied by installer or contractor) as illustrated in Architectural drawings.

2.3 FABRICATION

- A. General: CNC fabricate panels to sizes, configurations and patterns on 9 mm PET felt. Factory installed hardware.
- B. Tolerances: Fabricate to finished tolerance of plus or minus 1/16 inch for thickness, overall length and width, and square-ness from corner to corner.

2.4 ACCESSORIES

- A. Ceiling-Suspended Accessories: Manufacturer's standard accessories at locations indicated on each acoustical unit, sized appropriately for weight of acoustical unit.
 - 1. Contractor to provide and install T Grid appropriate for magnetic connections as required for baffle installation.
 - a. Suspend T Grid at elevations indicated by the Architects drawings and Submittals.
 - b. Install T Grid as indicated on drawings

SECTION 09840

SOUND-ABSORBING CEILING UNITS

2. Contractor to select and provide all anchors to building for mounting based on site requirements, conditions, and as appropriate for application.
3. Provide ceiling mounting points for cable suspension from ceilings.

PART 3 – EXECUTION

3.1 EXAMINATION

- A. Examine substrates for conditions detrimental to installation of acoustical units. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. Install acoustical units in locations indicated, following manufacturer's installation instructions and in accordance with local jurisdiction authorities.
- B. Align panels accurately, with edges plumb and top edges level.
- C. Install acoustical units to construction tolerances of plus or minus 1/16 inch for the following:
 1. Plumb and level.
 2. Flatness.
 3. Width of joints.
- D. This product cannot be field trimmed.

3.3 CLEANING

- A. Clean felt facing upon completion of installation from dust and other foreign materials, following manufacturer's instructions.
- B. Vacuum occasionally to remove any particulate matter and air-borne debris or dust. Compressed air can be used to dust the material in difficult to reach areas or for large assemblies.

3.4 PROTECTION

- A. Provide protection of installed acoustical panels until completion of the work.
- B. Replace panels that cannot be cleaned and repaired to satisfaction of the Architect.

END OF SECTION

SECTION 09843

ACOUSTIC PANELS

PART 1 – GENERAL

1.1 SECTION INCLUDES

- A. Polyester (PET) felt acoustical panels.
- B. Mounting accessories

1.2 RELATED SECTIONS

- A. Section 04810 – Unit Masonry Assemblies.
- B. Section 05310 – Metal Deck.
- C. Section 06100 – Rough Carpentry.
- D. Section 06114 – Wood Blocking and Curbing.
- E. Section 09260 – Gypsum Board Assemblies.

1.3 REFERENCES

- A. Unless noted otherwise, the most current issue of the reference shall be used.
- B. ASTM E 84 - Standard Test Method for Surface Burning Characteristics of Building Materials.
- C. ASTM C 423 - Standard Test Method for Sound Absorption and Sound Absorption Coefficients by the Reverberation Room Method
- D. ASTM C 612 - Standard Specification for Mineral Fiber Block and Board Thermal Insulation.
- E. ASTM D 3574 - Standard Test Methods for Flexible Cellular Materials.
- F. ASTM E 795 - Standard Practices for Mounting Test Specimens During Sound Absorption Tests.

1.4 SUBMITTALS

- A. Product Data: For each type of panel edge, core material, and mounting indicated.
- B. Shop Drawings: For each panel type, include mounting devices and details. Include elevations showing panel sizes and overall pattern/ installation. Indicate panel edge and core materials.
- C. Coordination Drawings: Show intersections with wall base, shelves, countertops, doors, electrical outlets and switches, thermostats, lighting fixtures, air outlets and inlets, speakers, sprinklers, access panels and other adjacent work.
- D. Samples for Initial Selection: For each type of fabric facing material from acoustical wall panel manufacturer's full range.
- E. Samples for Verification: For the following products. Prepare Samples from same material to be used for the Work.
 - 1. Acoustical panel material: 3 inch by 3 inch sample from dye lot to be used for the Work, illustrating panel edge treatment.
 - 2. Mounting Device: drawing illustrating mounting method and sample to illustrate finish.
- F. Product Certificates: For each type of acoustical panel, signed by product manufacturer.
- G. Qualification Data: For fabricator and installer.
- H. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency, for each type of acoustical panel.
- I. Maintenance Data: For acoustical panels to include in maintenance manuals. Include panel manufacturers' written cleaning and stain-removal recommendations.
- J. Warranty: Product warranty specified in this Section.

1.5 QUALITY ASSURANCE

- A. Fabricator Qualifications: Shop that employs skilled workers who custom-fabricate products similar to those required for this Project and whose products have a record of successful in-service performance.
- B. Source Limitations: Obtain acoustical wall panels (and Acoustical Ceiling Panels) through one source from a single manufacturer.
- C. Fire-Test-Response Characteristics: Provide acoustical wall panels with the following surface-burning characteristics as determined by testing identical products per ASTM E 84 by UL or another testing and inspecting agency acceptable to authorities having jurisdiction.
 - 1. Flame-Spread Index: 25 or less.

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ACOUSTIC PANELS

2. Smoke-Developed Index: 450 or less.
3. Finishes to provide a Class I fire rating as per ASTM E 84.

1.6 DELIVERY, STORAGE, AND PROTECTION

- A. Protect acoustical units from moisture during shipment, storage, and handling. Deliver in factory-wrapped bundles; do not open bundles until units are needed for installation. Ensure all supplied hardware, material, and components are maintained until product is fully installed.
- B. Store units flat, in dry, well-ventilated space; do not stand on end.
- C. Protect edges from damage.
- D. Acclimatize product for minimum 24 hours at temperature and humidity approximately that of occupancy prior to installation.
- E. Comply with manufacturer's written instructions for delivery, storage and protection or materials.

1.7 PROJECT CONDITIONS

- A. Environmental Limitations: Do not install acoustical wall panels until spaces are enclosed and weatherproof, wet work in spaces is complete and dry, work above ceilings is complete, and ambient temperature and humidity conditions are maintained at the levels indicated for Project when occupied for its intended use.
- B. Air-Quality Limitations: Protect acoustical wall panels from exposure to airborne odors, such as tobacco smoke, and install panels under conditions free from odor contamination of ambient air.
- C. Field Measurements: Verify locations of acoustical wall panels by field measurements before fabrication and indicate measurements on Shop Drawings. Coordinate location of materials and trades with acoustical panel layout.
- D. Ensure that Design Submittal signoffs and other required information are supplied in time to prevent interruption of construction process. Ensure that products of this section are supplied to affected trades in time to prevent interruptions.

1.8 EXTRA MATERIALS

- A. Furnish extra materials described below, before installation begins, that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
 1. Acoustical PET Material: For each color installed provide number of panels equal to 10 percent of amount installed, but no fewer than 10 yards.
 2. Acoustical Wall Panel Mounting Devices: Full-size units equal to 5 percent of amount installed, but no fewer than 5 attachment devices.

1.9 WARRANTY

- A. Provide manufacturer's standard form in which manufacturer agrees to repair or replace components of acoustical wall panels that fail in performance, materials, or workmanship within specified warranty period.
 1. Failure in performance includes, but is not limited to, acoustical performance.
 2. Failures in materials include, but are not limited to, sagging, distorting, or warping of core.
 3. Warranty Period: Minimum Two years from date of Substantial Completion.

PART 2 – PRODUCTS

2.1 POLYESTER (PET) FELT ACOUSTICAL PANELS

- A. Manufacturers
 1. Basis of Design Manufacturer: TURF; 2000 Fox Ln. Elgin, Illinois, 60123; Phone: 844.TURF.OMG (844.887.3664); Email: hello@turf.design; Web: www.turf.design
 2. Substitutions: See Section 01600 - Product Requirements.

SECTION 09843

ACOUSTIC PANELS

2.2 SOUND-ABSORBING AND SOUND-DIFFUSING PANELS (AC-1, 2, 3)

- A. Basis of Design:
 - 1. Turf Design; Product: 'Wall Tile' <https://turf.design/>
- B. Material Minimum Performance Attributes:
 - 1. Surface Burning Characteristics: Flame spread index of 25 or less and smoke developed index of 450 or less, when tested in accordance with ASTM E84.
 - 2. UL Tested ASTM E-84: Class A
 - 3. Noise Reduction Coefficient (NRC):
 - a. Tested in accordance with ASTM C423 for Type A mounting, per ASTM E795.
 - b. 9MM Tile: Average NRC > 0.25
- C. Product Attributes:
 - 1. Panel Size: As indicated in Architectural construction drawings.
 - 2. Panel Thickness: 9 mm.
 - 3. Edges: Exposed felt, machined edge.
 - 4. Corners: Square, exposed felt, machined edge.
 - 5. Material: Polyester (PET) felt, 60% pre-consumer recycled
 - 6. Patterns and Colors: As indicated on Finish Legend in Architectural construction drawings.
 - 7. Mounting Method:
 - a. Installer applied adhesive as recommended by the manufacturer- back of PET panels to attach z-clips to panels. Z-strips and all associated hardware to attach panels to masonry walls. Mount z-strips horizontally every three feet centered on panels. Reference Architectural drawings for location and pattern.

2.3 FABRICATION

- A. General: CNC fabricate panels to sizes, configurations and patterns on 9 mm panels.
- B. Tolerances: Fabricate to finished tolerance of plus or minus 1/16 inch for thickness, overall length and width, and square-ness from corner to corner.

2.4 ACCESSORIES

- A. General: Provide components and accessories recommended or required by panel manufacturer to suit project conditions, including but not necessarily limited to the following:
 - 1. Metal panel clips.
 - 2. Metal "Z" clips.
- B. Back-Mounting Accessories: Manufacturer's standard or recommended accessories for securely mounting panels, of type and size indicated, to substrates as indicated.

PART 3 – EXECUTION

3.1 EXAMINATION

- A. Examine PET material, substrates, and conditions, with Installer present, for compliance with requirements, installation tolerances, and other conditions affecting performance of acoustical wall panels.
 - 1. Proceed with installation only after unsatisfactory conditions have been corrected.

SECTION 09843

ACOUSTIC PANELS

3.2 INSTALLATION

- A. Install acoustical units in locations indicated, following manufacturer's installation instructions and in accordance with local jurisdiction authorities.
- B. Wall surface to be smooth, cleaned, and dry prior to installation of tile product.
- C. Directly adhere to tile to wall surface with mechanical fasteners.
- D. Align panels accurately, with edges plumb and edges level. Scribe to fit accurately at adjoining work and penetrations.
- E. Install acoustical units to construction tolerances of plus or minus 1/16 inch for the following:
 - 1. Plumb and level.
 - 2. Flatness.
 - 3. Width of joints.

3.3 CLEANING AND PROTECTION

- A. Clean felt facing upon completion of installation from dust and other foreign materials, following manufacturer's instructions.
- B. Vacuum occasionally to remove any particulate matter and air-borne debris or dust. Compressed air can be used to dust the material in difficult to reach areas or for large assemblies.
- C. Provide protection of installed acoustical panels until completion of the work.
- D. Replace panels that cannot be cleaned and repaired to satisfaction of the Architect.

END OF SECTION

SECTION 09900

PAINTS AND COATINGS

PART 1 – GENERAL

1.1 SECTION INCLUDES

- A. Surface preparation.
- B. Field application of paints, stains, varnishes, and other coatings.
- C. See Schedule - Surfaces to be finished, at end of Section.

1.2 RELATED SECTIONS

- A. Section 03300 – Cast in Place Concrete.
- B. Section 04810 – Unit Masonry Assemblies
- C. Section 05500 – Metal Fabrications: Shop-primed items.

1.3 REFERENCES

- A. Unless noted otherwise, the most current issue of the reference shall be used.
- B. ASTM D 16 - Standard Terminology for Paint, Related Coatings, Materials, and Applications.

1.4 DEFINITIONS

- A. Conform to ASTM D 16 for interpretation of terms used in this section.

1.5 SUBMITTALS

- A. See Section 01300 - Administrative Requirements, for submittal procedures.
- B. Samples: Submit two paper chip samples, 4 x 4 inch in size illustrating range of colors and textures available for each surface finishing product scheduled.

1.6 QUALITY ASSURANCE

- A. Applicator Qualifications: Company specializing in performing the work of this section with minimum five years' experience.

1.7 REGULATORY REQUIREMENTS

- A. Comply with applicable code for flame and smoke rating requirements for products and finishes.

1.8 DELIVERY, STORAGE, AND PROTECTION

- A. Deliver products to site in sealed and labeled containers; inspect to verify acceptability.
- B. Container Label: Include manufacturer's name, type of paint, brand name, lot number, brand code, coverage, surface preparation, drying time, cleanup requirements, color designation, and instructions for mixing and reducing.
- C. Paint Materials: Store at minimum ambient temperature of 45 degrees F and a maximum of 90 degrees F, in ventilated area, and as required by manufacturer's instructions.

1.9 ENVIRONMENTAL REQUIREMENTS

- A. Do not apply materials when surface and ambient temperatures are outside the temperature ranges required by the paint product manufacturer.
- B. Do not apply exterior coatings during rain or snow, or when relative humidity is outside the humidity ranges required by the paint product manufacturer.
- C. Minimum Application Temperatures for Latex Paints: 45 degrees F for interiors; 50 degrees F for exterior; unless required otherwise by manufacturer's instructions.
- D. Minimum Application Temperature for Varnish Finishes: 65 degrees F for interior or exterior, unless required otherwise by manufacturer's instructions.
- E. Provide lighting level of 80 ft candles measured mid-height at substrate surface.

SECTION 09900

PAINTS AND COATINGS

PART 2 – PRODUCTS

2.1 MANUFACTURERS

- A. Refer to manufacturers listed below for each paint type.
- B. No Substitutions

2.2 PAINTS AND COATINGS – GENERAL

- A. Paints and Coatings: Ready mixed, except field-catalyzed coatings. Prepare pigments:
 - 1. To a soft paste consistency, capable of being readily and uniformly dispersed to a homogeneous coating.
 - 2. For good flow and brushing properties.
 - 3. Capable of drying or curing free of streaks or sags.

2.3 PAINTS AND COATINGS – GENERAL

- A. Paints and Coatings: Ready mixed, except field-catalyzed coatings. Prepare pigments:
 - 1. To a soft paste consistency, capable of being readily and uniformly dispersed to a homogeneous coating.
 - 2. For good flow and brushing properties.
 - 3. Capable of drying or curing free of streaks or sags.

2.4 PAINT SYSTEMS - EXTERIOR

- A. Paint ME-OP-3A - Ferrous Metals, Unprimed, Alkyd, 3 Coat:
 - 1. One coat of alkyd primer.
 - a. Sherwin-Williams Kem Bond HS, B50WZ Series
 - 2. Semi-gloss: Two coats of alkyd enamel.
 - a. Sherwin Williams SHER-CRYL High Performance Acrylic- SW9102 the name is Quinoa semi-gloss Paint MgE-OP-3A - Galvanized Metals, Alkyd, 3 Coat:
 - 3. Semi-gloss: Alkyd enamel.
 - a. Sherwin-Williams Sherwin-Williams B53-1150 series
- B. Paint for HM Storm Shelter Doors
 - 1. Ultra Spec HP D.T.M. Acrylic Semi-Gloss HP29

2.5 PAINT SYSTEMS – INTERIOR

- A. Paint CI-OP-3L - Concrete/Masonry, Opaque, Latex, 3 Coat:
 - 1. Primer:
 - a. PPG: *SPEEDHIDE* Interior/Exterior Masonry Block Filler
 - 2. Semi-gloss: Latex enamel.
 - a. PPG: Speedhide Zero
- B. Paint MI-OP-3A - Ferrous Metals, Unprimed, Alkyd, 3 Coat:
 - 1. One coat of alkyd primer.
 - a. Sherwin-Williams: Kem Bond HS Metal Primer, B50WZ Series
- C. Paint MI-OP-2A - Ferrous Metals, Primed, Alkyd, 2 Coat:
 - 1. Touch-up with alkyd primer.
 - a. Sherwin-Williams: Kem Bond HS Metal Primer, B50WZ Series
 - 2. Semi-gloss: Two coats of alkyd enamel.
 - a. Sherwin-Williams: Sherwin-Williams: B53-1150 series (semi-gloss)
- D. Paint GI-OP-3L - Gypsum Board/Plaster, Latex, 3 Coat:
 - 1. One coat of fast-drying latex primer sealer.
 - a. PPG: ProMar 400 Interior Latex Primer, B28W8400
 - 2. Eggshell: Vinyl Acrylic Latex.
 - a. PPG: Speedhide Zero
- E. Paint MI-OP-3E - Ferrous Metals, Modified Alkyd (Dry Fall Flat), 3 Coat:
 - 1. Prime exposed metal surfaces and touch-up existing finish with primer compatible with substrate. After removing rust prime rust areas with Primer from Sherwin Williams Eggshell: Two Coats of Modified Epoxy Dry Fall Flat – B48W60 Brilliant White

SECTION 09900

PAINTS AND COATINGS

- F. Paint WI-TR-VS - Wood, Transparent, Varnish, Stain (match WD-1 and WD-2):
 - 1. Filler coat.
 - 2. One coat of stain; All colors to be selected by Architect from manufacturer's full range-maximum 3 colors.
 - a. Benjamin Moore: Benwood® Interior Wood Finishes Waterborne Stain 205
 - b. Sherwin-Williams: WoodClassics 250 Oil Stain, A49 Series
 - c. Glidden Professional: GP1700V WoodPride Water-Based Interior Wood Stain.
 - 3. Satin: Two coats of varnish.
 - a. Benjamin Moore & Co.: Benwood Finishes® Polyurethane Finish Low Lustre C435
 - b. Sherwin Williams WoodClassics WB Polyurethane Satin, A68F90
 - c. Glidden Professional: GP1802 Woodpride Interior Satin, Water-Based Varnish.

