# Project Manual for 2023 Athens Park Development

**Bids to be delivered by 2:00 PM, October 19, 2023 to**
Centennial Community Center
16028 127th Street
Lemont, IL 60439

Prepared for:
The Lemont Park District
630-257-6787

Prepared by:

DesignPerspectives INC.
Grounded in Creativity

1167 Hobson Mill Drive
Naperville, Illinois 60540
630-606-0776

September 21, 2023

**2023 Athens Park Development**
**Table Of Contents**

DIVISION & SECTION TITLE

# DIVISION 0

# BID INFORMATION, CONTRACT DOCUMENTS & GENERAL CONDITIONS

# AD FOR BID

Notice is hereby given to potential Bidders that the Lemont Park District will be receiving sealed bids for 2023 Lemont Park District Athens Park Development. The Work for this project primarily consists of the construction of a new community park. The work consists of demolition and removals, remediation work, site grading and drainage, concrete flatwork and curbing, asphalt paving, shelter construction, bandshell construction, electrical work, dog park construction, playground installation, safety surface installation, fence installation, site furnishings and landscaping.

Digital Bid Documents will be available on Thursday, September 21, 2023, and may be obtained from the BHFX Digital Imaging Plan room. The BHFX phone number for the Warrenville, IL location is (630) 393-0777. Plans can be obtained through www.bhfxplanroom.com. Contractors may obtain electronic bid documents through BHFX in pdf format via internet download and/or can elect for paper copies all at the contractor's expense.

Please contact Design Perspectives, Inc. at (630) 606-0776 with any general questions regarding this project. **A non-mandatory pre-bid meeting and site walk through will be held at the project site at 3:00 pm Monday, September 25, 2023. The address is 20 Stephen Street, Lemont, IL 60439.**

Each bid must be placed in a sealed opaque envelope clearly marked **"Sealed Bid: 2023 Athens Park Development"** and addressed to the Lemont Park District, Centennial Community Center, 16028 127th Street, Lemont, IL 60439. Bids will be received until 2:00 pm, on October 19, 2023, at which time the bid proposals will be publicly opened and read aloud at the Centennial Community Center, 16028 127th Street, Lemont, IL 60439.

This project is being financed, in part, with funds from the Illinois Department of Natural Resources, "Open Space Lands Acquisition & Development" (OSLAD) grant program. Minority businesses are encouraged to submit bids for this Project and the successful Contractor is encouraged to utilize qualified minority businesses as sub-contractors for supplies, equipment, services, and construction. There is no required minimum percentage of utilization for minority business participation to meet grant requirements.

The Lemont Park District Board of Park Commissioners reserves the right to waive all technicalities, to accept or reject any or all bids, to accept only portions of a proposal and reject the remainder without disclosure for any reason. Failure to make such a disclosure will not result in accrual of any right, claim or cause of action by any Bidder against the Lemont Park District. The Lemont Park District will award the Contract to the lowest most responsible and responsive Bidder, as determined by the Park District. After bid opening, no bids may be withdrawn, and all bids shall remain firm for ninety (90) days. After submission of the bid, no complaint or claim that there was any misunderstanding in regard to the scope of work and associated costs listed for bidding will be considered.

Bids shall not include federal excise tax or state sales tax for materials and equipment to be incorporated in, or fully consumed in the performance of, the Work. An Exemption Certificate will be furnished by the Lemont Park District on request of the Bidder, for use in

connection with this Project only.

The Work of this Project is subject to the Illinois *Prevailing Wage Act*, 820 ILCS 130/0.01 *et seq*. A prevailing wage determination has been made by the Park District, which is the same as that determined by the Illinois Department of Labor for public works projects in Cook County. The Contract entered into for the Work will be drawn in compliance with said law and proposals should be prepared accordingly and provide for payment of all laborers, workmen, and mechanics needed to perform the Work at no less than the prevailing rate of wages (including the prevailing rate for legal holiday and overtime work in and as applicable) for each craft, type of worker, or mechanic.

All bid proposals must be accompanied by a bid bond or bank cashier's check payable to the Lemont Park District for ten percent (10%) of the amount of the bid as provided in the Instructions to Bidders. No proposals or bids will be considered unless accompanied by such bond or check.

The Contractor selected will also be required to comply with all applicable federal, state and local laws, rules, regulations and executive orders including but not limited to those pertaining to equal employment opportunity.

By order of the Board of Park Commissioners of the Lemont Park District.

# INSTRUCTION TO CONTRACTORS

A. SCOPE

The Contractor shall furnish all labor, materials, tools and equipment required to complete the construction indicated in these Drawings and Specifications.

B. PROJECT IDENTIFICATION AND LOCATION
Project Identification: 2023 Athens Park Development
Project Owner: Lemont Park District – 16028 127th Street Lemont, IL 60439
Project Location:
1. Athens Park – 20 Stephen Street, Lemont, IL 60439

| | |
|---|---|
| Board Approval: | **November 7, 2023** |
| Commencement of Work: | **December 1, 2023** |
| Completion: | **December 1, 2024** |

C. RECEIPT AND OPENING OF BIDS

1. Sealed bids shall be received by, 2:00 pm, Thursday, October 19, 2023, at the Centennial Community Center, 16028 127th Street, Lemont, IL 60439.

2. The Park District reserves the right to reject any or all bids and to waive any formality or technicality in any Proposal in the interest of the Park District.

3. Bid shall be valid for 90 days after opening.

D. PREPARATION OF BIDS

1. Each bid shall be submitted on the Proposal Form furnished in these documents.

2. All bids must be written in black ink or typewritten, and signed with the legal signature of the Contractor, and enclosed in an opaque envelope, sealed, and clearly addressed as follows:

**SEALED BID – 2023 ATHENS PARK DEVELOPMENT**

The envelope shall also contain the name and address of the Contractor.

E. EXAMINATION

1. Each Contractor shall first examine the site, taking into consideration all such conditions that may affect this work. A submission of a proposal implies that this examination has been made.

2. Each Contractor shall examine each and every part of these Specifications and Drawings in order to comply with all requirements.