2.6 ACCESSORY MATERIALS

- A. Accessory Materials: Linseed oil, shellac, turpentine, paint thinners and other materials not specifically indicated but required to achieve the finishes specified; commercial quality.
- B. Patching Material: Latex filler.
- C. Fastener Head Cover Material: Latex filler.

PART 3 – EXECUTION

3.1 EXAMINATION

- A. Verify that surfaces are ready to receive Work as instructed by the product manufacturer.
- B. Examine surfaces scheduled to be finished prior to commencement of work. Report any condition that may potentially affect proper application.
- C. Test shop-applied primer for compatibility with subsequent cover materials.
- D. Measure moisture content of surfaces using an electronic moisture meter. Do not apply finishes unless moisture content of surfaces are below the following maximums:
 - 1. Plaster and Gypsum Board: 12 Percent
 - 2. Masonry, Concrete and Concrete Masonry Unit: 12 Percent
 - 3. Interior Wood: 15 Percent, measured in accordance with ASTM D 4442.
 - 4. Concrete Floors: 8 Percent.

3.2 PREPARATION

- A. Surface Appurtenances: Remove or mask electrical plates, hardware, light fixture trim, escutcheons, and fittings prior to preparing surfaces or finishing.
- B. Surfaces: Correct defects and clean surfaces which affect work of this section. Remove or repair existing coatings that exhibit surface defects.
- C. Marks: Seal with shellac those which may bleed through surface finishes.
- D. Impervious Surfaces: Remove mildew by scrubbing with solution of tetra-sodium phosphate and bleach. Rinse with clean water and allow surface to dry.
- E. Concrete and Unit Masonry Surfaces to be Painted: Remove dirt, loose mortar, scale, salt or alkali powder, and other foreign matter. Remove oil and grease with a solution of tri-sodium phosphate; rinse well and allow to dry. Remove stains caused by weathering of corroding metals with a solution of sodium metasilicate after thoroughly wetting with water. Allow to dry.
- F. Gypsum Board Surfaces to be Painted: Fill minor defects with filler compound. Spot prime defects after repair.
- G. Galvanized Surfaces to be Painted: Remove surface contamination and oils and wash with solvent. Apply coat of etching primer.
- H. Uncoated Steel and Iron Surfaces to be Painted: Remove grease, mill scale, weld splatter, dirt, and rust. Where heavy coatings of scale are evident, remove by hand wire brushing or sandblasting; clean by washing with solvent. Apply a treatment of phosphoric acid solution, ensuring weld joints, bolts, and nuts are similarly cleaned. Prime paint entire surface; spot prime after repairs.

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PAINTS AND COATINGS

- I. Shop-Primed Steel Surfaces to be Finish Painted: Sand and scrape to remove loose primer and rust. Feather edges to make touch-up patches inconspicuous. Clean surfaces with solvent. Prime bare steel surfaces. Re-prime entire shop-primed item.
- J. Interior Wood Items to Receive Transparent Finish: Wipe off dust and grit prior to sealing, seal knots, pitch streaks, and sappy sections with sealer. Fill nail holes and cracks after sealer has dried; sand lightly between coats. Prime concealed surfaces with gloss varnish reduced 25 percent with thinner.
- K. Wood Doors to be Field-Finished: Seal wood door top and bottom edge surfaces with clear sealer.
- L. Metal Doors to be painted: Prime metal door top and bottom edge surfaces.

3.3 APPLICATION

- A. Apply products in accordance with manufacturer's instructions.
- B. Do not apply finishes to surfaces that are not dry. Allow applied coats to dry before next coat is applied.
- C. Apply each coat to uniform appearance. Apply each coat of paint slightly darker than preceding coat unless otherwise approved.
- D. Vacuum clean surfaces of loose particles. Use tack cloth to remove dust and particles just prior to applying next coat.

3.4 FINISHING MECHANICAL AND ELECTRICAL EQUIPMENT

- A. Refer to Mechanical and Electrical specifications for schedule of color coding of equipment, duct work, piping, and conduit.
- B. Remove unfinished louvers, grilles, covers, and access panels on mechanical and electrical components and paint separately.
- C. Reinstall electrical cover plates, hardware, light fixture trim, escutcheons, and fittings removed prior to finishing.

3.5 CLEANING

- A. Collect waste material, which may constitute a fire hazard, place in closed metal containers, and remove daily from site.

3.6 SCHEDULE - SURFACES TO BE FINISHED

- A. Do Not Paint or Finish the Following Items:
 - 1. Items fully factory-finished unless specifically noted.
 - 2. Fire rating labels, equipment serial number and capacity labels.
- B. Paint the surfaces described below under Schedule - Paint Systems.
- C. Mechanical and Electrical: Use paint systems defined for the substrates to be finished.
 - 1. Paint all insulated and exposed pipes occurring in finished areas to match background surfaces, unless otherwise indicated.
 - 2. Paint shop-primed items occurring in finished areas.
 - 3. Paint interior surfaces of air ducts and convactor and baseboard heating cabinets that are visible through grilles and louvers with one coat of flat black paint to visible surfaces.
 - 4. Paint dampers exposed behind louvers, grilles, and convactor and baseboard cabinets to match face panels.

3.7 SCHEDULE - PAINT SYSTEMS

- A. Concrete, Concrete Block, Brick Masonry: Finish all surfaces exposed to view.
 - 1. Exterior: CE-OP-3A, semi-gloss.
 - 2. Interior: CI-OP-3L, semi-gloss.
- B. Gypsum Board: Finish all surfaces exposed to view.
 - 1. Interior Ceilings and Bulkheads: GI-OP-3L, semi-gloss
 - 2. Interior Walls: GI-OP-3A, semi-gloss.
- C. Steel Doors and Frames: Finish all surfaces exposed to view; MI-OP-3A, semi-gloss.

SECTION 09900

PAINTS AND COATINGS

- D. Steel Fabrications: Finish all surfaces exposed to view; MI-OP-3A, semi-gloss.
 - 1. Exterior: ME-OP-3A, semi-gloss; finish all surfaces, including concealed surfaces, before installation.
 - 2. Interior: MI-OP-3L, semi-gloss.
- E. Shop-Primed Metal Items: Finish all surfaces exposed to view.
 - 1. Finish the following items:
 - a. Exposed surfaces of lintels.
 - b. Elevator pit ladders.
 - c. Exposed surfaces of steel stairs and railings.
 - d. Mechanical equipment.
 - e. Electrical equipment.

3.8 SCHEDULE – PAINT COLORS

- A. Refer to Finish Legend on Architectural Drawings for schedule of paint colors and locations.
- B. Storm Doors paint – Color to match adjacent facebrick

END OF SECTION

SECTION 09960

EPOXY BROADCAST STANDARD FINISH WITH URETHANE TOPCOAT (Q 28)

PART 1 – GENERAL

1.1 SUMMARY

- A. This section includes the following:
 - 1. Quartz (Epoxy) flooring system as shown on the drawings and in schedules.

1.2 RELATED SECTIONS

- A. Section 03300: Cast-in-Place Concrete
- B. Section 03505: Self Leveling Underlayment

1.3 SYSTEM DESCRIPTION

- A. The work shall consist of preparation of the substrate, the furnishing and application of an epoxy based multi roller applied flooring system with Q 28 colored quartz aggregate and urethane topcoat. The system shall have the color and texture as specified by the Owner with a nominal thickness of 1/8 inch. It shall be applied to the prepared area(s) as defined in the plans strictly in accordance with the Manufacturer's recommendations.
- B. Cove base (if required) to be applied where noted on plans and per manufacturers standard details unless otherwise noted.

1.4 SUBMITTALS

- A. Product Data: Latest edition of Manufacturer's literature including performance data and installation procedures.
- B. Manufacturer's Material Safety Data Sheet (MSDS) for each product being used.
- C. Samples: 2 inch square sample of the proposed system. Color, texture, and thickness shall be representative of overall appearance of finished system.

1.5 QUALITY ASSURANCE

- A. The Manufacturer shall have a minimum of 10 years' experience in the production, sales, and technical support of epoxy and urethane industrial flooring and related materials.
- B. The Applicator shall have been approved by the flooring system manufacturer in all phases of surface preparation and application of the product specified.
- C. No requests for substitutions shall be considered that would change the generic type of the specified System.
- D. System shall be in compliance with requirements of United States Department of Agriculture (USDA), Food, Drug Administration (FDA), and local Health Department.
- E. System shall be in compliance with the Indoor Air Quality requirements of California section 01350 as verified by a qualified independent testing laboratory.
- F. A pre-installation conference shall be held between Applicator, General Contractor and the Owner to review and clarification of this specification, application procedure, quality control, inspection and acceptance criteria and production schedule.

1.6 PRODUCT DELIVERY, STORAGE, AND HANDLING

- A. Packing and Shipping
 - 1. All components of the system shall be delivered to the site in the Manufacturer's packaging, clearly identified with the product type and batch number.
- B. Storage and Protection
 - 1. The Applicator shall be provided with a storage area for all components. The area shall be between 60 F and 90 F, dry, out of direct sunlight and in accordance with the Manufacturer's recommendations and relevant health and safety regulations.
 - 2. Copies of Material Safety Data Sheets (MSDS) for all components shall be kept on site for review by the Engineer or other personnel.
- C. Waste Disposal
 - 1. The Applicator shall be provided with adequate disposal facilities for non-hazardous waste generated during installation of the system.

SECTION 09960

EPOXY BROADCAST STANDARD FINISH WITH URETHANE TOPCOAT (Q 28)

1.7 PROJECT CONDITIONS

- A. Site Requirements
 - 1. Application may proceed while air, material and substrate temperatures are between 60 F and 90 F providing the substrate temperature is above the dew point. Outside of this range, the Manufacturer shall be consulted.
 - 2. The relative humidity in the specific location of the application shall be less than 85 % and the surface temperature shall be at least 5 F above the dew point.
 - 3. The Applicator shall ensure that adequate ventilation is available for the work area.
 - 4. The Applicator shall be supplied with adequate lighting equal to the final lighting level during the preparation and installation of the system.
- B. Conditions of new concrete to be coated with epoxy material.
 - 1. Concrete shall be moisture cured for a minimum of 7 days and have fully cured a minimum of twenty eight days in accordance with ACI-308 prior to the application of the coating system pending moisture tests.
 - 2. Concrete shall have a flat rubbed finish, float or light steel trowel finish (a hard steel trowel finish is neither necessary nor desirable).
 - 3. Sealers and curing agents should not to be used.
 - 4. Concrete surfaces on grade shall have been constructed with a vapor barrier to protect against the effects of vapor transmission and possible delamination of the system.
- C. Safety Requirements
 - 1. All open flames and spark-producing equipment shall be removed from the work area prior to commencement of application.
 - 2. "No Smoking" signs shall be posted at the entrances to the work area.
 - 3. The Owner shall be responsible for the removal of foodstuffs from the work area.
 - 4. Non-related personnel in the work area shall be kept to a minimum.

1.8 WARRANTY

- A. Manufacture warrants that material shipped to buyers at the time of shipment substantially free from material defects and will perform substantially to published literature if used in accordance with the latest prescribed procedures and prior to the expiration date.
- B. Manufacture liability with respect to this warranty is strictly limited to the value of the material purchase.

PART 2 – PRODUCTS

2.1 FLOORING

- A. Basis of Design: Dur-A-Flex, Inc, Dur-A-Quartz, Epoxy-Based seamless flooring system.
 - 1. System Materials:
 - a. Primer: Dur-A-Flex, Inc, Dur-A-Glaze #4 WB resin and hardener.
 - b. Broadcast Coats: Dur-A-Flex, Inc, Dur-A-Glaze #4 resin and hardener.
 - c. The quartz aggregate shall be Dur-A-Flex, Inc. Q-28 colored quartz aggregate (district standard color is Q28-21 – grey and black color).
 - d. Grout coat: Dur-A-Flex, Inc. Dur-A-Glaze #4 resin and Water Clear hardener.
 - e. Topcoat: Dur-A-Flex, Inc. Armor Top resin and hardener.
 - 2. Patch Materials
 - a. Shallow Fill and Patching: Use Dur-A-Flex, Inc. Dur-A-Glaze Rapid-Patch.
 - b. Deep Fill and Sloping Material (over ¼ inch): Use Dur-A-Flex, Inc. Dur-A-Crete.
- B. Or approved equal.

2.2 MANUFACTURER

- A. Dur-A-Flex, Inc., 95 Goodwin Street, East Hartford, CT 06108, Phone: (860) 528-9838, Fax: (860) 528-2802

SECTION 09960

**EPOXY BROADCAST STANDARD FINISH
WITH URETHANE TOPCOAT (Q 28)**

2.3 PRODUCT REQUIREMENTS

A. Primer	Dur-A-Glaze #4 WB
1. Percent Solids	56 %
2. VOC	2 g/L
3. Bond Strength to Concrete ASTM D 4541	550 psi, substrates fails
4. Hardness, ASTM D 3363	3H
5. Elongation, ASTM D 2370	9 %
6. Flexibility (1/4: Cylindrical mandrel), ASTM D 1737	Pass
7. Impact Resistance, MIL D-2794	>160
8. Abrasion Resistance ASTM D 4060 CS 17 wheel, 1,000 g Load	30 mg loss
B. Broadcast Coat and Grout Coat	Dur-A-Glaze #4
1. Percent Solids	100 %
2. VOC	3.8 g/L
3. Compressive Strength, ASTM D 695	11,200 psi
4. Tensile Strength, ASTM D 638	2,100 psi
5. Flexural Strength, ASTM D 790	5,100 psi
6. Abrasion Resistance, ASTM D 4060 C-10 Wheel, 1,000 gm load, 1,000 cycles	29 mg loss
7. Flame Spread/NFPA-101, ASTM E 84	Class A
8. Impact Resistance MIL D-24613	0.0007 inches, no cracking or delamination
9. Water Absorption. MIL D-24613	Nil
10. Potlife @ 70 F	20 minutes
C. Topcoat	Armor Top
1. Percent Solids	95 %
2. VOC	0 g/L
3. Tensile Strength, ASTM D 2370	7,000 psi
4. Adhesion, ASTM 4541	Substrate Failure
5. Hardness, ASTM D 3363	4H
6. 60° Gloss ASTM D 523	70
7. Abrasion Resistance, ASTM D4060 CS 17 wheel (1,000 g load) 1,000 cycles	Gloss Satin 4 8 mg loss with grit 10 12 mg loss without grit
8. Pot Life, 70 F, 50% RH	2 Hours
9. Full Chemical Resistance	7 days

PART 3 – EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas and conditions, with Applicator present, for compliance with requirements for maximum moisture content, installation tolerances and other conditions affecting flooring performance.
 - 1. Verify that substrates and conditions are satisfactory for flooring installation and comply with requirements specified.

3.2 PREPARATION

- A. General
 - 1. New and existing concrete surfaces shall be free of oil, grease, curing compounds, loose particles, moss, algae growth, laitance, friable matter, dirt, and bituminous products.
 - 2. Moisture Testing: Perform tests recommended by manufacturer and as follows.