3. After submission of the bid, no complaint or claim that there was any misunderstanding in regard to the scope of work and associated costs listed for bidding will be considered.

F. QUALIFICATIONS OF CONTRACTOR

The Park District may take action deemed necessary to investigate the qualifications of each Contractor. Each Contractor shall complete the affidavit of experience form in these Bid Documents and submit such form with the proposal form. The Park District reserves the right to qualify or disqualify Contractors as a result of lack of similar project experience and/or any other information obtained from the affidavit of experience form.

G. ADDENDA AND INTERPRETATION

All interpretations and requests for interpretations of the Bid Documents shall be made in writing. Any addenda shall become part of the Contract Documents.

H. BID GUARANTEE

Where a Bid Guarantee is required by the Invitation to Bid, failure to furnish a Bid Guarantee in the proper form and amount, by the time set for the opening of bids, may cause for rejection of the bid, in the absolute discretion of the Owner.

A Bid Guarantee shall be in the form of a bid bond, postal money order, certified check, or cashier's check made payable to the Owner. Bid Guarantees, other than those stated, will be returned (a) to unsuccessful Bidders as soon as practicable after the award of job, and (b) to the successful Bidder upon execution of such further contractual documents and bonds as may be required by the bid as accepted.

The successful Bidder, upon being given a written "Notice of Award", will have the (10) calendar days to provide the required Labor and Material Payment Bond, Performance Bond, and Insurance Policies or Certificates for same, and commence with the work. Failure to comply with the conditions set forth in the Contract Documents shall result in the termination of the contract for default. In such event, the Contractor may be liable for any costs of performing the work which exceed the amount of their bid, and the Bid Guarantee shall be available toward offsetting such difference, if not previously returned to the Contractor.

I. CONTRACT DOCUMENTS

The Contractor to whom the project is awarded will be required to enter into a contract with the Lemont Park District for the extent of the work and contractual amount until the completion of the agreed work. The awarded Contractor will be required to enter into a contract with the Lemont Park District within ten (10) days after acceptance of the bid price.

J. SUBMITTAL OF PLANS AND SPECIFICATIONS

**Before commencing work, the Contractor shall submit for approval the manufacturer's information covering all materials and equipment that it proposes to furnish. The Owner has all final approvals on colors. This will require a written approval by the Owner prior to the purchase of these items**. The Contractor shall commence no work nor purchase any materials prior to the approval of the submittals. Approval of the submittals by the Owner shall not be considered a waiver of any provisions of the specifications nor shall they be construed to permit a waiver from any of the performance criteria required at the final inspection.

K. MATERIALS

All materials supplied by the Contractor under the provisions of these Specifications and Plans shall be new materials of the kind and character called for. Defective equipment or material damaged in the course of installation or tests shall be replaced or repaired in a manner satisfactory to the Owner. All material and equipment to be furnished under these Specifications shall be the standard product of a manufacturer regularly engaged in the production of such material and shall be the manufacturer's current standard design.

L . SUBSTITUTION OF MATERIALS

The materials specified have been determined to have the characteristics appropriate for the purpose of the project. In the event, however, the clause "or equal" is used in the Bidding Documents pertaining to the material or article, the use of an alternate article other than that specified must be submitted for written approval of the Owner or his representative before purchase/use. Any changes proposed by Contractor and/or the Owner that are requested to meet Project Requirements (Such as time) but may offer an advantage to the Contractor or the Owner will be considered for a possible substitution during the project.

M. AWARDING OF CONTRACT

1. Bids will be presented to the Board of Commissioners for approval during a November 2023 regular or special board meeting.

2. Contract will be awarded to the lowest and most responsible Bidder as determined by the Park District.

N. COMPLETION OF CONTRACT WORK

**All work contained in these documents shall be completed no later than as follows:**

**Athens Park Development – December 1, 2024**

O. BASIS OF PAYMENT

Payments shall be made for ninety (90%) percent of the bid price upon completion of work or portion thereof. The balance of ten (10%) percent shall be paid after receipt of final waivers of lien for all materials used and within sixty (60) days of work completion.

P. GOVERNING LAWS AND REGULATIONS

The Contractor to whom the work is awarded shall perform all work and use only those materials that conform to city, state and federal codes regarding health, safety and welfare. The Lemont Park District and its consultant, Design Perspectives, shall be held faultless for failure of work and material that does not conform to such codes. The Contractor shall comply with Equal Opportunity clause required by the Illinois Fair Employment Practices Commission. The Contractor shall also comply with all reporting requirements for Prevailing Wages for Construction Trades as required by the Illinois Department of Labor for Cook County.

Q. OSLAD REQUIREMENTS

The following are specific to the OSLAD grant:

1. Steel Products Procurement Act (30 ILCS 565 et seq.): The Contractor, if applicable, hereby certifies that any steel products used or supplied in accordance with this Award for a public works project shall be manufactured or produced in the United States per the requirements of the Steel Products Procurement Act (30 ILCS 565 et seq.).

2. Illinois Works Jobs Program Act (30 ILCS 559/20-1 et seq.): For grants with an estimated total project cost of $500,000 or more, the Park District will be required to comply with the Illinois Works Apprenticeship Initiative (30 ILCS 559/20-20 to 20-25) and all applicable administrative rules. The "estimated total project cost" is a good faith approximation of the costs of an entire project being paid for in whole or in part by appropriated capital funds to construct a public work. The Contractor, if required, shall meet the goal of the Illinois Apprenticeship Initiative is that apprentices will perform either 10% of the total labor hours actually worked in each prevailing wage classification or 10% of the estimated labor hours in each prevailing wage classification, whichever is less. The Park District will be permitted to seek from the Department a waiver or reduction of this goal in certain circumstances pursuant to 30 ILCS 559/20-20(b). The Park District with the Contractor must ensure

compliance for the life of the entire project, including during the term of the grant and after the term ends, if applicable, and will be required to report on and certify its compliance.