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EPOXY BROADCAST STANDARD FINISH WITH URETHANE TOPCOAT (Q 28)

- a. Perform anhydrous calcium chloride test ASTM F 1869-98. Application will proceed only when the vapor/moisture emission rates from the slab is less than and not higher than 3 lbs/1,000 sf/24 hrs.
 - b. Perform relative humidity test using is situ probes, ASTM F 2170. Proceed with installation only after substrates have a maximum 75% relative humidity level measurement.
 - c. If the vapor emission exceeds 75 % relative humidity or 3 lbs/1,000 sf/24 hrs then Dur-A-Flex, Inc Dur-A-Glaze MVP Primer moisture mitigation system must be installed prior to resinous flooring installation. Slab-on grade substrates without a vapor barrier may also require the moisture mitigation system.
3. There shall be no visible moisture present on the surface at the time of application of the system. Compressed oil-free air and/or a light passing of a propane torch may be used to dry the substrate.
 4. Mechanical surface preparation
 - a. Shot blast all surfaces to receive flooring system with a mobile steel shot, dust recycling machine (Blastrac or equal). All surface and embedded accumulations of paint, toppings hardened concrete layers, laitance, power trowel finishes and other similar surface characteristics shall be completely removed leaving a bare concrete surface having a minimum profile of CSP 4-5 as described by the International Concrete Repair Institute.
 - b. Floor areas inaccessible to the mobile blast machines shall be mechanically abraded to the same degree of cleanliness, soundness and profile using diamond grinders, needle guns, bush hammers, or other suitable equipment.
 - c. Where the perimeter of the substrate to be coated is not adjacent to a wall or curb, a minimum 1/4 inch key cut shall be made to properly seat the system, providing a smooth transition between areas. The detail cut shall also apply to drain perimeters and expansion joint edges.
 - d. Cracks and joints (non-moving) greater than 1/8 inch wide are to be chiseled or chipped-out and repaired per manufacturer's recommendations.
 5. At spalled or worn areas, mechanically remove loose or delaminated concrete to a sound concrete and patch per manufactures recommendations.

3.3 APPLICATION

A. General

1. The system shall be applied in six distinct steps as listed below:
 - a. Substrate preparation
 - b. Priming
 - c. First broadcast coat application with first aggregate broadcast
 - d. Second broadcast coat with second aggregate broadcast
 - e. Grout coat application, sand floor (if required)
 - f. Topcoat application
2. Immediately prior to the application of any component of the system, the surface shall be dry and any remaining dust or loose particles shall be removed using a vacuum or clean, dry, oil-free compressed air.
3. The handling, mixing and addition of components shall be performed in a safe manner to achieve the desired results in accordance with the Manufacturer's recommendations.
4. The system shall follow the contour of the substrate unless pitching or other leveling work has been specified by the Architect.
5. A neat finish with well-defined boundaries and straight edges shall be provided by the Applicator.

B. Primer

1. The primer shall consist of a liquid resin and hardener that is mixed at the ratio of 1 part resin to 4 parts hardener per the manufacturer's instructions.
2. The primer shall be applied by 1/8 inch notched squeegee and back rolled at the rate of 200-250 sf/gal to yield a dry film thickness of 4 mils.

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EPOXY BROADCAST STANDARD FINISH WITH URETHANE TOPCOAT (Q 28)

- C. Broadcast Coat
 - 1. The broadcast coat shall be applied as a double broadcast system as specified by the Architect.
 - 2. The broadcast coat shall be comprised of two components, a resin, and hardener as supplied by the Manufacturer and mixed in the ratio of 2 parts resin to 1 part hardener.
 - 3. The resin shall be added to the hardener and thoroughly mixed by suitably approved mechanical means.
 - 4. The broadcast coat shall be applied over horizontal surfaces using "v" notched squeegee and back rolled at the rate of 90-100 sf/gal.
 - 5. Colored quartz aggregate shall be broadcast to excess into the wet material at the rate of 0.5 lbs/sf.
 - 6. Allow material to fully cure. Vacuum, sweep and/or blow to remove all loose aggregate.
 - 7. Apply a second coat of resin with a coverage rate of 90-100 sf/gal and broadcast aggregate to excess at the rate of 0.5 lbs/sf.
 - 8. Allow material to fully cure. Vacuum, sweep and/or blow to remove all loose aggregate.
- D. Grout Coat
 - 1. The grout coat shall be comprised of a liquid resin and a liquid hardener that is mixed in the ratio of 1 part hardener to 2 parts resin and installed per the manufacturer's recommendations.
 - 2. The grout coat shall be squeegee applied and back rolled with a coverage rate of 90-100 sf/gal.
- E. Topcoat
 - 1. The topcoat of Armor Top shall be roller applied at the rate of 500 sf/gal to yield a dry film thickness of 3 mils.
 - 2. The topcoat shall be comprised of a liquid resin, hardener and grit that is mixed per the manufacturer's instructions.
 - 3. The finish floor will have a nominal thickness of 1/8 inch.

3.4 FIELD QUALITY CONTROL

- A. Tests, Inspection
 - 1. The following tests shall be conducted by the Applicator:
 - a. Temperature
 - 1) Air, substrate temperatures and, if applicable, dew point.
 - b. Coverage Rates
 - 1) Rates for all layers shall be monitored by checking quantity of material used against the area covered.

3.5 CLEANING AND PROTECTION

- A. Cure flooring material in compliance with manufacturer's directions, taking care to prevent their contamination during stages of application and prior to completion of the curing process.
- B. Remove masking. Perform detail cleaning at floor termination, to leave cleanable surface for subsequent work of other sections.

END OF SECTION

SECTION 10211

TOILET COMPARTMENTS (HDPE)

PART 1 – GENERAL

1.1 SECTION INCLUDES

- A. Solid plastic partitions.

1.2 RELATED SECTION

- A. Section 05500 - Metal Fabrications: Concealed steel support members.
- B. Section 06114 - Wood Blocking/Faming
- C. Section 10800 - Toilet Accessories.

1.3 REFERENCES

- A. ASTM International: ASTM E 84 - Standard Test Method for Surface Burning Characteristics of Building Materials.
- B. National Fire Protection Association: NFPA 286 - Standard Methods of Fire Test for Evaluating Contribution of Wall and Ceiling Interior Finish to Room Fire Growth.
- C. United States Green Building Council (USGBC): LEED Green Building Rating System.

1.4 SUBMITTALS

- A. Submit under provisions of Section 01300.
- B. [Product Data]: Manufacturer's data sheets on each product to be used, including:
 - 1. Literature indicating typical panel, pilaster, door, hardware and fastening.
 - 2. Preparation instructions and recommendations.
 - 3. Storage and handling requirements and recommendations.
 - 4. Installation methods.
- C. Shop Drawings:
 - 1. Dimensioned plans indicating layout of toilet compartments.
 - 2. Dimensioned elevations indicating heights of doors, pilasters, separation partitions, and other components; indicate locations and sizes of openings in compartment separation partitions for toilet and bath accessories to be installed in partitions; indicate floor and ceiling clearances.
 - 3. Details indicating anchoring components (bolt layouts) and methods for project conditions; indicate components required for installation, but not supplied by toilet compartment manufacturer.
- D. Selection Samples: For each finish product specified, one complete set of color selection guides representing manufacturer's full range of available colors, textures and patterns.
- E. Verification Samples: For each finish product specified, two samples, minimum size 6 inches (150 mm) square, representing actual product, color, texture and pattern.
- F. Manufacturer's Certificates: Certify products meet or exceed specified requirements.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Deliver, store and handle materials and products in strict compliance with manufacturer's instructions and recommendations and industry standards.
- B. Store products indoors in manufacturers' or fabricator's original containers and packaging, with labels clearly identifying product name and manufacturer. Protect from damage.
- C. Lay cartons flat, with adequate support to ensure flatness and to prevent damage to pre-finished surfaces.
- D. Do not store where ambient temperature exceeds 120 degrees F (49 degrees C).

1.6 PROJECT CONDITIONS

- A. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's absolute limits.
- B. Do not deliver materials or begin installation until building is enclosed, with complete protection from outside weather, and building temperature maintained at a minimum of 60 degrees F (15.6 degrees C).

SECTION 10211

TOILET COMPARTMENTS (HDPE)

1.7 WARRANTY

- A. Manufacturers Standard Warranty: For Solid Plastic HDPE Material: Against breakage, corrosion, and delamination for 15 years.

1.8 COORDINATION

- A. Coordinate Work with placement of support framing and anchors in walls and ceilings.

PART 2 – PRODUCTS

2.1 MANUFACTURERS

- A. Acceptable Manufacturer: Accurate Partitions Corp., Lyons, IL; www.accuratepartitions.com
 - 1. As provided by: David McDoniel, Sales representative
161 Tower Road, Ste. G
Burr Ridge, IL 60527
630-323-8742 (T); 630-323-8282 (F)
dmcdoniel@specialtiesdirect.com
 - 2. Substitutions: Not permitted.

2.2 SOLID PLASTIC TOILET COMPARTMENTS

- A. Doors, Panels, Screens, and Pilasters: Single sheet solid, homogenous HDPE plastic material formed from waterproof, non-absorbent, high-density polyethylene resins; mark-resistant self-lubricating surface; edges finished smooth.
 - 1. Material: Solid, homogenous HDPE; 1 inch (25 mm) thick.
 - 2. Edges: 1/4 inch (6 mm) radius machined edges.
 - 3. Heat Sink: Aluminum heat sink, to dissipate heat from incendiary devices used by vandals, attached to bottom of doors and panels.
- B. Finish: Pebble-textured homogenous color throughout material.
 - 1. Color: Folkstone Grey 9400
- C. Provide continuous stainless steel brackets in lieu of stirrup brackets.
- D. Provide as shown on drawings – between urinals, sinks and toilet partitions, etc.

PART 3 – EXECUTION

3.1 EXAMINATION AND PREPARATION

- A. Inspect and prepare substrates using the methods recommended by the manufacturer for achieving best result for the substrates under project conditions. Clean surfaces thoroughly prior to installation.
- B. Do not proceed with installation until substrates have been prepared using the methods recommended by the manufacturer and deviations from manufacturer's recommended tolerances are corrected. Commencement of installation constitutes acceptance of conditions.
- C. If preparation is the responsibility of another installer, notify Architect in writing of deviations from manufacturer's recommended installation tolerances and conditions.
 - 1. Verify dimensions of areas to receive compartments.
 - 2. Verify locations of built-in framing, anchorage, bracing, and plumbing fixtures.

3.2 INSTALLATION

- A. Install in accordance with approved shop drawings and manufacturer's instructions.
- B. Fasten components to adjacent materials and to other components using purpose-designed fastening devices.
- C. Adjust pilaster anchors for substrate variations; conceal anchors with pilaster shoes.
- D. Equip each compartment door with top and bottom hinges and door latch.
- E. Install door strike keeper on pilasters in alignment with door latch.

SECTION 10211

TOILET COMPARTMENTS (HDPE)

F. Equip each compartment door with one bumper

1. **Part # 40-2511710**

G. Installation Tolerances:

1. Maximum variations from plumb or level: 1/8 inch (3 mm).
2. Clearance between wall surface and panels or pilasters: 1-1/2 inch (38 mm) maximum.

3.3 ADJUSTING

- A. Adjust and align hardware to uniform clearance at vertical edge of doors.
- B. Adjust adjacent components for consistency of line or plane.

3.4 PROTECTION

- A. Protect installed products until completion of project.
- B. Touch-up, repair or replace damaged products before Substantial Completion.
- C. Remove factory protective coverings and clean finish surfaces in accordance with manufacturer's instructions before substantial completion.

END OF SECTION

SECTION 10350

FLAGPOLES

PART 1 – GENERAL

1.1 SECTION INCLUDES

- A. Aluminum Flagpoles
- B. Accessories

1.2 RELATED SECTIONS

- A. Section 03300 - Cast-In-Place Concrete: Concrete base and foundation construction.

1.3 PERFORMANCE REQUIREMENTS

- A. Flagpole with Flag Flying: Resistant without permanent deformation to 90 miles/hr wind velocity; nonsafety design factor of 2.5.

1.4 SUBMITTALS

- A. See Section 01300 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide data on pole, accessories, and configurations.
- C. Shop Drawings: Indicate detailed dimensions, base details, anchor requirements, and imposed loads.

1.5 QUALITY ASSURANCE

- A. Design flagpole foundation and anchoring under direct supervision of a Professional Structural Engineer experienced in design of this Work and licensed at the place where the Project is located.

1.6 DELIVERY, STORAGE, AND PROTECTION

- A. Spiral wrap flagpole with protective covering and pack in protective shipping tubes or containers.
- B. Protect flagpole and accessories from damage or moisture.

PART 2 – PRODUCTS

2.1 MANUFACTURER

- A. Flagpole: Pole Tech - Counter Balanced Tilting Pole
- B. No Substitutions.

2.2 FLAGPOLE

- A. Flagpole: Aluminum.
 - 1. Height: 25 feet
 - 2. Mounting: Ground mounted type.
 - 3. Design: Cone-tapered, adapted with counter-balanced tilt system.
 - 4. Halyard: External type.

2.3 POLE MATERIALS

- A. Aluminum: ASTM B221 (ASTM B 221M), 6063 alloy, T6 temper.

2.4 ACCESSORIES

- A. Finial Ball: Stainless steel, 6 inch diameter.
- B. Truck Assembly: Cast aluminum; revolving, stainless steel ball bearings, non-fouling.
- C. Flag: Provided and installed by Owner.
- D. Rope: Provided and installed by Contractor.
- E. Cleats: 9 inch size, aluminum with galvanized steel fastenings, two per halyard.
- F. Halyard: 5/16 inch diameter polypropylene, braided, white.

SECTION 10350

FLAGPOLES

2.5 MOUNTING COMPONENTS

- A. Foundation:
 - 1. Refer to drawings and Section 03300 for concrete foundation.
 - 2. Provide anchor bolts as recommended and designed by manufacturer.
 - 3. Foundation should be flush with surrounding grade/concrete walkway.
- B. Pole Base Attachment: Flush; steel base with base cover.

2.6 FINISHING

- A. Aluminum: Clear Anodized Finish
- B. Finial: Clear Anodized Finish

PART 3 – EXECUTION

3.1 EXAMINATION

- A. Verify that concrete foundation is ready to receive work and dimensions are as indicated on shop drawings.

3.2 PREPARATION

- A. Coat metal below grade and surfaces in contact with dissimilar materials with asphaltic paint.

3.3 INSTALLATION

- A. Install flagpole, base assembly, and fittings in accordance with manufacturer's instructions.
- B. Install foundation plate and centering wedges for flagpoles base set in concrete base and fasten.

3.4 ERECTION TOLERANCES

- A. Maximum Variation From Plumb: 1 inch.

3.5 ADJUSTING

- A. Adjust operating devices so that halyard and flag function smoothly.

END OF SECTION

SECTION 10430

BUILDING SIGNAGE – DIMENSIONAL LETTERS

PART 1 – GENERAL

1.1 SECTION INCLUDES:

- A. Dimensional Letters of light weight fabricated metal construction.

1.2 RELATED SECTIONS:

- A. Section 04810 – Unit Masonry Assemblies
- B. Section 05500 – Metal Fabrications

1.3 SUBMITTALS

- A. See Section 01300 - Administrative Requirements, for submittal procedures.
- B. Product Data: Submit product data for specified products. Include material details for each sign specified.
- C. Shop Drawings: Submit shop drawings showing layout, profiles, and product components, including dimensions, anchorage, and accessories.
- D. Samples: Submit supplier's standard color chart for selection purposes and selected colors for verification purposes.
- E. Installation: Submit supplier's installation instructions.
- F. Closeout Submittals:
 - 1. Submit operation and maintenance data for installed products, including precautions against harmful cleaning materials and methods.
 - 2. Submit warranty documents specified herein.

1.4 DELIVERY, STORAGE AND HANDLING

- A. Comply with requirements of Division 01.
 - 1. Comply with manufacturer's ordering instructions and lead time requirements to avoid construction delays.
 - 2. Deliver products in manufacturer's original, unopened, undamaged containers with identification labels intact.
 - 3. Store products protected from weather, temperature, and other harmful conditions as recommended by supplier.
 - 4. Handle products in accordance with manufacturer's instructions.

1.5 WARRANTY

- A. Project Warranty: Comply with requirements of Division 01.
- B. Manufacturer's Warranty: Submit manufacturer's standard warranty document executed by authorized company official.
 - 1. Warranty Period: One (1) year from product ship date. Warranty specifically excludes letter mounting substrate.

PART 2 – PRODUCTS

2.1 MANUFACTURERS

- A. Basis of Design: ASI, 3860 W. Northwest Highway, Suite 350, Dallas, TX 75220; (214) 352-9140 telephone; (214) 352-9741 facsimile; (800) ASI-SPEC [274-7732]
- B. Or one of the following:
 - 1. ACE Sign Systems, Inc.
 - 2. Advance Corporation; Braille-Tac Division.
 - 3. Allen Industries Architectural Signage
 - 4. Allenite Signs; Allen Marking Products, Inc.
 - 5. APCO Graphics, Inc.
 - 6. Best Sign Systems Inc.
 - 7. Bunting Graphics, Inc.
 - 8. Fossil Industries, Inc.

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BUILDING SIGNAGE – DIMENSIONAL LETTERS

9. Gemini Incorporated.
 10. Grimco, Inc.
 11. Innerface Sign Systems, Inc.
 12. InPro Corporation
 13. Matthews International Corporation; Bronze Division.
 14. Mills Manufacturing Company.
 15. Mohawk Sign Systems.
 16. Nelson-Harkins Industries.
 17. Seton Identification Products.
 18. Signature Signs, Incorporated.
 19. Supersine Company (The)
- C. Substitutions: Refer to Section 01600 for product requirements.

2.2 DIMENSIONAL LETTERS

- A. Basis of Design: Series LF, Light Weight Fabricated Metal Dimensional Letters.
- B. Letter Material:
 1. Aluminum in baked enamel finish, Architect to select color from Manufacturer's Full Range
- C. Fabricated Letters:
 1. Height: As indicated on Drawings.
 2. Depth:
 - a. 1/2"
 3. Letter Style: To match to Owner's standard font type.
 4. Mounting Method:
 - a. Letters to protrude from surface 1" with stud-mounting in adhesive grouts.

2.3 FABRICATION – GENERAL

- A. General: Comply with requirements indicated for materials, thicknesses, finishes, colors, designs, shapes, sizes, and details of construction.
- B. Design, fabricate, and install sign assemblies to prevent buckling, opening up of joints, and over-stressing of welds and fasteners.
- C. Mill joints to a tight, hairline fit. Form joints exposed to the weather to exclude water penetration.
- D. Conceal fasteners if possible; otherwise, locate fasteners where they will be inconspicuous.
- E. Create signage to required sizes and layout. Comply with requirements indicated for design, dimensions, finish, color, and details of construction.

PART 3 – EXECUTION

3.1 EXAMINATION

- A. Verify existing conditions before starting work.
- B. Verify substrate is ready to receive work.

3.2 INSTALLATION

- A. Install in accordance with manufacturer's instructions.
- B. Secure rigidly in place.
- C. Mount with concealed fasteners held in wall with an appropriate cement/epoxy.

3.3 CLEANING, PROTECTION AND REPAIR

- A. Repair scratches and other damage which might have occurred during installation. Replace components where repairs were made but are still visible to the unaided eye from a distance
- B. Remove temporary coverings and protection to adjacent work areas. Clean installed products in accordance with manufacturer's instructions prior to Owner's acceptance. Remove construction debris from project in accordance with provisions in Division 01.

END OF SECTION

SECTION 10440
BUILDING SIGNAGE

PART 1 – GENERAL

1.1 SECTION INCLUDES

- A. Acrylic Plaque

1.2 RELATED SECTIONS

- A. Section 04810 – Unit Masonry Assemblies
- B. Section 06100 – Rough Carpentry: Wood blocking and shims.

1.3 SUBMITTALS

- A. See Section 01300 - Administrative Requirements, for submittal procedures.
- B. Shop Drawings: Indicate plaque style, lettering font, foreground and background colors, location and overall dimensions.
- C. Manufacturer's Installation Instructions: Include installation template and attachment devices.
- D. Product Data: Provide product data and style options.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. A.R.K Ramos Architectural Signage Systems, Oklahoma City, OK 73109
- B. Architectural Compliance Sign Co., Skokie, IL 60076
- C. Art in Bronze, Kingwood, WV 26537
- D. Nelson Harkins Industries, Inc., Chicago, IL.
- E. OMC Industries, Inc., Bryan, TX 77805
- F. The Southwell Co., San Antonio, TX 78291
- G. Substitutions: See Section 01600 - Product Requirements.

2.2 COMMEMORATIVE PLAQUE

- A. ¼" Acrylic Plastic with 1" standoffs
- B. Sign shall minimally include:
 - 1. Name of Project
 - 2. Name of Owner
 - 3. Name of Board Members and Administration listed on drawing title sheet.
 - 4. Name and City of Architect
 - 5. Name and City of General Contractor
 - 6. Owner's Logo
 - 7. Date of Project
- C. Size: 30" x 24"
- D. Border: Double line
- E. Color: to be selected from manufacturer's standard line of colors for acrylic and lettering
- F. Design services by Contractor, final approval by Architect.

PART 3 – EXECUTION

3.1 EXAMINATION

- A. Verify existing conditions before starting work.
- B. Verify substrate is ready to receive work.

3.2 INSTALLATION

- A. **Final installed location to be determined by owner and architect.**
- B. Install in accordance with manufacturer's instructions.
- C. Secure rigidly in place.
- D. Mount with concealed fasteners held in wall with an appropriate cement/epoxy.

END OF SECTION

SECTION 10441

PLASTIC SIGNS

PART 1 – GENERAL

1.1 SECTION INCLUDES

- A. Raised letter plastic signs.

1.2 REFERENCES

- A. ANSI/ICC A117.1 - American National Standard for Accessible and Usable Buildings and Facilities; International Code Council; 1998.

1.3 SUBMITTALS

- A. See Section 01300 - Administrative Requirements, for submittal procedures.
- B. Shop Drawings: Indicate sign styles, lettering font, foreground and background colors, locations, overall dimensions of each sign.
- C. Samples: Submit two sample signs, full size illustrating type, style, letter font, and colors specified; method of attachment.
- D. Manufacturer's Installation Instructions: Include installation template and attachment devices.

1.4 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum five years of documented experience.

1.5 REGULATORY REQUIREMENTS

- A. Conform to applicable code and ANSI/CABO A117.1 for requirements for the physically handicapped.

1.6 DELIVERY, STORAGE, AND PROTECTION

- A. Package signs, labeled in name groups.
- B. Store adhesive attachment tape at ambient room temperatures.

1.7 ENVIRONMENTAL REQUIREMENTS

- A. Do not install signs when ambient temperature is lower than recommended by manufacturer.
- B. Maintain this minimum temperature during and after installation of signs.

PART 2 – PRODUCTS

2.1 MANUFACTURERS

- A. Plastic Signs:
 - 1. Best Sign Systems; www.bestsigns.com
 - 2. Mohawk Sign Systems, Inc.; www.mohawksign.com
 - 3. ASI Sign Systems; www.asisignage.com
 - 4. 290 Sign Systems; www.290signs.com
 - 5. The Alphabet Shop; www.alphabetshop.com
 - 6. Takeform Architectural Graphics; www.takeform.net
 - 7. Substitutions: See Section 01600 - Product Requirements

2.2 RAISED LETTER SIGNS

- A. Base Material: Acrylic plastic:
 - 1. Total Thickness: 1/8 inch
 - 2. Height: Per Drawings
 - 3. Edges and Frames: Per drawings
- B. Raised Character Size and Style: Acrylic plastic, character adhered to base material:
 - 1. Comply with applicable provisions of ANSI/ICC A117.1, including Braille
 - 2. Character Color: Black
 - 3. Character Thickness: 1/8 inch

SECTION 10441

PLASTIC SIGNS

4. Height: 1 inch
5. Edges: Square
6. Character Font: Helvetica
7. Character Case: Upper case only

2.3 INDIVIDUAL GRAPHICS

- A. Comply with applicable provisions of ANSI/ICC A117.1 for signs not required to be tactile.
- B. Material: Acrylic plastic:
 1. Thickness: 1/8 inch
 2. Height: 2 inches
 3. Edges: Square
- C. Character Style:
 1. Character Color: Black
 2. Character Font: Helvetica
 3. Character Case: Upper case only
- D. Graphic Style: Handicapped type

2.4 ACCESSORIES

- A. Mounting Hardware: Chrome screws (double sided tape is not allowed)

PART 3 – EXECUTION

3.1 EXAMINATION

- A. Verify that substrate surfaces are ready to receive work.

3.2 INSTALLATION

- A. Install in accordance with manufacturer's instructions - **no double sided tape allowed.**
- B. Install signs in locations indicated.

3.3 SCHEDULES – REFER TO DRAWINGS

END OF SECTION

SECTION 10523

FIRE EXTINGUISHER CABINETS AND ACCESSORIES

PART 1 – GENERAL

1.1 SECTION INCLUDES

- A. Fire extinguisher cabinets.
- B. Accessories.

1.2 RELATED SECTIONS

- A. Section 04810 – Unit Masonry Assemblies
- B. Section 06114 – Wood Blocking and Curbing: Wood blocking and shims.

1.3 REFERENCES

- A. NFPA 10 - Standard for Portable Fire Extinguishers; National Fire Protection Association; 2002.
- B. UL (FPED) - Fire Protection Equipment Directory; Underwriters Laboratories Inc.; current edition.

1.4 PERFORMANCE REQUIREMENTS

- A. Comply with NFPA 10.
- B. Provide extinguishers classified and labeled by Underwriters Laboratories Inc. for the purpose specified and indicated.

1.5 SUBMITTALS

- A. See Section 01300 - Administrative Requirements, for submittal procedures.
- B. Shop Drawings: Indicate cabinet physical dimensions, rough-in measurements for recessed cabinets, wall bracket mounted measurements and location.
- C. Product Data: Provide cabinet and bracket product data.
- D. Manufacturer's Installation Instructions: Indicate special criteria and wall opening coordination requirements.
- E. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.

PART 2 – PRODUCTS

2.1 MANUFACTURERS

- A. Fire Extinguishers, Cabinets and Accessories:
 - 1. Basis of Design: Larsen's Manufacturing Co., Lombard, IL 60148.
 - 2. Substitutions: See Section 01600 - Product Requirements.

2.2 FIRE EXTINGUISHERS – PROVIDED AND INSTALLED BY OWNER

2.3 FIRE EXTINGUISHER CABINETS

- A. Architectural; Series: Product 2712-RL (SS) at 8" wall and Product 2712-R (SS) at walls greater than 8". **Entire Fire Extinguisher Cabinet and Door to be Stainless Steel.**
- B. Metal: Formed stainless steel sheet; 0.036 inch thick base metal.
- C. Cabinet Configuration: Recessed type.
 - 1. Sized to accommodate accessories.
 - 2. Trim: Returned to wall surface, with 5/8" projection, 1 ¼" wide face.
 - 3. Form cabinet enclosure with right angle inside corners and seams. Form perimeter trims and door styles.
- D. Door: 0.036 inch thick, reinforced for flatness and rigidity; latch. Hinge doors for 180 degree opening with continuous piano hinge. Provide nylon roller type catch. Vertical Duo Glass.
- E. Door Glazing: Acrylic. Set in resilient channel gasket glazing. At Gym, provide solid door with vertical letters.
- F. Cabinet Mounting Hardware: Appropriate to the cabinet. Pre-drill for anchors.
- G. Weld, fill and grind components smooth.
- H. Finish of cabinet exterior trim and door: **Stainless Steel**
- I. Finish of cabinet interior: **Stainless Steel**

SECTION 10523

FIRE EXTINGUISHER CABINETS AND ACCESSORIES

2.4 ACCESSORIES

- A. Cabinet Signage: "Fire Extinguisher" identified on cabinet in red letters vertically along hinge side of door. Do not place letters on the acrylic.

PART 3 – EXECUTION

3.1 EXAMINATION

- A. Verify existing conditions before starting work.
- B. Verify rough openings for cabinet are correctly sized and located.

3.2 INSTALLATION

- A. Install in accordance with manufacturer's instructions.
- B. Secure rigidly in place.
- C. Place extinguishers and accessories in cabinets.

3.3 SCHEDULE

- A. All fire extinguishers and brackets to be provided and installed by Owner, except any brackets inside cabinets - to be provided by Contractor.
- B. All cabinets and signage and other related accessories to be provided and installed by Contractor.

END OF SECTION

SECTION 10524

DATA AND KEY STORAGE CABINETS

PART 1 – GENERAL

1.1 SECTION INCLUDES

- A. Data and key storage cabinet for fire/police rapid entry.
- B. Accessories for installation.
- C. Coordination requirements.

1.2 RELATED SECTIONS

- A. Section 04810 - Unit Masonry Assemblies

1.3 REFERENCES

- A. Underwriter's Laboratories Listing

1.4 PERFORMANCE REQUIREMENTS

- A. Conform to local Fire and Police Departments Standards and keying requirements unless exceeded herein.

1.5 SUBMITTALS

- A. See Section 01300 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide Manufacturer's Complete product data and installation requirements for model(s) selected to be installed including all accessories.
- C. Shop Drawings: Indicate location of unit, dimensions, clearances, depth of recess, mounting and reinforcing details. Indicate methods of installation differing from manufacturer's standard details. Indicate keying requirements as per the Local Fire and Police Departments standards and certify that keying has been approved.
- D. Samples: Submit color charts from manufacturer's full range for selection by the Architect.
- E. Test Reports: Indicate UL compliance on all items to be installed with the work of this section.
- F. Local Jurisdiction Requirements: Submit two copies of requirements from local Fire and Police Departments for items connected with the work of this section.
- G. Certificates: Certify that products of this section meet or exceed the requirements of the local Fire and Police Departments standards, and that this product has been approved for installation and use by the Local Fire and Police Departments.
- H. Manufacturer's Instructions: Provide Manufacturer's instructions for unit installation and use.
- I. Operation Data: Provide operation data on all items connected with the work of this section.
- J. Maintenance Data: Provide Manufacturer's recommended maintenance schedule to maintain operations of the unit. Provide additional requirements for inspection of unit(s) by the local Fire and Police Departments.
- K. Warranty: Submit manufacturer warranty and ensure that forms have been completed in Owner's name and registered with manufacturer.

1.6 QUALITY ASSURANCE

- A. **Perform all work in accordance with conformance with requirements of local Fire and Police Departments.**
 - 1. Keep a copy of the requirements on site for review and reference.
- B. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section, with not less than 5 years of documented experience.
- C. Installer Qualifications: Company specializing in performing the work of this section with minimum 5 years of documented experience.

1.7 PRE-INSTALLATION MEETING

- A. Convene one week before starting work of this section. Meeting may be held concurrently with the work of Section 04810 - Unit Masonry Assemblies with attendees listed therein. Contractor must impart coordination information discussed to fire and or security alarm installer.

SECTION 10524

DATA AND KEY STORAGE CABINETS

1.8 DELIVERY, STORAGE, AND PROTECTION

- A. Deliver all materials and accessories to project site in good condition and acceptable finish without defects.
- B. Store all materials under controlled environment prior to installation. Do not allow materials to become wet or damaged.

1.9 PROJECT CONDITIONS

- A. Coordinate the work of this section with that of Section 04810 - Unit Masonry Assemblies. Provide full flashing protection for all recessed units installed into masonry.
- B. Coordinate installation with all mechanical and electrical items; notify Architect immediately of any conflict.

1.10 WARRANTY

- A. See Section 01780 - Closeout Submittals, for additional warranty requirements.
- B. Correct defective Work within a one year period after Date of Substantial Completion.

PART 2 – PRODUCTS

2.1 MANUFACTURERS

- A. Knox Company, 17672 Armstrong Avenue, Irvine, Ca. 92614 (800) 552-5669
www.knoxbox.com
- B. Substitutions: See Section 01600 - Product Requirements.

2.2 MATERIALS

- A. Procure all materials and accessories from single manufacturer.
- B. Provide Knox Company "Knox Vault" 4400 series recessed mount and locations as shown on drawings.
 - 1. Provide 4 access keys to owner prior to substantial completion.

2.3 COLORS

- A. As selected by Architect from Manufacturer's full range.

2.4 ACCESSORIES

- A. Provide recessed mounting kit with tie-in rebar for all recessed units.
- B. Provide recessed mounting flange, bolts and all other items required for a complete installation.
- C. Provide tamper switch, wire lead and all other accessories required for interface with fire and or security alarm system(s).

PART 3 – EXECUTION

3.1 EXAMINATION

- A. Verify that all materials are as specified, are free from defects and damage, and that construction is ready to receive new units

3.2 PREPARATION

- A. Coordinate work with masonry contractor for installation of recessed mounting kit, reinforcing, unit and all related accessories.

3.3 INSTALLATION

- A. Install unit and all accessories in accordance with Manufacturer's recommended installation unless exceeded herein.