R. ILLINOIS PREFERENCE ACT REQUIREMENTS

Each Contractor shall comply with requirements of the **Employment of Illinois Workers on Public Works Act** (Illinois Preference Act)

This Act requires contractors to use at least 90% Illinois laborers on all public works projects that receive State funds or funds administered by the State during a period of excessive unemployment. Excessive unemployment is defined as any month immediately following 2 consecutive calendar months that the Illinois unemployment rate exceeds 5%. Civil penalties may be imposed on employers who hire non-Illinois workers on State public works projects.

"Employment of Illinois Workers on Public Works Act", Illinois Revised Statues, 30 ILCS 570/1-7.

Copy of legislation can be found at https://www2.illinois.gov/idol/Laws-Rules/CONMED/Pages/illinois-preference-act.aspx

## PREVALING WAGES

A. Each Contractor shall comply with requirements of "An Act regulating wages of laborers, mechanics and other workmen employed in any public works by the State, County, City or by any public body or any political subdivision or by anyone under contract for public works."

B. If, during the course of work under this contract, the Department of Labor revises the prevailing rate hourly wages to be paid under this contract for any trade or occupation, Owner, will notify Contractor and each Subcontractor of the changes in the prevailing rate of hourly wages. Contractor shall have the sole responsibility and duty to ensure that the revised prevailing rate of hourly wages is paid by Contractor and all Subcontractors to each worker to whom a revised rate is applicable. Revisions to the prevailing wage as set forth above shall not result in an increase in the Contract Sum.

C. Contractor shall follow all State, County, City or by any public body provisions for prevailing wages.

1. The Contractor and each Subcontractor shall pay not less than the general prevailing rate of hourly wages for work of a similar character in the locality in which the work is performed and not less than general prevailing rate of hourly wages for legal holidays and overtime work in the performance of work under this Contract, as established by the Illinois Department of Labor, pursuant to an act of the General Assembly of the State of Illinois. In accordance with applicable law, Contractor and each Subcontractor shall keep an accurate record showing the names and occupation of all laborers, workers and mechanics employed by them, and also showing the actual hourly wages paid to each such individual, which records shall be certified and submitted in accordance with State law and which shall be filed with the Illinois Department of Labor as required by law. The Contractor and each Subcontractor hereby agree, jointly and severally, to defend, indemnify and hold harmless the Owner from any and all claims, demands, liens or suits of any kind or nature whatsoever (including suits for injunctive relief) by the Illinois Department of Labor under the Illinois Prevailing Wage Act and Illinois Preference Act, or by any laborer, worker or mechanic employed by the Contractor or the Subcontractor who alleges that he has been paid for his services in a sum less than prevailing wage rates required by Illinois law. The Owner agrees to notify the Contractor or Subcontractor of the pendency of any such claim, demand, lien or suit. Contractor must pay prevailing wages in effect at time labor is performed.

D. The Illinois Department of Labor publishes the prevailing wage rates on its website at http://www.state.il.us/agency/idol/rates/rates.HTM. The Department revises the prevailing wage rates and the Contractor/subcontractor has an obligation to check the Department's website for revisions to prevailing wage rates. For information regarding current prevailing wage rates, please refer to the Illinois Department of Labor's website.

## CONTACT INFORMATION

**Owner/Project Manager:**

Mr. Jason Khuen, CPRP, CPO
Director of Maintenance and Planning
Lemont Park District
16028 127th Street
Lemont, IL 60439

Phone: (630) 257-6787 x 3204
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**Landscape Architect:**

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1167 Hobson Mill Drive
Naperville, IL 60540

Phone: (630) 606-0776
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**Architect:**

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223 W Jackson Boulevard
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**Civil Engineer:**

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# PROPOSAL FORM

**OWNER**: **Lemont Park District**
**16028 127th Street**
**Lemont, IL 60439**

**PROJECT: 2023 Athens Park Development**

Bids shall be received on or before 2:00 pm, Thursday, October 19, 2023, at the Centennial Community Center, 16028 127th Street, Lemont, IL 60439.

## A. ACKNOWLEDGEMENTS

1. Receipt of Documents: Contractor has received a complete set of specifications and plans and understands the meaning of their content and shall willingly comply with the guidelines set forth in these documents.
___Yes; ___No.

2. Identification of Documents Received: The following is a general checklist of documents that should appear in the Bid Documents. Please complete the checklist and contact the Park District if any of the documents have been omitted. (Refer to the Table of Contents for specific documents)

| | Yes | No |
|---|---|---|
| BIDDING INFORMATION & CONTRACT REQUIREMENTS | ___ | ___ |
| DIVISION 1 – GENERAL REQUIREMENTS | ___ | ___ |
| DIVISION 2 – TECHNICAL SPECIFICATIONS | ___ | ___ |

**B. PROPOSAL**

## PROPOSAL FORM – 2023 ATHENS PARK DEVELOPMENT

Sealed Bids shall be received on or before 2:00 pm, Thursday, October 19, 2023 at the Centennial Community Center, 16028 127th Street, Lemont, IL 60439.

**ATHENS PARK**

| Item | Description | Approx. Quantity | Unit | Unit Price | Subtotal |
|---|---|---|---|---|---|

**A. MOBILIZATION & PROJECT START UP**

1. Project & site mobilization including all construction staking, temporary bathroom, plastic construction fence in general work areas, metal construction fence at playground area and bond costs.

For Completing Mobilization & Project Start Up Item 1 Lump Sum _____

**B. DEMOLITION & REMOVALS**

1. Remove all items including all footings, misc. site elements, wells, concrete walks, curbing and footings, asphalt paving & aggregate base, **tree stumps & organic debris**, fencing and any other incidental items as shown and/or noted on Plans. Haul off and legally dispose of materials from the site. **Tree Removal will be by the Owner.**

For Completing Demolition & Removals Item 1 Lump Sum _____

**C. SITE REMEDIATION**

1. Cut, fill and abandon existing monitoring wells as identified on drawings and per the requirements indicated.

2. Cut, modify and cap existing monitoring wells as identified and per requirements indicated to accommodate new site grading

3. Provide new product removal system as indicated on plans, including new wells, monitoring shed, pumps, piping and solar system.