SECTION 10524

DATA AND KEY STORAGE CABINETS

3.4 INSTALLATION TOLERANCES

- A. Maximum deviation from level: 1/8 inch in 4 feet.
- B. Maximum deviation from level plane at face frame: 1/16 inch

3.5 FIELD QUALITY CONTROL

- A. Perform field inspection and review of installed units with necessary Fire and Police Department personnel. Notify architect in writing of inspection results.
- B. Install all recessed mounting kits with full flashing protection, and in accordance with all grouting and reinforcement requirements set forth in Section 04810 - Unit Masonry Assemblies.

3.6 COORDINATION WITH OTHER SYSTEMS

- A. Coordinate installation of unit and all accessories with requirements of fire and or security systems. Mount and adjust tamper switch as required to interface with fire and or security system, and to achieve operable status.
- B. Test operable condition of tamper switch and other accessories with other trades as required.

3.7 ADJUSTING

- A. Adjust all hinges, locks, mounting hardware and other devices for smooth operation.

3.8 CLEANING

- A. Thoroughly clean all surfaces both interior and exterior to unit with cleaning agent recommended by manufacturer.
- B. Maintain all lock cylinders and other operable parts in lubricated condition and free from dirt, debris or other contaminates.

3.9 PROTECTION

- A. Provide sufficient coverage protection from masonry and or mortar debris or other construction activities and materials until project completion.

END OF SECTION

SECTION 10800

TOILET ACCESSORIES

PART 1 – GENERAL

1.1 SECTION INCLUDES

- A. Accessories for toilet rooms.
- B. Grab bars.

1.2 RELATED SECTIONS

- A. Section 04810 – Unit Masonry Assemblies.
- B. Section 10211 - Toilet Compartments.

1.3 REFERENCES

- A. ASTM A 666 - Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar; 2000.
- B. ASTM C 1036 - Standard Specification for Flat Glass; 2001.
- C. GSA CID A-A-3002 - Mirrors, Glass; U.S. General Services Administration; 1996.

1.4 SUBMITTALS

- A. See Section 01300 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide data on accessories describing size, finish, details of function, attachment methods.

1.5 COORDINATION

- A. Coordinate the work with the placement of internal wall reinforcement, concealed ceiling supports, and reinforcement of toilet partitions to receive anchor attachments.

PART 2 – PRODUCTS

2.1 MANUFACTURERS

- A. Toilet Accessories:
 - 1. A and J Washroom Accessories, New Windsor, NY 12553
 - 2. American Dryer, Livonia, MI. 48150.
 - 3. American Specialties, Inc., Yonkers, NY 10701
 - 4. Bradley Corp., Menominee Falls, WI 53052
 - 5. Substitutions: Section 01600 - Product Requirements.
- B. All items of each type to be made by the same manufacturer.

2.2 MATERIALS

- A. Accessories - General: Shop assembled, free of dents and scratches and packaged complete with anchors and fittings, steel anchor plates, adapters, and anchor components for installation.
 - 1. Grind welded joints smooth.
 - 2. Fabricate units made of metal sheet of seamless sheets, with flat surfaces.
- B. Keys: Provide 3 keys for each accessory to Owner; master key all lockable accessories.
- C. Stainless Steel Sheet: ASTM A 666, Type 304.
- D. Mirror Glass: Float glass, ASTM C 1036 Type I, Class 1, Quality Q2, with silvering, copper coating, and suitable protective organic coating to copper backing in accordance with GSA CID A-A-3002.
- E. Fasteners, Screws and Bolts: Hot dipped galvanized, tamper-proof, security type.

2.3 FINISHES

- A. Stainless Steel: No. 4 satin brushed finish, unless otherwise noted.

SECTION 10800

TOILET ACCESSORIES

2.4 TOILET ROOM ACCESSORIES

- A. Mirrors (provided and installed by Contractor): Stainless steel framed, 6 mm thick float glass mirror.
 - 1. Size: As indicated on Drawings
 - 2. Frame: 0.5 inch angle shapes, with mitered and welded and ground corners, and tamper-proof hanging system; No. 4 finish.
 - 3. Backing: Full-mirrored sized, minimum 0.03 inch galvanized steel sheet and non-absorptive filler material.
 - 4. Product:
 - a. Mirror: 0600 manufactured by American Specialties
- B. Grab Bars (provided and installed by Contractor): Stainless steel, 1-1/2 inches outside diameter, minimum 0.05 inch wall thickness, non-slip grasping surface finish, concealed flange mounting; 1-1/2 inches clearance between wall and inside of grab bar.
 - 1. Length and Configuration: As indicated on Drawings
 - 2. Product: Open
- C. Toilet Tissue Dispensers (provided by owner and installed by Contractor).
- D. Paper Towel Dispenser (provided by owner and installed by Contractor).
- E. Liquid Soap Dispenser (provided by owner and installed by Contractor).

PART 3 – EXECUTION

3.1 EXAMINATION

- A. Verify existing conditions before starting work.
- B. Verify exact location of accessories for installation.
- C. Verify that field measurements are as indicated on drawings.

3.2 PREPARATION

- A. Deliver inserts and rough-in frames to site for timely installation.
- B. Provide templates and rough-in measurements as required.

3.3 INSTALLATION

- A. Install accessories in accordance with manufacturers' instructions.
- B. Install plumb and level, securely and rigidly anchored to substrate.
- C. Mounting Heights and Locations: As required by accessibility regulations, as indicated on drawings.

END OF SECTION

SECTION 11490

ATHLETIC EQUIPMENT

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the contract, including General and Supplementary conditions and division1 specification sections, apply to this section.

1.2 SUMMARY

- A. This section includes the following gymnasium equipment:
 - 1. Basketball Equipment
 - 2. Volleyball Equipment

1.3 DEFINITIONS

- A. FIBA: International Basketball Federation (Federation Internationale de Basketball Amateur)
- B. FIVB: International Volleyball Federation (Federation Internationale de Volleyball)
- C. NAGWS: National Association for Girls and Women in Sport
- D. NCAA: National Collegiate Athletic Association
- E. NFHS: National Federation of State High School Associations
- F. USAV: United States of America Volleyball (formerly, USVBA: U.S. Volleyball Association)

1.4 PERFORMANCE REQUIREMENTS

- A. Seismic Performance: Provide basketball backstops capable of withstanding the effects of earthquake motions determined according to the building code in effect for this project or ASCE 7, "Minimum Design Loads for Buildings and Other Structures": Section 9, "Earthquake Loads," whichever is more stringent.

1.5 SUBMITTALS

- A. Product data: For each type of product indicated. Include construction details, material descriptions, dimensions of individual components and profiles, features, and finishes. Include details of anchors, hardware, and fastenings. If applicable, include assembly, disassembly, and storage instructions.
 - 1. Gymnasium Equipment Operators: Include operating instructions
- B. Shop Drawings: Show location and extent of fully assembled gymnasium equipment. Show location and extent of disassembled equipment and components and transport and storage accessories. Include elevations, sections, and details not shown in product data. Show method of field assembly, connections, installation details, mountings, floor inserts, attachments to other work, operational clearances, and relationship to adjoining work.
 - 1. Blocking and reinforcement: Show locations of blocking and reinforcement required for support of gymnasium equipment.
- C. Coordination Drawings: Court layout plans and elevations drawn to scale and coordinating floor-insert penetrations and game lines and markers applied to finish floor.
- D. Samples for initial selection: For each type of gymnasium equipment indicated where feasible.
- E. Samples for verification: For the following products
 - 1. Pad fabric: complete line of manufacturers colors with material specifications included.
- F. Product certificates: For each type of gymnasium equipment, signed by product manufacturer.
- G. Manufacturers certificates: Signed by manufacturers certifying that they comply with requirements. Include evidence of manufacturing experience.
- H. Qualification data: For professional engineer
- I. Maintenance Data: For gymnasium equipment and gymnasium equipment operator to include in maintenance manuals.

1.6 QUALITY ASSURANCE

- A. Installer Qualifications: A qualified installer
- B. Source limitations: Obtain each type of gymnasium equipment through one source from a single manufacturer.
- C. Standards: Provide gymnasium equipment complying with or exceeding the requirements of the State High School Association

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1.7 PROJECT CONDITIONS

- A. Environmental limitations: Do not install gymnasium equipment until spaces are enclosed and weatherproof, wet work in spaces is complete and dry, and ambient temperature and humidity conditions are maintained at the levels indicated for project when occupied for its intended use.
- B. Field measurements: Verify position and elevation of floor inserts and layout for gymnasium equipment. Verify dimensions by field measurements.

1.8 COORDINATION

- A. Coordinate installation of floor inserts with structural floors and finish flooring installation and with court layout and markers on finished floor.
- B. Coordinate layout and installation of overhead-supported gymnasium equipment and suspension system components with other construction that penetrates ceilings or is supported by them, including light fixtures, HVAC equipment, fire-suppression-system components, and partition assemblies.

PART 2 – PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. Aalco or pre-approved Manufacturer

2.2 MATERIALS, GENERAL

- A. Aluminum: Alloy and temper recommended by aluminum producer and finisher for type of use and finish indicated; mill finish or decorative, baked-enamel, powder-coat finish.
 - 1. Extruded Bars, Profiles, and Tubes: ASTM B 221
 - 2. Cast Aluminum: ASTM B 179
- B. Steel: Comply with the following
 - 1. Steel plates, shapes, and bars: ASTM A 36/A 36M, hot dipped galvanized
 - 2. Steel pipe: Standard-weight steel pipe complying with ASTM A 53.
 - 3. Cold formed Steel tubing: ASTM A 500, Grade A, unless another grade is required by structural loads.
 - 4. Steel mechanical tubing: Cold-rolled, electric-resistance-welded carbon or alloy steel tubing complying with ASTM A 513 or steel tubing fabricated from steel complying with ASTM A 569/A 569 M and complying with the dimensional tolerances in ASTM A 500.
 - 5. Malleable-iron castings: ASTM A 47, Grade required by structural loads.
 - 6. Support cable: ¼ inch- (6mm) diameter, 7x19 galvanized steel aircraft cable with a manufacturer's written recommendation for size, number, and method of installation.
 - 7. Support chain: Proof coil chain, complying with ASTM A 413/A 413M, grade 30, size and diameter as required by structural loads; plated or painted. Provide fittings complying with chain manufacturer's written recommendations for size, number, and method of installation.
- C. Particleboard: ANSI A208.1.
- D. Wood-based, Structural-use panels: Comply with DOC PS 2; for plywood, comply with DOC PS 1.
- E. Equipment mounting pads: Wood, transparent or neutral color painted finish, size, and quantity as required to mount gymnasium equipment according to manufacturer's written recommendations
- F. Anchors, fasteners, fittings, and hardware: Manufacturer's standard corrosion resistant or non-corrodible units. Provide as required for gymnasium equipment assembly, mounting, and secure attachment.
- G. Non-shrink, non-metallic grout: Premixed, factory-packaged, non-staining, non-corrosive, non-gaseous grout complying with ASTM C 1107 with minimum strength recommended in writing by gymnasium equipment manufacturer.

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ATHLETIC EQUIPMENT

2.3 BASKETBALL EQUIPMENT

- A. Specifications herewith are based upon products produced by Aalco Manufacturing Company, St. Louis, MO 63125.
1. Provide Aalco Mfg. Co. model #136FJK (Forward-Fold).
 - a. Backboard supporting main drop shall be in the form of a braced "T" of welded construction where size will permit it to be so shipped. Braces shall be of at least 2 3/8" O.D. pipe and stem shall be 6 5/8" O.D. 11 ga steel tube. Bracing shall extend to within 24" of the top of the backboard to assure adequate torsional support of the backboard. Backboard shall be extended at least 6" out from the drop by rigid support brackets. An adequate sized brace (at least 2 3/8" O.D.-9 ga) inclined approx. 30 deg. from the vertical stem, shall support the stem to the side of the backboard and jackknife to permit raising of the structure to a horizontal storage position. A stop collar shall terminate lowering of backstop at play position, and wedge-lock engages the I.D. of the outside brace tube until withdrawn by operation of the winch.
 - b. Backboards shall be Aalco Mfg. Co. model #501S. Backboards shall be of official 72" x 42" size and incorporate 1/2" tempered plate glass with fired in white target and border framed in 6063-T6 extruded aluminum equipped with key-slotted steel corner brackets. Goal shall mount directly to a steel box-beam running the entire lower edge of the board. Rubber gasketing shall separate all glass and metal parts. Backboard shall be provided guaranteed for life against breakage of the glass.
 - c. Goal shall be Aalco Mfg. Co. model #28HS4. Goal shall be of 5/8" round cold rolled material formed to an exact 18" inside diameter. Goal shall provide a safe-release mechanism designed to flex downward when pre-set pressure is applied to the rim without sustaining a permanent bend. Goal shall be provided with a 12-loop nylon net and finished in electrostatic powder coated orange.
 - d. Folding operation of the backstops shall be provided by electric winch model #75RC. Operator shall include the following features: 1) 120 VAC, capacitor-start, overload-protected motor of such HP as to raise the backstop in 2 minutes or less; 2) worm-gear speed reduction for unassisted support of load at all times, including the event of a power failure; 3) lubed-for-life bearings and gearing; 4) hoist-mounted, pre-wired rotary travel control mechanism, easily set to automatically limit both up & down travel; 5) reversing magnetic contactor enabling 4-wire remote control of hoist; and 6) up-off-down, momentary-contact, flush mounting control switch to be mounted in a remote location, touch screen to prevent unauthorized operation. Electrical conduit, wiring, etc. from the operator to power and to the remote wall switch shall be by others (electrical contractor).
 - e. Safety strap shall be Aalco Mfg. Co. model #AST. Shall be a completely automatic, non-electric mechanism capable of catching and holding a basketball backstop at any time or folding position should it fall due to failure of the hoist system. The catch shall mount to an independent portion of the overhead superstructure and to the folding structure of the backstop by means of tether which winds / rewinds from a spring powered storage reel. The tether shall be a 2" wide 6000lb. tensile strength, nylon webbing to provide both high strength and maximum shock cushioning. Rewind power shall be provided by a "spring motor" designed spring in order to provide a uniform 8 lbs of torque essential to avoiding slack. "Spirator" and other spring designs whose force diminishes 50% over its cycle will not be acceptable. A flyweight mechanism of the catch shall provide response to high speed unwinding of the tether strap by tripping the engagement of a ratchet catch, so as to stop the load within 12" of travel. Unit shall automatically reset when load is disengaged.
 - f. Backboard shall be provided with Aalco Mfg. Co. model #PGPP bolt-on type safety padding and shall be of color as chosen by the architect from manufacturer's standard color selection sheet.

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2. Provide Aalco Mfg. Co. model #2000SW-VEE (Stationary Wall-Mounted VEE) basketball backstops.
 - a. Backboard shall be fixed to a 6 5/8" O.D. main tube. This tube shall then attach to a VEE design incorporating 2" schedule 40 pipe assembled to bolt to the wall behind using vertical 2"x8" yellow pine wall stringer boards fixed to wall by using a minimum of four (4) epoxy type 1/2" rod anchors per board.
 - b. Height adjustment feature shall be Aalco Mfg. Co. model #2000 So-Lo glide. Unit shall be of electric operation and shall allow adjustment of the goal height from 8' to 10' above playing surface. Unit shall be of internal telescoping type allowing the force of play to be diverted to the mast and superstructure assembly and not to the feature itself. Shall include an electrical wand to raise and lower backstop. Bolt-on type height adjusters shall not be considered equal.
 - c. Backboards shall be Aalco Mfg. Co. model #601 of official fan-shaped size and shall be manufactured from a resin transfer mold system, over a 1 1/8" solid wood core, allowing the resins to be injected under pressure so that the board is of one piece with no seams. Border and target shall be in-laid during the molding process. Color of border and target shall be selected by the architect from manufacturer's full range of colors. Backboard shall be compatible with any goal.
 - d. Goals shall be Aalco Mfg. Co. model #27H Goals shall be of 5/8" round cold rolled material formed to an exact 18" inside diameter. Goal shall be rigidly braced by a 9/16" diameter cold drawn steel alloy rod, welded to the bottom of the rim and back plate. Finish shall be a durable electrostatic powder coating in official orange finish. Goal to be furnished with white nylon net and all hardware necessary for installation.
- B. Backboards shall be provided with Aalco Mfg. Co. model #PGPP bolt-on type safety padding and shall be of color as chosen by the architect from manufacturer's standard color selection sheet.

2.4 VOLLEYBALL STANDARDS NETS AND ACCESSORIES

- A. Specifications herewith are based upon products produced by Aalco Manufacturing Company, St. Louis, MO 63125.
 1. Provide Aalco Mfg. Co. model #APPS, Power Post Gold complete system.
 - a. Volleyball post shall be Aalco Mfg. Co. model #APPS aluminum volleyball post. Post shall be pin adjustable for net heights from 7' 11 5/8" down to 6'. Post shall be manufactured of heat-treated, high strength aluminum 6063-T6. Outer post shall be of 3 1/2" O.D. and be of special weighted extrusion to provide minimum deflection when tightening net. Inner telescoping tube shall also be of special extrusion designed to fit into outer post. Outer post shall be equipped with a rubber boot attached to the bottom of the post to prevent damage to floor during installation or removal. Tensioning device shall be of a steel worm, bronze geared winch complete with 2" wide nylon webbing. Winch shall tighten upper cable to required tension and be capable of holding at any tension without the use of a locking device. Tension shall be released by means of simply reversing the winch handle. Bottom rope cable shall be tightened by means of self-locking cam buckle straps. Post shall be finished in powder coated, brilliant gold.
 - b. Volleyball net shall be Aalco Mfg. Co. model #110. Net shall meet USAV standards of 10M x 1M (32' x 39"). 4" square netting of 3mm treated twine. 2 1/2" wide, 20 oz. White vinyl perimeter double stitched to net. Shall have 3/16" cable at top and 1/4" rope at bottom and be equipped with steel dowels in the side pockets for tensioning.
 - c. Post shall be provided with Aalco Mfg. Co. model #PPEP post pads. Pads shall be 6' high, wrap around design constructed of 1" cross-link, polyethylene foam covered with 13 o.z. reinforced vinyl of color chosen by the architect from manufacturer's full range of colors. Pads shall attach by means of Velcro.
 - d. Net shall be provided with Aalco Mfg. Co. model #PVM boundary markers. Markers shall be constructed of 2" wide vinyl with made in pocket and shall Velcro to the net.
 - e. Net shall be provided with Aalco Mfg. Co. model #PVA antennas. Antennas shall be of 2-piece fiberglass construction made to set into markers.

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- f. Sleeves shall be Aalco Mfg. Co. model #GS-35, 3 ½" I.D. sleeve as to allow for use of 3 ½" diameter volleyball post. Sleeve shall be provided with a 7" diameter brass flip-up type cover of brushed finish that is flush with the floor and allows access to the sleeve below while concealing them while not in use.

2.5 KEYED SWITCH OPERATOR

- A. **Provide key-operated, SPDT momentary, center off control switch (RACO Masonry Box) by AALCO Manufacturing Company. Refer to electrical drawings for more information and location.**

PART 3 – EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for play court layout, alignment of mounting substrates, installation tolerances, operational clearances, [accurate locations of connections to building electrical system,] and other conditions affecting performance.
 1. Verify critical dimensions.
 2. Examine supporting structure, subgrades, subfloors and footings below finished floor.
 3. Examine wall assemblies, where reinforced to receive anchors and fasteners, to verify that locations of concealed reinforcements have been clearly marked. Locate reinforcements and mark locations.
 4. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION, GENERAL

- A. General: Comply with manufacturer's written installation instructions and competition rules indicated for each type of gymnasium equipment. Complete equipment field assembly, where required.
- B. Unless otherwise indicated, install gymnasium equipment after other finishing operations, including painting, have been completed.
- C. Permanently Placed Gymnasium Equipment and Components: Rigid, level, plumb, square, and true; anchored securely to supporting structure; positioned at locations and elevations indicated on Shop Drawings; in proper relation to adjacent construction; and aligned with court layout.
 1. Floor Insert Location: Coordinate location with application of game lines and markers and core drill floor for inserts after game lines have been applied.
 2. Floor Insert Elevation: Coordinate installed heights of floor insert with installation and field finishing of finish flooring and type of floor plate.
 3. Operating Gymnasium Equipment: Verify clearances for movable components of gymnasium equipment throughout entire range of operation and for access to operating components.
- D. Floor Insert Setting: Position sleeve in oversized, recessed voids in concrete slabs and footings. Clean voids of debris. Fill void around sleeves with grout, mixed and placed to comply with grout manufacturer's written instructions. Protect portion of sleeve above subfloor and footing from splatter. Follow manufacturer installation drawings for proper sleeve installment.
- E. Wall, Corner and Column Safety Pads: Mount with bottom edge at 4 inches (102 mm) above finished floor (or) dimensions indicated on drawings.
- F. Anchoring to In-Place Construction: Use anchors and fasteners where necessary for securing built-in and permanently placed gymnasium equipment to structural support and for properly transferring load to in-place construction.
- G. Electrical Connections: Shall be completed by a certified electrician.
- H. Removable Gymnasium Equipment and Components: Assemble in place to verify that equipment and components are complete and in proper working order. Instruct Owner's designated personnel in properly handling, assembling, adjusting, disassembling, transporting, storing, and maintaining units. Disassemble removable gymnasium equipment after assembled configuration has been approved by Architect and/or Owner.

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ATHLETIC EQUIPMENT

3.3 ADJUSTING

- A. Adjust movable components of gymnasium equipment to operate safely, smoothly, easily, and quietly, free from binding, warp, distortion, nonalignment, misplacement, disruption, or malfunction, throughout entire operational range. Lubricate hardware and moving parts.

3.4 CLEANING

- A. After completing gymnasium equipment installation, inspect components. Remove spots, dirt, and debris and touch up damaged shop-applied finishes according to manufacturer's written instructions.
- B. Replace gymnasium equipment and finishes that cannot be cleaned and repaired, in a manner approved by Architect, before time of Substantial Completion.

3.5 DEMONSTRATION

- A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain gymnasium equipment.

END OF SECTION

SECTION 11680

PLAYGROUND EQUIPMENT

PART 1 – GENERAL

1.1 SUMMARY

- A. Section includes composite structure, stand-alone play events and accessories.
- B. Basis of design is Ionix® modular play structures, free-standing play equipment and accessories as manufactured by GameTime, a PlayCore Company, P.O. Box 680121, Fort Payne, Alabama 35968-0121, Phone: 1-800-235-2440, www.GameTime.com.
- C. Basis of design is PowerScape® modular play structures, free-standing play equipment and accessories as manufactured by GameTime, a PlayCore Company, P.O. Box 680121, Fort Payne, Alabama 35968-0121, Phone: 1-800-235-2440, www.GameTime.com.
- D. Basis of design is PrimeTime® modular play structures, free-standing play equipment and accessories as manufactured by GameTime, a PlayCore Company, P.O. Box 680121, Fort Payne, Alabama 35968-0121, Phone: 1-800-235-2440, www.GameTime.com.
- E. Basis of design is Xscape® modular play structures, free-standing play equipment and accessories as manufactured by GameTime, a PlayCore Company, P.O. Box 680121, Fort Payne, Alabama 35968-0121, Phone: 1-800-235-2440, www.GameTime.com.

1.2 SUBMITTALS

- A. Product Data: Include physical characteristics such as shape, dimensions, gauge and material for each component. Provide finish information and available colors.
- B. Shop Drawings: Include plans, elevations, details, and installation instructions for each component.
- C. Warranty: Include sample of manufacturer's standard warranty.

1.3 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Equipment components shall be certified by IPEMA's third party product certification service. Equipment and structural components shall bear the IPEMA certification seal. IPEMA validation is available at www.ipema.org.
- B. Installer: Must be certified by the manufacturer.
- C. Safety Standards: Comply with requirements of ASTM F 1487.

1.4 WARRANTY

- A. Warranty shall meet or exceed the warranty provisions of GameTime as follows:
 - 1. Lifetime limited warranty on PowerScape®, PrimeTime®, Modern City®, Xscape® & IONiX® uprights.
 - 2. Lifetime limited warranty on Tru-Loc® connections and upright bolt-through connections.
 - 3. Lifetime limited warranty on all hardware.
 - 4. 20 Year limited warranty on Timber Décor™ & Timbers recycled plastic lumber.
 - 5. 15 Year limited warranty on metal decks, pipes, rungs, rails, loops, braces, and footbucks.
 - 6. 15 Year limited warranty on rotationally molded products.
 - 7. 15-Year limited warranty on VistaRope nylon bearings and ring junction pieces. 10 Year limited warranty on GTFit, THRIVE and Challenge Course posts & bars. 10 Year limited warranty on site furnishings against structural failure.
 - 8. 10-Year limited warranty on SunBlox® products.
 - 9. 10 Year limited warranty on integrated GTShade® products. 10 Year limited warranty on fiberglass and DHPL signage. 10-Year limited warranty on VistaRope WeaveTech cables.
 - 10. 5 Year limited warranty on TuffForms® structures, including TuffCrete™ and PolyShield.
 - 11. 5 Year limited warranty on nylon covered cable net climbers and components.
 - 12. 5 Year limited warranty on GT Symphony Freenotes™ Harmony Park components.
 - 13. 5 Year limited warranty on Super Seats™.
 - 14. 5-Year limited warranty on premature wear of VistaRope cables.
 - 15. 3 Year limited warranty on Everybody Plays polyurea coated foam & rubber strips.
 - 16. 3 Year limited warranty on SaddleMates® rubber and "C" springs.

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PLAYGROUND EQUIPMENT

17. 3-Year limited warranty on SureGrip Material
18. 2 Year limited warranty on Challenge Course timing components.
19. 1 Year limited warranty on all other GameTime products.

PART 2 – PRODUCTS

2.1 MATERIALS

A. Ionix

1. Main Structural Uprights
 - a. Shall be 3.5" outside diameter, 13 gauge (nominal .095") galvanized round tubing, manufactured to ASTM A-500 Grade B tolerances from cold-formed steel conforming to ASTM A-1011 Sheet Spec for steel coil. Minimum yield strength shall be 45,000 psi and minimum tensile strength shall be 48,000 psi. The exterior surface is In line Zinc Flo Coating with a zinc coating of .03 thickness minimum, chromate conversion coated, and a clear high performance organic polymer is applied. Galvanizing coverage shall demonstrate the ability to exceed 1000 hours salt spray corrosion exposure in accordance with ASTM B-117. Internal surface zinc rich 91% minimum zinc dust content in organic resin, as per ASTM F-1043. All upright posts shall be coated with a custom formula TGIC.
2. Component Attachment – Must be factory preset to the uprights to ensure full field compliance with current safety standards. Hinges, or any clamps, that require field locating or field drilling or installation are not acceptable, due to the susceptibility of installation out of compliance with safety standards.
3. Plastisol Coated Steel – Products including platforms, steps, and bridges shall be fabricated from 12-gauge perforated steel with a .08" minimum thickness, textured slip-resistant polyvinyl chloride plastisol dipped coating. Platforms must attach directly to threaded inserts factory installed to uprights, using (2) 3/8" bolts at each upright connection point to eliminate the possibility of deck slipping. Plastisol coating shall be free of latex and tested to meet California standards for phthalate levels and safe for children. Available in manufacturers standard colors.
4. Molded Polyethylene – Products are to be rotationally molded plastic with a ¼" nominal wall thickness. All plastic is to be U.V. stabilized with optional graphics molded into the component during the molding process. Molded products shall have an anti-static additive and be available in any of the manufacturer's standard colors.
5. High Density Polyethylene shall be made from either ½" or ¾" thick (depending on application used) high density, UV-stabilized and color impregnated polyethylene.
6. Metal Climbers and Enclosures – Products shall be fabricated from 1 5/16" OD x .083" (14 gauge) wall galvanized steel tubing with frames fabricated of 2 3/8" OD x .134 (10 gauge) wall galvanized steel tubing. All tubing used shall be an electrical resistance welded, cold rolled, high strength steel tubing. The exterior coating will consist of an in-line Zinc Flo Coating with a zinc coating of .03 thickness minimum, chromate conversion, and acrylic over- coating. The interior coating will consist of a special organic acrylic modified polyester. All climbers shall be coated with a custom formula TGIC.
7. Cables - shall be 18mm polyester twisted type with the following properties: calculated tensile strength of >60kN, quantity 6 strands 2.8mm diameter each, steel strands shall have QTY 19 steel wires diameter .62mm each, quantity 3 fiber core 2.7mm diameter each, UV protected polyester impregnated. Terminations shall be made of the following materials: Aluminum forks, stainless steel D-shackles, stainless steel lifting eye nuts. Connections shall be made of the following: Aluminum connector eggs, aluminum 2-piece T-joints, aluminum T-joints, aluminum in-line connector, aluminum ferrules.

SECTION 11680

PLAYGROUND EQUIPMENT

8. Hardware – All nuts, bolts, screws, inserts, and lock washers used in the assembly of all play equipment shall be stainless steel, yellow dichromate plated steel, blue-coat plated steel, mechanically galvanized or powder coated/yellow dichromate plated steel. All primary fasteners shall be 304 alloy stainless steel. Fasteners with yellow dichromate treatment have an electro-deposited, 99.9% pure zinc substrate applied from a specially formulated solution sealed with a yellow dichromate topcoat designed to work in conjunction with the zinc plating. Yellow dichromate has a 320% longer life to white corrosion and 275% longer to red corrosion than does hot-dip galvanizing.
- B. Powerscape
1. Main Structural Uprights
 - a. Shall be 5" outside diameter tubing, 1/8" wall thickness, extruded from 6005A-T61 aluminum alloy conforming to ASTM-B-221. Minimum yield strength shall be 35,000 psi and minimum tensile strength shall be 38,000 psi. All upright posts shall be coated with a custom formula TGIC polyester powder coating in conformance with the specification outlined herein.
 - (AND/OR)
 - b. Shall be 5" outside diameter, 11 gauge (nominal .120") galvanized round tubing, manufactured to ASTM A-1011 Grade B tolerances from cold-formed steel conforming to ASTM A-569 Sheet Spec for steel coil. Minimum yield strength shall be 45,000 psi and minimum tensile strength shall be 48,000 psi. The exterior surface is In line Zinc Flo Coating with a zinc coating of .03 thickness minimum, chromate conversion coated, and a clear high performance organic polymer is applied. Galvanizing coverage shall demonstrate the ability to exceed 1000 hours salt spray corrosion exposure in accordance with ASTM B-117. Internal surface zinc rich 91% minimum zinc dust content in organic resin, as per ASTM F-1043. All upright posts shall be coated with a custom formula TGIC.
2. Tru Loc Connectors – Must attach directly to factory preset threaded insert in the uprights to ensure full field compliance with current safety standards. Hinged, or any clamps, that require field locating or field drilling or installation are not acceptable, due to the susceptibility of installation out of compliance with safety standards.
 3. Plastisol Coated Steel – Products including decks, platforms, steps, and bridges shall be fabricated from 11-gauge perforated steel with a .08" minimum thickness, textured slip-resistant polyvinyl chloride plastisol dipped coating. Square deck size must be at least 49" x 49" (2,401 square inches), and triangular decks must be equally 49" on all sides (1,040 square inches) and bolt through the uprights. Decks must attach directly to threaded inserts factory installed to uprights, using (2) 3/8" bolts at each upright connection point to eliminate the possibility of deck slipping. Plastisol coating must be free of latex and tested to meet California standards for phthalate levels and safe for children.
 4. Molded Polyethylene – Products are to be rotationally molded plastic with a 1/4" nominal wall thickness. All plastic is to be U.V. stabilized with optional graphics molded into the component during the molding process. Molded products shall have an anti-static additive and be available in any of the manufacturer's standard colors.
 5. High Density Polyethylene shall be made from either 1/2" or 3/4" thick (depending on application used) high density, UV-stabilized and color impregnated polyethylene.
 6. Metal Climbers and Enclosures – Products shall be fabricated from 1 5/16" OD x .083" (14 gauge) wall galvanized steel tubing with vertical members fabricated of 1 1/16" OD x .075 (15 gauge) wall galvanized steel tubing. All tubing used shall be an electrical resistance welded, cold rolled, high strength steel tubing. The exterior coating will consist of an In-line Zinc Flo Coating with a zinc coating of .03 thickness minimum, chromate conversion, and acrylic over- coating. The interior coating will consist of a special organic acrylic modified polyester.