For Completing Site Remediation Items 1, 2 & 3 Lump Sum _____

**D. GRADING & DRAINAGE**

1. Strip and stockpile all useable topsoil encountered during grading operations. Topsoil will be used to fulfill the requirements of this project.

| Item | Description | Approx. Quantity | Unit | Unit Price | Subtotal |
|---|---|---|---|---|---|
| 2. | Perform all grading and excavation to obtain subgrade for pavements and site elements, install stone and other grading requirements as shown or noted on Plan and in accordance with the specifications. | | | | |
| 3. | Place and spread all imported soils provided to fulfill the requirements of this project. | | | | |
| 4. | Re-spread stockpiled cleaned topsoil 6" thick over all prepared subgrades within landscape areas. **Additional Topsoil that is required to meet project requirements will be provided and stockpiled on-site by the Owner.** | | | | |
| 5. | Furnish & Install All Erosion Control Measures as Shown on Plans. This includes wash-out stations and dumpsters. | | | | |
| For Completing Grading Items 1, 2, 3, 4 & 5 | | | | Lump Sum | _____ |
| **E.** | **STORM DRAINAGE** | | | | |
| 1. | 8" PVC Pipe | 58 | LF | _____ | _____ |
| 2. | 10" PVC Pipe | 80 | LF | _____ | _____ |
| 3. | 12" PVC Pipe | 91 | LF | _____ | _____ |
| 4. | 12" RCP Pipe | 92 | LF | _____ | _____ |
| 5. | 18" PVC Pipe | 227 | LF | _____ | _____ |
| 6. | 4" Perf PVC | 562 | LF | _____ | _____ |
| 7. | 4" PVC | 552 | LF | _____ | _____ |
| 8. | 8" PVC Culvert | 50 | LF | _____ | _____ |
| 9. | Wetland Inlet Control Structures | 2 | EA | _____ | _____ |
| 10. | Catch Basin 2' Dia. Nyloplast | 4 | EA | _____ | _____ |
| 11. | Catch Basin 4' Dia. Storm Quality Treatment Device | 1 | EA | _____ | _____ |

| Item | Description | Approx. Quantity | Unit | Unit Price | Subtotal |
|---|---|---|---|---|---|
| 12. | Dry Well Inlet | 17 | EA | _____ | _____ |
| 13. | Storm Manhole 4' Dia. with Outlet Control Structure | 1 | EA | _____ | _____ |
| 14. | 12" Flared End Section With Grate | 2 | EA | _____ | _____ |
| 15. | OBS Well/Cleanouts | 3 | EA | _____ | _____ |
| 16. | Wye Connections | 2 | EA | _____ | _____ |
| 17. | Rip Rap | 1 | LS | _____ | _____ |
| **F.** | **PARKING LOT CONSTRUCTION** | | | | |
| 1. | Asphalt Pavement (Binder & Surface Course) (Parking Lot) | 3,525 | SY | _____ | _____ |
| 2. | Pavers Pavement (Parking Lot) | 10,250 | SF | _____ | _____ |
| 3. | B6.12 Curb & Gutter | 1,550 | LF | _____ | _____ |
| 4. | Asphalt Paving Path Connector | 150 | SY | _____ | _____ |
| 5. | Type 201 5" Concrete Paving (Parking Lot) | 4,720 | SF | _____ | _____ |
| 6. | Parking Lot Pavement Striping | 1 | LS | _____ | _____ |
| 7. | Parking Lot Signs & Posts | 1 | LS | _____ | _____ |
| 8. | Furnish & Install Truncated Domes | 1 | LS | _____ | _____ |
| 9. | Furnish & Install Bollards | 4 | EA | _____ | _____ |

| Item | Description | Approx. Quantity | Unit | Unit Price | Subtotal |
|---|---|---|---|---|---|
| **G.** | **GENERAL PAVING WALKS & PATHS** | | | | |
| 1. | Type 201 5" Concrete Paving (Bench & Bike Pads) | 210 | SF | _____ | _____ |
| 2. | Type 201 5" Concrete Paving (Port-A-Potty) | 880 | SF | _____ | _____ |
| 3. | Type 202 Asphalt Pavement (Park Pathway) | 2,800 | SY | _____ | _____ |
| **H.** | **PLAYGROUND CONSTRUCTION** | | | | |
| 1. | **Install Only** Complete Playground by Burke (Play Illinois) (All Playground Footings in Sono tubes)<br><br>Playground Equipment Includes:<br>a. 2-12 Age Group Playstructure<br>b. Brava Universal Swing<br>c. Swing Set<br>d. Movmnt Xtreme Freestanding<br>e. Volta Inclusive Spinner<br>f. Rockit Tunnel | 1 | LS | _____ | _____ |
| 2. | Type 201 5" Curb Faced Concrete Paving (Playground) | 3,500 | SF | _____ | _____ |
| 3. | Type A Concrete Shelter Footing | 1 | EA | _____ | _____ |
| 4. | Type 204 4" Pour-In-Place Rubber Safety Surface with 4" Stone Base With PIP Transition (See Detail) | 3,200 | SF | _____ | _____ |
| 5. | Type 205 EWF Wood Loose Fill Safety Surface With Filter Fabric | 210 | CY | _____ | _____ |
| 6. | Install Only 14' SQ Metal Park Shelter with Tongue & Groove Ceiling | 1 | EA | _____ | _____ |

| Item | Description | Approx. Quantity | Unit | Unit Price | Subtotal |
|---|---|---|---|---|---|
| 7. | Install Only 6' Bench Surface Mount | 5 | EA | _____ | _____ |
| 8. | Install Only Standard 4 Seat Picnic Table Surface Mount | 1 | EA | _____ | _____ |
| 9. | Install Only ADA 3 Seat Picnic Table Surface Mount | 1 | EA | _____ | _____ |
| 10. | Install Only Litter Can Surface Mount | 1 | EA | _____ | _____ |
| 11. | Install Only Recycling Can Surface Mount | 1 | EA | _____ | _____ |
| 12. | Install Only Bike Rack Surface Mount | 1 | EA | _____ | _____ |
| **I.** | **DOG PARK CONSTRUCTION** | | | | |
| 1. | Type 201 5" Concrete Paving | 750 | SF | _____ | _____ |
| 2. | Type 204 Artificial Turf with 4" Stone Base | 535 | SF | _____ | _____ |
| 3. | Furnish & Install 4' Black Vinyl Coated Line Fence | 990 | LF | _____ | _____ |
| 4. | Furnish & Install 4' Black Vinyl Coated Line Fence Single Gates (4' Opening) | 5 | EA | _____ | _____ |
| 5. | Furnish & Install 4' Black Vinyl Coated Line Fence Double Gate (12' Opening) | 1 | EA | _____ | _____ |