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7. Cables - shall be 18mm polyester twisted type with the following properties: calculated tensile strength of >60kN, quantity 6 strands 2.8mm diameter each, steel strands shall have QTY 19 steel wires diameter .62mm each, quantity 3 fiber core 2.7mm diameter each, UV protected polyester impregnated. Terminations shall be made of the following materials: Aluminum forks, stainless steel D-shackles, stainless steel lifting eye nuts. Connections shall be made of the following: Aluminum connector eggs, aluminum 2-piece T-joints, aluminum T-joints, aluminum in-line connector, aluminum ferrules.
 8. Hardware – All nuts, bolts, screws, inserts, and lock washers used in the assembly of all play equipment shall be stainless steel, yellow dichromate plated steel, blue-coat plated steel, mechanically galvanized or powder coated/yellow dichromate plated steel. All primary fasteners shall be 304 alloy stainless steel. Fasteners with yellow dichromate treatment have an electro-deposited, 99.9% pure zinc substrate applied from a specially formulated solution sealed with a yellow dichromate topcoat designed to work in conjunction with the zinc plating. Yellow dichromate has a 320% longer life to white corrosion and 275% longer to red corrosion than does hot-dip galvanizing. PowerScape Plus stainless-steel fasteners shall be button pin-in head, socket cap screws with a two-part epoxy locking patch added to the threads. The two-part locking patch shall consist of one part resin and one part catalyst which are activated during installation. After curing, the material shall require a minimum of five times the installation torque to remove the fastener. Manufacturer shall provide special installation tools for pinned fasteners.
- C. Primetime
1. Main Structural Uprights
 - a. Shall be 3.5" outside diameter tubing, 1/8" wall thickness, extruded from 6005A-T61 aluminum alloy conforming to ASTM-B-221. Minimum yield strength shall be 35,000 psi and minimum tensile strength shall be 38,000 psi. All upright posts shall be coated with a custom formula TGIC polyester powder coating in conformance with the specification outlined herein.
(AND/OR)
 - b. Shall be 3.5" outside diameter, 13 gauge (nominal .095") galvanized round tubing, manufactured to ASTM A-500 Grade B tolerances from cold-formed steel conforming to ASTM A-1011 Sheet Spec for steel coil. Minimum yield strength shall be 45,000 psi and minimum tensile strength shall be 48,000 psi. The exterior surface is In line Zinc Flo Coating with a zinc coating of .03 thickness minimum, chromate conversion coated, and a clear high performance organic polymer is applied. Galvanizing coverage shall demonstrate the ability to exceed 1000 hours salt spray corrosion exposure in accordance with ASTM B-117. Internal surface zinc rich 91% minimum zinc dust content in organic resin, as per ASTM F-1043. All upright posts shall be coated with a custom formula TGIC.
 2. Component Attachment – Must be factory preset to the uprights to ensure full field compliance with current safety standards. Hinges, or any clamps, that require field locating or field drilling or installation are not acceptable, due to the susceptibility of installation out of compliance with safety standards.
 3. Plastisol Coated Steel – Products including decks, platforms, steps, and bridges shall be fabricated from 12 gauge perforated steel with a .08" minimum thickness, textured slip-resistant polyvinyl chloride plastisol dipped coating. Square deck size must be at least 36" x 36" (1,296 square inches), and triangular decks must be equally 36" on all sides (561 square inches). Decks must attach directly to threaded inserts factory installed to uprights, using (1) 3/8" bolts at each upright connection point to eliminate the possibility of deck slipping. Plastisol coating must be free of latex and tested to meet California standards for phthalate levels and safe for children.
 4. Molded Polyethylene – Products are to be rotationally molded plastic with a ¼" nominal wall thickness. All plastic is to be U.V. stabilized with optional graphics molded into the component during the molding process. Molded products shall have an anti-static additive, and be available in any of the manufacturer's standard colors.

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5. High Density Polyethylene shall be made from either ½" or ¾" thick (depending on application used) high density, UV-stabilized and color impregnated polyethylene.
 6. Metal Climbers and Enclosures – Products shall be fabricated from 1 5/16" OD x .083" (14 gauge) wall galvanized steel tubing with vertical members fabricated of 1 1/16" OD x .075 (15 gauge) wall galvanized steel tubing. All tubing used shall be an electrical resistance welded, cold rolled, high strength steel tubing. The exterior coating will consist of an in line Zinc Flo Coating with a zinc coating of .03 thickness minimum, chromate conversion, and acrylic over- coating. The interior coating will consist of a special organic acrylic modified polyester.
 7. Cables - shall be 18mm polyester twisted type with the following properties: calculated tensile strength of >60kN, quantity 6 strands 2.8mm diameter each, steel strands shall have QTY 19 steel wires diameter .62mm each, quantity 3 fiber core 2.7mm diameter each, UV protected polyester impregnated. Terminations shall be made of the following materials: Aluminum forks, stainless steel D-shackles, stainless steel lifting eye nuts. Connections shall be made of the following: Aluminum connector eggs, aluminum 2-piece T-joints, aluminum T-joints, aluminum in-line connector, aluminum ferrules.
 8. Hardware – All nuts, bolts, screws, inserts, and lock washers used in the assembly of all play equipment shall be stainless steel, yellow dichromate plated steel, blue-coat plated steel, mechanically galvanized or powder coated/yellow dichromate plated steel. All primary fasteners shall be 304 alloy stainless steel. Fasteners with yellow dichromate treatment have an electro-deposited, 99.9% pure zinc substrate applied from a specially formulated solution sealed with a yellow dichromate top coat designed to work in conjunction with the zinc plating. Yellow dichromate has a 320% longer life to white corrosion and 275% longer to red corrosion than does hot-dip galvanizing.
- D. Xscape
1. Main Structural Uprights shall be 3.5" outside diameter, 13 gauge (nominal .095") galvanized round tubing, manufactured to ASTM A-500 Grade B tolerances from cold-formed steel conforming to ASTM A-1011 Sheet Spec for steel coil. Minimum yield strength shall be 45,000 psi and minimum tensile strength shall be 48,000 psi. The exterior surface is In line Zinc Flo Coating with a zinc coating of .03 thickness minimum, chromate conversion coated, and a clear high performance organic polymer is applied. Galvanizing coverage shall demonstrate the ability to exceed 1000 hours salt spray corrosion exposure in accordance with ASTM B-117. Internal surface zinc rich 91% minimum zinc dust content in organic resin, as per ASTM F-1043. All upright posts shall be coated with a custom formula TGIC.
 2. Component Attachment – Must be factory preset to the uprights to ensure full field compliance with current safety standards. Hinges, or any clamps, that require field locating or field drilling or installation are not acceptable, due to the susceptibility of installation out of compliance with safety standards.
 3. Plastisol Coated Steel – Platforms and steps shall be fabricated from 12-gauge perforated steel with a .08" minimum thickness, textured slip-resistant polyvinyl chloride plastisol dipped coating. Platforms must attach directly to support frame, using 3/8" bolts at each connection point. Plastisol coating shall be free of latex and tested to meet California standards for phthalate levels and safe for children. Available in manufacturers standard colors.
 4. Molded Polyethylene – Products are to be rotationally molded plastic with a ¼" nominal wall thickness. All plastic is to be U.V. stabilized with optional graphics molded into the component during the molding process. Molded products shall have an anti-static additive and be available in any of the manufacturer's standard colors.
 5. High Density Polyethylene - Products shall be made from either ½" or ¾" thick (depending on application used) high density, UV-stabilized and color impregnated polyethylene.

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6. Metal Climbers and Enclosures – Products shall be fabricated from 1 5/16" OD x .083" (14 gauge) wall galvanized steel tubing with frames fabricated of 2 3/8" OD x .134 (10 gauge) wall galvanized steel tubing. All tubing used shall be an electrical resistance welded, cold rolled, high strength steel tubing. The exterior coating will consist of an in-line Zinc Flo Coating with a zinc coating of .03 thickness minimum, chromate conversion, and acrylic over-coating. The interior coating will consist of a special organic acrylic modified polyester. All climbers shall be coated with a custom formula TGIC.
7. Cables - shall be 18mm polyester twisted type with the following properties: calculated tensile strength of >60kN, quantity 6 strands 2.8mm diameter each, steel strands shall have QTY 19 steel wires diameter .62mm each, quantity 3 fiber core 2.7mm diameter each, UV protected polyester impregnated. Terminations shall be made of the following materials: Aluminum forks, stainless steel D-shackles, stainless steel lifting eye nuts. Connections shall be made of the following: Aluminum connector eggs, aluminum 2-piece T-joints, aluminum T-joints, aluminum in-line connector, aluminum ferrules.
8. Hardware – All nuts, bolts, screws, inserts, and lock washers used in the assembly of all play equipment shall be stainless steel, yellow dichromate plated steel, blue-coat plated steel, mechanically galvanized or powder coated/yellow dichromate plated steel. All primary fasteners shall be 304 alloy stainless steel. Fasteners with yellow dichromate treatment have an electro-deposited, 99.9% pure zinc substrate applied from a specially formulated solution sealed with a yellow dichromate topcoat designed to work in conjunction with the zinc plating. Yellow dichromate has a 320% longer life to white corrosion and 275% longer to red corrosion than does hot-dip galvanizing.

2.2 REQUIRED COMPONENTS

- A. In addition to the requirements contained in this section, refer to layout drawings and schedules of components and accessories on drawings.
- B. All components, accessories, hardware, and other items required for a complete and usable system shall be provided.

2.3 FINISHES

- A. Polyester (Powder) Coating – The polyester coating shall be uniformly applied by the electrostatic method to a minimum thickness of four mils. Promptly after application of the powder, the coating shall be oven-cured at 350 degrees Fahrenheit. The color(s) of the polyester coating shall be as selected by the Architect from the manufacturer's standard and/or custom color selection charts. The paint process must adhere to the Powder Coat Institute 4000 Certification.
- B. Galvanized Finish – All components shall have a galvanized finish prior to powder coating and shall be protectively coated with ZRP, a zinc primer that forms a rust-resistant barrier layer. All galvanized surfaces shall be free of burs, splinters, and sharp edges.

PART 3 – EXECUTION

3.1 INSTALLATION

- A. General – Comply with manufacturer's written installation instructions.
- B. Uprights – Set posts in concrete footings. Protect finish during installation. Comply with locations, height, and plumb requirements.

3.2 FIELD QUALITY CONTROL

- A. Installation shall be performed by factory certified technicians with at least 3 years' experience installing playground equipment

3.3 COMPLETION

- A. Protect installed products until completion of project.
- B. Touch up, repair, or replace damaged products before substantial completion.

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PLAYGROUND EQUIPMENT

- C. Installer shall turn over all installation instructions, parts lists, maintenance instructions, tool kits, and spare materials to the owner upon completion.

Individual Product Specifications

Ionix

Climbers:

6255 – Sensory Dome® - Small

- 2 3/8" O.D. x .134", 1-1/4" O.D. x .109", 1-5/16" O.D. x .109", and 1-1/4" O.D. x .083" wall
- galvanized steel tubing
- 3/16" hot rolled steel
- 1/2" thick high density, UV-stabilized and color-impregnated polyethylene
- Linear low-density polyethylene
- UV-stabilized color
- Anti-static compound additive One-piece weld assembly
- Coated after fabrication with a custom formula of TGIC polyester powder coating

Music:

6223 – Merry Musical

- 1-5/16" O.D. x .078", 3 1/2" O.D. x 1/8", 1 5/16" O.D. x .083" wall stainless steel tubing
- 3/16" stainless steel
- 1/4"-thick color-impregnated linear low density polyethylene
- 1.315 O.D. aluminum pipe 3/16" x 2" x 3 1/8" aluminum
- 3/4"-thick high density, UV-stabilized and color-impregnated polyethylene
- 6005-T5 aluminum alloy
- All-weld assembly
- Coated after fabrication with a custom formula of TGIC polyester powder coating

Signs:

14927 – NDS Play On Sign Package

- 3 1/2" O.D. x .095" wall galvanized steel tubing
- 1/4"-thick hot rolled steel
- 1/2"-thick exterior DHPL
- All-weld assembly
- Coated after fabrication with a custom formula of TGIC polyester powder coating

Powerscape

Freestanding:

32022 – Hex Pod

- 3.5" O.D. and .095" galvanized round tubing
- 3/16" hot rolled steel
- 3/4"-thick high density, UV-stabilized, laminated, and color-impregnated polyethylene
- Color-impregnated, linear, low-density polyethylene
- All-weld assembly
- Coated after fabrication with a custom formula of TGIC polyester powder coating

32023 – Hex Pod Step

- 3.5" O.D. and .095" galvanized round tubing
- 3/16" hot rolled steel
- 3/4"-thick high density, UV-stabilized, laminated, and color-impregnated polyethylene
- Color-impregnated, linear, low-density polyethylene
- All-weld assembly
- Coated after fabrication with a custom formula of TGIC polyester powder coating

Individual Components:

32000 – 1-Way Vessel

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PLAYGROUND EQUIPMENT

- 1-5/16" O.D. x .083", 2.375" O.D. x .134", and 3 1/2" O.D. x .095" wall galvanized pipe
 - 3/16" hot rolled mounting tab
 - All-weld assembly
 - Coated after fabrication with a custom formula of TGIC polyester powder coating
- 32006 – Tron Climber - Right
- 3 1/2" O.D. x .095" and 2.375" O.D. x .134" wall galvanized pipe
 - 3/16" hot rolled tab
 - 3/4"-thick high density, UV-stabilized, and color-impregnated polyethylene
 - Hybrid resin mixture with a custom formulated UV inhibitor
 - All-weld assembly
 - Coated after fabrication with a custom formula of TGIC polyester powder coating
- 32009 – Hex Topper
- Color-impregnated, linear, low-density polyethylene
- 32020 – Compact Ziggy Rail
- 2.375" O.D. x .165" and 1.029" O.D. galvanized steel pipe
 - All-weld assembly
 - Coated after fabrication with a custom formula of TGIC polyester powder coating

Primetime

Access Components:

- 90033 – Transfer Platform with Barrier
- 10 gauge (.135"-thick) and 3/8" x 3-1/2" hot rolled steel
 - 2 3/8" O.D. x .095", 1-5/16" O.D. x .083", and 2" square x 3/16" wall galvanized steel tubing
 - 11-gauge punched steel
 - All-weld assembly
 - Coated after fabrication with a custom formula of TGIC polyester powder
- 91208 – Climber Entryway - Guardrail
- 1-5/16" O.D. x .083" wall galvanized steel tubing
 - 3/16" hot rolled steel
 - All-weld assembly
 - Coated after fabrication with a custom formula of TGIC polyester powder coating
- 91209 – Climber Entryway - Barrier
- 1-5/16" O.D. x .083" and 1-1/16" O.D. x .075" wall galvanized steel tubing
 - 3/16" hot rolled mounting tabs
 - All-weld assembly
 - Coated after fabrication with a custom formula of TGIC polyester powder coating

Attachments:

- 90297 – Wavy Tree Climber
- 2-3/8" O.D. x .095" and 1-5/16" O.D. x .083" wall galvanized steel tubing
 - 3/16" x 3-1/2" hot rolled flat steel
 - One-piece weld assembly
 - Coated after fabrication with a custom formula of TGIC polyester powder coating
- 90575 – Scramble Up Climber - 6'-6" to 8'-0"
- 1 1/16" O.D. x .072" wall galvanized steel tubing
 - 1/8" and 3/16" hot rolled steel
 - 3/4"-thick high-density, UV-stabilized, laminated and color-impregnated polyethylene
 - One-piece weld assembly
 - Coated with a custom formula of TGIC polyester powder coating
- 90840 – Xcelerator
- 2 3/8" O.D. x .134", 1-5/8" O.D. x .133", 1-5/16" O.D. x .133" wall galvanized steel tubing
 - 1/8", 3/16", and 1/4" hot rolled steel plate
 - 6" diameter 11 gauge hot rolled steel ball
 - All-weld assembly
 - Coated after fabrication with a custom formula of TGIC polyester powder coating

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PLAYGROUND EQUIPMENT

90868 – The Splitter

- 2.375" O.D. x .134", 1-5/8" O.D. x .083", and 1-1/16" O.D. x .072" wall galvanized steel tubing
- 3/16" and 1/4" hot rolled flat steel
- 3/4"-thick (solid) high-density, UV-stabilized and color-impregnated polyethylene
- Coated after fabrication with a custom formula of TGIC polyester powder coating

91324 – Erratic Climber with Hex Net

- 1-5/8" O.D. x .083" and 1-1/16" O.D. x .075" wall galvanized steel tubing
- 1/4" x 2", 1/4", and 3/16" hot rolled flat steel
- 18MM dia. polyamide rope cable
- UV protection
- 6 strands
- 19 steel reinforcing strands within a polyamide sleeve
- Reinforcing steel core
- Stainless steel connector
- Coated after fabrication with a custom formula of TGIC polyester powder

Decks:

80000 – Square Deck - 49"

- 3/16" x 3-1/2", 1/4" x 3-1/2", and 1/8" x 2-1/2" hot rolled steel
- Minimum surface area of 2,381 square inches
- 49" center to center spacing on the upright posts
- 12" support grid underneath the entire deck surface
- One-piece welded assembly
- Coated after fabrication with an oven cured matte finish polyvinyl chloride (PVC) coating
- Directly bolted to the upright posts with eight 3/8" diameter button-pin-in-head, hex socket cap screws