| Item | Description | Approx. Quantity | Unit | Unit Price | Subtotal |
|---|---|---|---|---|---|
| 6. | Install Only Dog Agility Course Equipment<br><br>Agility Equipment Includes:<br>a. Dog Stations (5 Pieces)<br>b. Litter Can (1 Piece)<br>c. Bridge – Stairs and Ramp (1 Piece)<br>d. Slide – Large (1 Piece)<br>e. Leash Post (2 Pieces)<br>f. Adjustable Jump Bar (1 Piece)<br>g. Archway Run (1 Piece)<br>h. A Ramp (1 Piece) | 1 | LS | _____ | _____ |
| 7. | Install Only Litter Can Surface Mount | 1 | EA | _____ | _____ |
| 8. | Install Only Entry/ Welcome Sign Surface Mount | 2 | EA | _____ | _____ |
| **J.** | **WEST SHELTER CONSTRUCTION** | | | | |
| 1. | Type 201 5" Concrete Paving | 2,250 | SF | _____ | _____ |
| 2. | Type B Concrete Shelter Footings | 4 | EA | _____ | _____ |
| 3. | Install Only 20' x 34' Metal Park Shelter with Tongue & Groove Ceiling | 1 | EA | _____ | _____ |
| 4. | Masonry Stone Veneer Columns with Pre-Cast Cap | 4 | EA | _____ | _____ |
| 5. | Install Only Standard 4 Seat Picnic Table Surface Mount | 5 | EA | _____ | _____ |
| 6. | Install Only ADA 3 Seat Picnic Table Surface Mount | 1 | EA | _____ | _____ |

| Item | Description | Approx. Quantity | Unit | Unit Price | Subtotal |
|---|---|---|---|---|---|
| 7. | Install Only Litter Can Surface Mount | 1 | EA | _____ | _____ |
| 8. | Install Only BYOB Bags In-Ground | 2 (Pair) | LS | _____ | _____ |
| 9. | Install Only Ping Pong Table In-Ground | 1 | EA | _____ | _____ |
| 10. | Install Only Bike Rack Surface Mount | 1 | EA | _____ | _____ |
| **K.** | **VILLAGE BIKE PATH CONSTRUCTION** | | | | |
| 1. | Mass Grading of Earth Embankment | 1 | LS | _____ | _____ |
| 2. | Type 201 5" Concrete Paving (Circular Bike Plaza/ Roundabout) | 1,450 | SF | _____ | _____ |
| 3. | Type 202 Asphalt Pavement (Bike Pathway) | 565 | SY | _____ | _____ |
| 4. | Type 204 Artificial Turf with 4" Stone Base | 450 | SF | _____ | _____ |
| **L.** | **ART HISTORY PLAZA CONSTRUCTION** | | | | |
| 1. | Type 201 5" Concrete Paving | 2,100 | SF | _____ | _____ |
| 2. | Type 203 Concrete Pavers | 700 | SF | _____ | _____ |
| 3. | Concrete Foundation (See Structural Plans) | 1 | LS | _____ | _____ |
| 4. | Art History Structure (See Architectural Plans) | 1 | LS | _____ | _____ |
| 5. | Install Only Flagpole with Foundation | 1 | LS | _____ | _____ |

| Item | Description | Approx. Quantity | Unit | Unit Price | Subtotal |
|---|---|---|---|---|---|
| 6. | Install Only Litter Can Surface Mount | 1 | EA | _____ | _____ |
| 7. | Install Only Standard 4 Seat Picnic Table SiteScapes Surface Mount | 1 | EA | _____ | _____ |
| 8. | Install Only ADA 3 Seat Picnic Table SiteScapes Surface Mount | 1 | EA | _____ | _____ |
| 9. | Install Only Solar Umbrella SiteScapes | 2 | EA | _____ | _____ |

**M. BANDSHELL CONSTRUCTION**

1. Furnish & install complete bandshell construction as shown on plans to fulfill the intent of the plans, specifications and details. (See Architectural & Structural Plans)

For Completing Bandshell Construction Item 1 Lump Sum _____

**N. SITE ELECTRICAL CONSTRUCTION**

1. Furnish & install electrical work to include the installation of all fixtures, poles, feeders, circuits, controls, and miscellaneous appurtances to fulfill the intent of the plans, specifications and details.

For Completing Site Electrical Construction Item 1 Lump Sum _____

**O. GENERAL FENCING CONSTRUCTION**

| | | | | | |
|---|---|---|---|---|---|
| 1. | Furnish & Install 4' Vinyl Coated Chain Link Fence (Boundary) | 1,600 | LF | _____ | _____ |
| 2. | Furnish & Install 4' Black Vinyl Coated Line Fence Double Gate (12' Opening) | 2 | EA | _____ | _____ |

| Item | Description | Approx. Quantity | Unit | Unit Price | Subtotal |
|---|---|---|---|---|---|
| **P.** | **SITE FURNISHINGS** | | | | |
| 1. | Install Only 6' Bench Surface Mount (Pathway) | 3 | EA | _____ | _____ |
| 2. | Port-A-Potty Structure (See Architectural Plans) | 1 | LS | _____ | _____ |
| **Q.** | **LANDSCAPE PLANTING (See Landscape Plans)** | | | | |
| 1. | Furnish & Install Deborah Norway Maple | 5 | EA | _____ | _____ |
| 2. | Furnish & Install Redpointe Maple | 1 | EA | _____ | _____ |
| 3. | Furnish & Install Armstrong Freeman Maple | 1 | EA | _____ | _____ |
| 4. | Furnish & Install Early Glow Buckeye | 2 | EA | _____ | _____ |
| 5. | Furnish & Install European Hornbeam | 1 | EA | _____ | _____ |
| 6. | Furnish & Install Northern Catalpa | 2 | EA | _____ | _____ |
| 7. | Furnish & Install Turkish Filbert | 3 | EA | _____ | _____ |
| 8. | Furnish & Install Skyline Honeylocust | 4 | EA | _____ | _____ |
| 9. | Furnish & Install Kentucky Coffee Tree | 10 | EA | _____ | _____ |
| 10. | Furnish & Install Exclamation London Plane Tree | 1 | EA | _____ | _____ |
| 11. | Furnish & Install Red Oak | 1 | EA | _____ | _____ |
| 12. | Furnish & Install Bald Cypress | 3 | EA | _____ | _____ |

| Item | Description | Approx. Quantity | Unit | Unit Price | Subtotal |
|---|---|---|---|---|---|
| 13. | Furnish & Install Redmond American Linden | 1 | EA | _____ | _____ |
| 14. | Furnish & Install Silky Dogwood (Live Stake) | 265 | EA | _____ | _____ |
| 15. | Furnish & Install Red Twig Dogwood (Live Stake) | 183 | EA | _____ | _____ |
| 16. | Furnish & Install Artic Fire Red Twig Dogwood | 5 | EA | _____ | _____ |
| 17. | Furnish & Install Kalm St. Johnswort | 9 | EA | _____ | _____ |
| 18. | Furnish & Install Double Knock Out Rose | 10 | EA | _____ | _____ |
| 19. | Furnish & Install Emerald Green Arborvitae | 10 | EA | _____ | _____ |
| 20. | Furnish & Install Karl Foerster Reed Grass | 24 | EA | _____ | _____ |
| 21. | Furnish & Install Big Blue Lilyturf | 177 | EA | _____ | _____ |
| 22. | Furnish & Install Marshall's Delight Bee Balm | 37 | EA | _____ | _____ |
| 23. | Furnish & Install Hameln Dwarf Fountain Grass | 24 | EA | _____ | _____ |
| 24. | Furnish & Install Prairie Dropseed | 67 | EA | _____ | _____ |
| 25. | Furnish & Install Bitternut Hickory (Bare Root Tree Whip) | 232 | EA | _____ | _____ |
| 26. | Furnish & Install Shagbark Hickory (Bare Root Tree Whip) | 232 | EA | _____ | _____ |

| Item | Description | Approx. Quantity | Unit | Unit Price | Subtotal |
|---|---|---|---|---|---|
| 27. | Furnish & Install American Hophornbeam (Bare Root Tree Whip) | 232 | EA | _____ | _____ |
| 28. | Furnish & Install Black Cherry (Bare Root Tree Whip) | 232 | EA | _____ | _____ |
| 29. | Furnish & Install Bur Oak (Bare Root Tree Whip) | 232 | EA | _____ | _____ |
| 30. | Furnish & Install Legend Elite Sport ProNitro Plus Grass Seed with Blanket (SEED) (Allowance) | 250,000 | SF | _____ | _____ |
| 31. | Furnish & Install Midwest Mesic Pollinator Seed Mix with Blanket (PRA1) | 5,300 | SF | _____ | _____ |
| 32. | Furnish & Install Swale Seed Mix with Blanket (PRA2) | 31,300 | SF | _____ | _____ |
| 33. | Furnish & Install Low Profile Prairie Seed Mix with Blanket (PRA3) | 2,000 | SF | _____ | _____ |
| 34. | Furnish & Install No Mow Fescue Seed Mix with Blanket (PRA4) | 12,700 | SF | _____ | _____ |
| 35. | Furnish & Install Upland Transition Zone Seed Mix with Blanket (PRA5) | 26,500 | SF | _____ | _____ |
| 36. | Furnish & Install Wetland Zone A Seed Mix with Blanket (PRA6) | 125,000 | SF | _____ | _____ |
| 37. | Furnish & Install Wetland Zone B Seed Mix with Blanket (PRA7) | 11,000 | SF | _____ | _____ |

| Item | Description | Approx. Quantity | Unit | Unit Price | Subtotal |
|---|---|---|---|---|---|
| 38. | Furnish & Install Wetland Zone C Seed Mix with Blanket (PRA8) | 12,500 | SF | _____ | _____ |
| 39. | Furnish & Install Custom Forest Seed Mix with Blanket (PRA9) | 2,800 | SF | _____ | _____ |
| 40. | Spread Bio-Solids Provided By Park District | 1 | LS | _____ | _____ |
| **R.** | **GENERAL CONSTRUCTION** | | | | |
| 1. | Unsuitable Soil Conditions Removal & Install 3" Rock (Allowance to be Credit Back to Owner Any Unused Portion) | 150 | CY | _____ | _____ |
| 2. | Owner Project Allowance (Allowance to be Credit Back to Owner Any Unused Portion) | 1 | LS | $75,000 | $75,000 |
| 3. | Preparation of SWPPP manual & all site inspections per MWRD permit requirements | 1 | LS | _____ | _____ |
| 4. | Preparation of All Documents For MWRD RFI permit closeout including As-Built Construction Plans & Volume Calculations | 1 | LS | _____ | _____ |
| 5. | Preparation of Topo Survey After Construction | 1 | LS | _____ | _____ |

**ATHENS PARK – BASE BID** $_____

## ALTERNATES

| Item | Description | Approx. Quantity | Unit | Unit Price | Subtotal |
|---|---|---|---|---|---|
| **S.** | **ADD ALTERNATE 1- CONCRETE BOARDWALK PLATFORM** | | | | |
| 1. | Type 201 5" Concrete | 110 | SF | _____ | _____ |
| 2. | Concrete Curb | 125 | LF | _____ | _____ |
| 3. | Type 205 EWF Wood Loose Fill Safety Surface With Filter Fabric | 130 | CY | _____ | _____ |
| 4. | Furnish & Install Concrete Boardwalk Platform (See Architectural & Structural Plans) | 1 | LS | _____ | _____ |