Links:

90024 – Transfer System with Barrier

- 1-5/16" O.D. x .083" and 1-1/16" O.D. x .075", and 2" square x 3/16" wall galvanized steel tubing
- 11 gauge punched steel
- Matte PVC coating
- Protective P&O finish
- All-weld assembly
- Coated after fabrication with a custom formula of TGIC polyester powder coating

90790 – Sloped Funnel Climber Barrier

- 1.315" O.D. x .083" and 1.029" x .075" wall galvanized steel tubing
- 1/8"-thick hot rolled steel
- 3/4"-thick high-density, UV-stabilized, laminated and color-impregnated polyethylene
- Coated after fabrication with a custom formula of TGIC polyester powder coating

Panels:

90227 – World Greetings Language Panel

- 2-1/2"-thick color-impregnated linear low density polyethylene

Playground Covers:

80109 – Perf Metal Peaked Roof

- 14-gauge perforated galvanized steel
- 5" O.D. aluminum tubing
- 3/16" and 1/4"-thick aluminum mounting brackets
- All-welded assembly
- Coated after fabrication with a custom formula of TGIC polyester powder

Slides:

90504 – Single Zip Slide - 4'

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PLAYGROUND EQUIPMENT

- Color-impregnated linear low-density polyethylene
 - Minimum .25" wall thickness
 - Minimum inside bed width of 17.5"
 - Minimum 40" radius
 - Maximum of 4°
 - Integrated drain at 5°
- 90700 – Single Entrance Wilderslide II
- 1-5/8" O.D. x .083" wall galvanized steel tubing
 - 3/16" hot rolled steel
 - Color-impregnated linear low density polyethylene
 - 20" inside diameter
 - 40° maximum slope
 - Minimum 40" radius
 - Maximum of 4°
 - Integrated drain at 5°
 - All-weld assembly
 - Coated after fabrication with a custom formula of TGIC polyester powder coating
- 90704 – Left Curve Section Wilderslide II
- 1-5/8" O.D. x .083" wall galvanized steel tubing
 - 3/16" hot rolled steel
 - Color-impregnated linear low density polyethylene
 - 20" inside diameter
 - 0° maximum slope
 - Minimum 40" radius
 - Maximum of 4°
 - Integrated drain at 5°
 - All-weld assembly
 - Coated after fabrication with a custom formula of TGIC polyester powder coating
- 90705 – Right Curve Section Wilderslide II
- 1-5/8" O.D. x .083" wall galvanized steel tubing
 - 3/16" hot rolled steel
 - Color-impregnated linear low density polyethylene
 - 20" inside diameter
 - 40° maximum slope
 - Minimum 40" radius
 - Maximum of 4°
 - Integrated drain at 5°
 - All-weld assembly
 - Coated after fabrication with a custom formula of TGIC polyester powder coating
- 90762 – Long Exit (For 7' and 8' Slides)
- 1-5/8" O.D. x .083" wall galvanized steel tubing
 - 3/16" hot rolled steel
 - Color-impregnated linear low density polyethylene
 - 20" inside diameter
 - 40° maximum slope
 - Minimum 40" radius
 - Maximum of 4°
 - Integrated drain at 5°
 - All-weld assembly
 - Coated after fabrication with a custom formula of TGIC polyester powder coating

Xscape

Access Components:

- 19001 – Entry Way Handhold
- 1-5/16" O.D. x .083" wall galvanized steel tubing

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PLAYGROUND EQUIPMENT

- 3/16" hot rolled steel
 - All-weld assembly
 - Coated after fabrication with a custom formula of TGIC polyester powder coating
- 19911 – Modern Transfer w/ Barrier
- 1 1/16" O.D. x .072" and 1 5/16" O.D. x .083" wall galvanized steel tubing
 - .083", 3/16", and .109"-thick hot rolled steel
 - Minimum coating thickness of .080"
 - All-weld assembly
 - Coated after fabrication with a custom formula of TGIC polyester powder coating and an oven cured matte finish PVC coating

Attachments:

- 19057 – Wave Climber
- 3/16" x 2-1/2" hot rolled steel
 - Color-impregnated linear low density polyethylene
 - Coated after fabrication with a custom formula of TGIC polyester powder coating
- 19332 – Spiral Step Climber
- 1 21/32" O.D. x .083" and 1 1/32" O.D. x .072" wall galvanized steel tubing
 - 10 gauge hot rolled steel
 - 3/4" HDPE
 - One-piece weld assembly
 - Coated after fabrication with a custom formula of TGIC polyester powder coating

Decks:

- 18200 – 36" Square Deck - Punched Steel
- 12 and 11 gauge punched steel
 - 3/16" x 2-1/2", 1/4" x 2-1/2", and 1/8" x 1" hot rolled steel
 - Minimum surface area: 1,286 square inches
 - 3/8" diameter button head cap screws
 - Protective P&O finish
 - One-piece weld assembly
 - Coated after fabrication with an oven cured matte finish PVC coating
- 18201 – Punched Steel Deck - PrimeTime
- 12 gauge and 11 gauge punched steel
 - 3/16" x 2-1/2", 1/4" x 2-1/2", and 1/8" x 1" hot rolled steel
 - 3/8" diameter button head cap screws
 - Minimum surface area of 556 square inches
 - Protective P&O finish
 - One-piece weld assembly
 - Coated after fabrication with an oven cured matte finish PVC coating
- 19102 – Stepped Deck - 6" Rise
- 3/16" x 3-1/2", 1/4" x 3-1/2", and 1/8" x 2-1/2" hot rolled steel
 - 12 gauge steel
 - 3/8" diameter button-pin-in-head, hex socket cap screws
 - Protective P&O finish
 - One-piece weld assembly
 - Coated after fabrication with an oven cured matte finish PVC coating

Links:

- 19006 – Transfer System with Barrier
- 1-5/16" O.D. x .083", 1-1/16" O.D. x .075", and 2" square x 3/16" wall steel tubing
 - 11 gauge punched steel
 - Protective P&O finish
 - Matte PVC coating
 - All-weld assembly

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PLAYGROUND EQUIPMENT

- Coated after fabrication with a custom formula of TGIC polyester powder coating
- 19718 – Sensory Wave® Climber Up & On Link
 - 3 ½" O.D. X .095" wall galvanized steel tubing and ¼" hot rolled steel
 - Linear low-density polyethylene
 - UV-stabilized color
 - Anti-static compound additive
 - All-weld assembly
 - Coated after fabrication with TGIC powder coating

Playground Covers:

- 19757 – Umbra Square Roof
 - Linear low-density polyethylene
 - UV-stabilized color
 - Anti-static compound additive
- 19762 – Umbra Roof Plug
 - Linear low-density polyethylene
 - UV-stabilized color
 - Anti-static compound additive

Slides:

- 12502 – Lil' Foot Slide Attachment
 - 18-1/2" x 21-1/2" x 62-3/4"
 - One-piece double wall construction
- 19790 – Double Swerve Zip Slide
 - Color-impregnated linear low-density polyethylene
 - Minimum .25" wall thickness
 - Angle of descent: <50°

Attachments:

- 26146 – Cruise Rails
 - 3.5" O.D. x .095", 2 3/8" O.D. x .095", and 1-5/16" O.D. x .083" wall galvanized pipe
 - 3/16" x 4 1/2" stainless steel
 - All-weld assembly
 - Coated after fabrication with a custom formula of TGIC polyester powder coating
- 36000 – Bubble Climbing Wall
 - 3.5" O.D. x .095" galvanized round tubing
 - 2-3/8" O.D. x .095" and 1" O.D. x .072" galvanized pipe
 - 3/16" and 3/16" x 4-1/2" stainless steel
 - EPDM 70-Durometer
 - 3/4"-thick (solid) high density, UV-stabilized, laminated, and color-impregnated polyethylene
 - All-weld assembly
 - Coated after fabrication with a custom formula of TGIC polyester powder coating
- 36001 – Shapes Climbing Wall
 - 3.5" O.D. x .095" galvanized round tubing
 - 2-3/8" O.D. x .095" and 1" O.D. x .072" galvanized pipe
 - 3/16" and 3/16" x 4-1/2" stainless steel
 - EPDM 70-Durometer
 - 3/4"-thick (solid) high density, UV-stabilized, laminated, and color-impregnated polyethylene
 - All-weld assembly
 - Coated after fabrication with a custom formula of TGIC polyester powder coating
- 36076 – Stratus Climber
 - 3.5" O.D. x .095" galvanized round tubing
 - 2-3/8" O.D. x .095" galvanized pipe
 - 3/16" x 4 ½" stainless steel

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PLAYGROUND EQUIPMENT

- Color-impregnated linear low-density polyethylene
- 3/16"-thick hot rolled steel
- EPDM 90-Durometer
- All-weld assembly
- Coated after fabrication with a custom formula of TGIC polyester powder coating

Connectors:

36020 – Single Upright with step

- 3.5" O.D. x .095" galvanized round tubing
- 2-3/8" O.D. x .095" galvanized pipe
- 3/16"-thick hot rolled steel
- 3/16" x 4 1/2" stainless steel
- Color-impregnated, linear, low-density, polyethylene
- EPDM 90 and 70-Durometer
- All-weld assembly
- Coated with a custom formula of TGIC polyester powder

36022 – 90° 2-Way X-Pod Step

- 3.5" O.D. x .095" galvanized round tubing
- 3/16"-thick hot rolled steel
- 2-3/8" O.D. x .095" and 1" O.D. x .072" galvanized pipe
- 6" O.D. ball
- 3/16" x 4 1/2" stainless steel
- Coated with a custom formula of TGIC polyester powder coating
- Color-impregnated linear low-density polyethylene
- EPDM 90-Durometer
- All-weld assembly

36023 – 3-Way X-Pod Step

- 3.5" O.D. x .095" galvanized round tubing
- 3/16"-thick hot rolled steel
- 2-3/8" O.D. x .095" and 1" O.D. x .072" galvanized pipe
- 6" O.D. ball
- 3/16" x 4 1/2" stainless steel
- Coated with a custom formula of TGIC polyester powder coating
- Color-impregnated linear low-density polyethylene
- EPDM 90-Durometer
- All-weld assembly

36031 – Primetime 36 Cross Beam Link - Single

- 2-3/8" O.D. x .095" galvanized pipe
- 3/16" flat and 3/16" x 4 1/2" stainless steel
- All-weld assembly
- Coated after fabrication with a custom formula of TGIC polyester powder coating

Freestanding:

36018 – Graduated Balance Beam - Wide End

- 2-3/8" O.D. x .165" galvanized steel pipe
- 3/16" x 6" x 2-1/2" steel plate
- 3/16" H.R. steel
- EPDM of durometer
- 90 All-weld assembly
- Coated after fabrication with TGIC polyester powder coating

36082 – Freestanding X-Pod Step

- 3.5" O.D. x .095" galvanized round tubing
- 3/16" hot rolled steel
- Color-impregnated linear low-density polyethylene EPDM of durometer 90

SECTION 11680

PLAYGROUND EQUIPMENT

- All-weld assembly
- Coated with a custom formula of TGIC polyester powder

Links:

36013 – Rock Wall Link

- 2-3/8" O.D. x .13" galvanized round pipe
- 1-5/16" O.D. x .083" and 1.66" O.D. x .083" galvanized steel pipe
- 2" x 2" x 3/16" and 3/16" x 4 1/2 flat stainless steel
- 1.66" outside diameter L.W. pipe
- 3/4"-thick (solid) high density, UV-stabilized, laminated, and color-impregnated polyethylene
- Injection-molded polyethylene
- Custom formula of TGIC polyester powder coating

36014 – Arched Chain Net Link

- 1-1/16" O.D. x .072" wall galvanized steel tubing
- 3/8" O.D. x .165" galvanized steel pipe
- 3/16" x 1-1/4" x 1-7/8" and 3/16" x 4-1/2" flat stainless steel
- 1" O.D. x .075" stainless steel tubing
- 7/32", 4/0 welded stainless steel link chain
- All-weld assembly
- Coated after fabrication with a custom formula of TGIC polyester powder

36015 – Pod Rocker

- 1-5/16" O.D. x .109" wall galvanized steel tubing
- 12 gauge x .109" hot rolled flat steel
- 1-1/16" dia. cold rolled steel rod
- 1/4" x 2" x 1-13/16" stainless steel tab
- 2-3/8" O.D. x .13" galvanized steel pipe
- 3/16" flat stainless steel
- Color-impregnated, rotationally molded, linear, low density polyethylene
- All weld assembly
- Coated after fabrication with a custom formula of TGIC polyester powder

36017 – Hex-Pod Step

- 3.5" O.D. x .095" galvanized round tubing
- 3/16" hot rolled steel
- Color-impregnated linear low-density polyethylene EPDM of durometer 90
- All-weld assembly
- Coated with a custom formula of TGIC polyester powder

Miscellaneous:

26094 – Triangular Shroud

- EPDM 90-Durometer

END OF SECTION

SECTION 12490

WINDOW TREATMENTS

PART 1 – GENERAL

1.1 SECTION INCLUDES

- A. Roller Shades

1.2 RELATED SECTIONS

- A. Section 06100 – Rough Carpentry: Blocking and framing for support.

1.3 REFERENCES

- A. ASTM B221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes.

1.4 SUBMITTALS

- A. Submit under provisions of Section 01300.
- B. Product Data: Manufacturer's data sheets on each product to be used, including:
 - 1. Preparation instructions and recommendations.
 - 2. Storage and handling requirements and recommendations.
 - 3. Installation methods.
- C. Shop Drawings: Provide interior elevation of each opening to receive blinds with dimensioned widths, clearances and attachment details. Include location of wall switch.
- D. Selection Samples: For each finish product specified, two complete sets of fabric color swatches representing manufacturer's full range of available colors and patterns.
- E. Verification Samples: For each finish product specified, two samples, representing actual product, color, and patterns.

1.5 QUALITY ASSURANCE

- A. Manufacturer Qualifications: ISO 9001 certified with manufacturing experience of at least 5 years.
- B. Installer Qualifications: Trained and certified by manufacturer for installation type required.
- C. Mock-Up: Provide a mock-up for evaluation of surface preparation techniques and application workmanship.
 - 1. Finish areas designated by Architect.
 - 2. Do not proceed with remaining work until workmanship, color, and sheen are approved by Architect.
- D. Refinish mock-up area as required to produce acceptable work.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Store products in manufacturer's unopened packaging until ready for installation.
- B. Store and dispose of solvent-based materials, and materials used with solvent-based materials, in accordance with requirements of local authorities having jurisdiction.

1.7 PROJECT CONDITIONS

- A. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's absolute limits.

1.8 WARRANTY

- A. Manufacturer warrants that products will be free of defects in material and workmanship, under normal use and service and subject to the conditions of the contract.
 - 1. Shade Assembly: Lifetime limited warranty.
 - 2. Fabric: Three year limited warranty.
 - 3. Electrical Components: Two year limited warranty.

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WINDOW TREATMENTS

PART 2 – PRODUCTS

2.1 MANUFACTURERS

- A. Basis of Design: Hunter Douglas: Phone: (800) 789-0331, Web: www.hunterdouglas.com
- B. Substitutions: See Section 01600 – Product Requirements

2.2 SHADES

- A. Product: RB 500 Manual Roller Shades. Standard or Heavy Duty, depending on size of roller for opening; as manufactured by Hunter Douglas, Inc.
 - 1. Minimum Width: 3'-0", Refer to Drawings for window sizes.
 - 2. Minimum Height: 15'-0", Refer to Drawings for window sizes.
 - 3. Utilize 3" Fascia, mount to inside of window mullion (reference detail). Bracket and mounting hardware to be the same color.
 - 4. Fascia and Bracket Color: To be selected from Manufacturer's full range of color selections.
 - 5. Control: Manual Chain operation

2.3 FABRIC

- A. Product: SheerWeave 2500 by Hunter Douglas, Inc.
 - 1. Openness: 1%
 - 2. Color: To be selected from Manufacturer's full range of color selections.

PART 3 – EXECUTION

3.1 EXAMINATION

- A. Do not begin installation until substrates have been properly prepared.
- B. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

3.2 PREPARATION

- A. Clean surfaces thoroughly prior to installation.
- B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

3.3 INSTALLATION

- A. Install in accordance with manufacturer's instructions at each window as indicated on Architectural drawings.

3.4 PROTECTION

- A. Protect installed products until completion of project.
- B. Touch-up, repair or replace damaged products before Substantial Completion

END OF SECTION