**TOTAL FOR ADD ALTERNATE 1 - CONCRETE BOARDWALK PLATFORM** **$**_____

**T. ADD ALTERNATE 2A- VERTICAL PIERS AT ENTRY MONUMENT**

1. Provide 2 vertical piers at entry monument as indicated on Architectural & Structural drawings.

**TOTAL FOR ADD ALTERNATE 2A - VERTICAL PIERS AT ENTRY MONUMENT** **$**_____

**U. ADD ALTERNATE 2B- CENTRAL VERTCIAL PIER & SPANNING STEEL ARCH**

1. Provide center vertical pier and spanning steel arch at park entrance.

**TOTAL FOR ADD ALTERNATE 2B - CENTRAL VERTCIAL PIER & SPANNING STEEL ARCH** **$**_____

**V. ADD ALTERNATE 3- PRODUCT REMOVAL WELLS**

1. Provide product removal wells and pumphouse as indicated on drawings.

**TOTAL FOR ADD ALTERNATE 3- PRODUCT REMOVAL WELLS** **$**_____

| Item | Description | Approx. Quantity | Unit | Unit Price | Subtotal |
|---|---|---|---|---|---|
| **W.** | **ADD ALTERNATE 4- EAST SHELTER CONSTRUCTION** | | | | |
| 1. | Type 201 5" Concrete Paving | 1,575 | SF | _____ | _____ |
| 2. | Type B Concrete Shelter Footings | 4 | EA | _____ | _____ |
| 3. | Install Only 20' x 34' Metal Park Shelter with Tongue & Groove Ceiling | 1 | EA | _____ | _____ |
| 4. | Masonry Stone Veneer Columns with Pre-Cast Cap | 4 | EA | _____ | _____ |
| 5. | Install Only Standard 4 Seat Picnic Table Surface Mount | 5 | EA | _____ | _____ |
| 6. | Install Only ADA 3 Seat Picnic Table Surface Mount | 1 | EA | _____ | _____ |
| 7. | Install Only Litter Can Surface Mount | 1 | EA | _____ | _____ |
| 8. | Install Only Swivel Grill In-Ground | 2 | EA | _____ | _____ |
| 9. | Electrical Work (See Electrical Plans) | 1 | LS | _____ | _____ |
| **TOTAL FOR ADD ALTERNATE 4 – EAST SHELTER CONSTRUCTION** | | | | **$**_____ | |
| **X.** | **ADD ALTERNATE 5- PLAYGROUND FENCING** | | | | |
| 1. | Furnish & Install 4' High Montage PPP Ornamental Fence (Ameristar) | 400 | LF | _____ | _____ |

## BID RECAPITULATION:

**ATHENS PARK – BASE BID** $_____

**ADD ALTERNATE 1 - CONCRETE BOARDWALK PLATFORM** $_____

**ADD ALTERNATE 2A - VERTICAL PIERS AT ENTRY MONUMENT** $_____

**ADD ALTERNATE 2B- CENTRAL VERTCIAL PIER & SPANNING STEEL ARCH** $_____

**ADD ALTERNATE 3- PRODUCT REMOVAL WELLS** $_____

**ADD ALTERNATE 4- EAST SHELTER CONSTRUCTION** $_____

**ADD ALTERNATE 5- PLAYGROUND FENCING** $_____

**ATHENS PARK – BASE BID WITH ALTERNATE PACKAGES 1, 2A, 2B, 3, 4 & 5** $_____

**BID PARAMETERS: Please check each box to acknowledge understanding and compliance of said parameters.**

- ☐ The bidder hereby agrees to provide all labor, materials, tools, staking and equipment required to complete project construction in conformance with the terms of the Contract Documents.

- ☐ The bidder has included the construction schedule for this project as required by these bid documents.

- ☐ The Bidder understands that a properly certified check, bank draft, cashier's check or bid bond payable to the Lemont Park District for not less than ten (10%) percent of the total bid amount will be required for each bid.

Form of Bid Security _____, in the amount of $_____ is enclosed.

**CONTRACT WILL BE AWARDED TO THE LOWEST RESPONSIBLE TOTAL BASE BID AMOUNT WITH ANY ACCEPTED ALTERNATE PACKAGE AND/OR SPECIFIC ITEMS WITHIN THE BID.**

SIGNATURE: _____

TITLE:_____

1. Firm Name:
2. Address (Street):
   (City, state, zip):
3. Phone:
4. Date:

**AFFIDAVIT OF EXPERIENCE** (*This Affidavit must be executed*)

**STATE OF _____)**
**}SS:**
**COUNTY OF _____)**

_____, being duly sworn, says that he/she is

_____of _____

(sole owner, member of firm, corporate official) (individual, firm, corporate name)

which has done work for the following parties of or the general kind and approximate magnitude required under this Contract: (*List project name, contact, phone number and date of completion below)*

| Project Name | Contact | Phone # | Completion Date |
|---|---|---|---|
| | | | |
| | | | |
| | | | |

and that _____ owns or has available for immediate use on
(He/she, said firm, said corporation)

the proposed work the following equipment:

_____and that

_____ will be assigned to work under this Contract, and
(Name of superintendent)

that his experience in this kind of work as shown above:

_____
*(Bidder Signature)*

Subscribed and Sworn to
before me this ____ day
of _____, 2023.

My Commission Expires: _____

_____ [SEAL]
Notary Public

**LEMONT PARK DISTRICT**
**ATHENS PARK DEVELOPMENT**

## CONTRACTOR'S CERTIFICATION

In Compliance with P.A. 85-1295 – Illinois Revised Statute, Chapter 38, Section 33E-11

_____ a _____
Print name of Contractor Individual, Partnership, Corporation

As part of his bid on the above-sole referenced Contract, hereby certifies that the Contractor is not barred from quoting on the above referenced contract as a result of a violation of either Section 33E-3 Bid-rigging or 33E-4 Bid-stating of Article 33E of the Illinois Criminal Code of 1961, as amended.

_____
Date

Contractor

By:_____

Title:_____

STATE OF ILLINOIS )

SS

COUNTY OF _____ )

I, the undersigned, a notary public in and for the State and County aforesaid, hereby certify that

_____ appeared before me this day in person and, being first duly sworn on oath, acknowledged that he/she executed the foregoing certification as his/her free act and deed.

Dated:_____ Notary Public:_____

## LIST OF SUBCONTRACTORS & SUPPLIERS

The sub-contractors and suppliers listed below will be involved in this contract work in the assignments listed. We understand that any deviation from this list must be requested and approved in writing ten days before the start of the work that is involved.

Failure to complete this list will result in reject of bid.

Legal name, current telephone number and address of all subcontractors must be included.

| Sub-Contractors | Work Assignment |
|---|---|
| | |
| | |
| | |
| | |
| | |
| | |

| Suppliers | Material |
|---|---|
| | |
| | |
| | |
| | |
| | |

# CONTRACTOR BID AGREEMENT

TO: Lemont Park District
16028 127th Street
Lemont, Illinois 60439

The undersigned Contractor, in compliance with your advertisement for bids for work as specified, and related documents prepared by or at the direction of the Lemont Park District, Owner, and having examined the site and being familiar with all conditions surrounding the Work, including availability of labor and material, does hereby propose to furnish materials, labor, equipment and services and pay for same and shall perform all Work required for the completion of the Project, in accordance with the contract documents and at the prices stated below.

**The undersigned Contractor understands that prevailing wages must be paid in connection with the Work and agrees to maintain and provide to Owner upon its request, required documentation to support compliance with the Illinois Prevailing Wage Act, in accordance with the law.**

Contractor certifies this bid to be for the project described below and to be in accordance with plans, specifications and contract documents, including the invitation for bid.

In no event shall any delays or extensions of time be construed as cause or justification for payment of extra compensation to the Contractor. Any claims for an increase of the contract time shall be made in writing to the Park District within seven (7) days of the cause.

Signed: _____

Title: _____

Date: _____

## CERTIFICATION OF ILLINOIS PREFERENCE ACT REQUIREMENTS

I, _____, Contractor, hereby certifies that it will use at least 90% Illinois laborers on all public works projects that receive State funds or funds administered by the State during a period of excessive unemployment. Excessive unemployment is defined as any month immediately following two (2) consecutive calendar months that the Illinois unemployment rate exceeds 5%. Contractor shall protect, defend, indemnify and hold the Owner harmless for any claims or demands made as a result of Contractor's failure to comply with this certification.

Certified By: _____ Dated: _____
(Contractor's Authorized Representative)

_____
(Name of Contractor's Representative)

_____
(Title of Representative)

_____
(Name of Contractor)

Address of Contractor:

_____

_____

I, the undersigned, a notary public in and for the State and County aforesaid, hereby certify that

_____ appeared before me this day in person and, being first duly sworn on oath, acknowledged that he/she executed the foregoing certification as his/her free act and deed.

Dated:_____ Notary Public:_____

# NON-COLLUSION AFFIDAVIT

"I (we) hereby certify and affirm that my (our) proposal was prepared independently for this project and that it contains no fees or amounts other than for the legitimate execution of this work as specified and that it includes no understanding or agreements in restraint of trade."

1. Corporation

The officers of the corporation are as follows:

TITLE NAME ADDRESS

President _____

Vice President_____

Secretary _____

Treasurer _____

2. Partnership

The general partners of the partnership are as follows:

NAME ADDRESS

_____

_____

_____

3. Individual

NAME ADDRESS

_____

4. Joint Venture

The signatories to the aforesaid Joint Venture Agreement are as follows:

NAME (and ENTITY TYPE) ADDRESS

_____(___)_____

_____(___)_____

_____(___)_____

[For each signatory, indicate type of entity (Corporation = "C"; Partnership = "P"; and Individual = "I")

DATED this _____ day of _____, 2023.

_____
Bidder

Attest/Witness:

By: _____

Title: _____

Subscribed and Sworn to before me this ____ day of _____, 2023.

My Commission Expires: _____

_____ [SEAL]
Notary Public

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

CERTIFICATE OF COMPLIANCE WITH
ILLINOIS DRUG-FREE WORKPLACE ACT

_____, 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 _____, 2023.

My Commission Expires: _____

_____
Notary Public

[SEAL]

**CERTIFICATE REGARDING NON-DISCRIMINATION IN EMPLOYMENT – PROTECTED CATEGORIES**

CERTIFICATE REGARDING
NON-DISCRIMINATION IN EMPLOYMENT – PROTECTED CATEGORIES

_____ [Contractor], does hereby certify that [he, she, it] has a written policy that includes, at a minimum, the following information: (i) the definition of persons in a Protected Category in Employment under State and Federal law; (ii) the illegality of discrimination against persons in a Protected Category in Employment; (iii) an internal complaint process including penalties; (iv) the legal recourse, investigative and complaint process available through both the Illinois Department of Human Rights and Human Rights Commission and the U.S. Equal Employment Opportunity Commission; (v) directions on how to contact the Illinois Department of Human Rights and Human Rights Commission and the U.S. Equal Employment Opportunity Commission; and (vi) protection against retaliation.

Discrimination against Persons in a Protected Category in Employment can occur in the following categories: Age, Disability, Equal Pay/Compensation, Genetic Information, Harassment, National Origin, Pregnancy, Race/Color, Religion, and Sex-Based Discrimination.

_____
By Authorized Agent

_____
Date

Subscribed and Sworn to
before me this ____ day
of _____, 2023.

My Commission Expires: _____

_____
Notary Public

[SEAL]

# CERTIFICATE REGARDING SEXUAL HARASSMENT POLICY

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: (i) the illegality of sexual harassment; (ii) the definition of sexual harassment under State law; (iii) a description of sexual harassment, utilizing examples; (iv) an internal complaint process including penalties; (v) the legal recourse, investigative and complaint process available through the Department of Human Rights and Human Rights Commission; (vi) directions on how to contact the Department of Human Rights and Human Rights Commission; and (vii) protection against retaliation.

_____
By Authorized Agent

_____
Date

Subscribed and Sworn to
before me this ____ day
of _____, 2023.

My Commission Expires: _____

_____
Notary Public

[SEAL]

# GENERAL CONDITIONS

## 1.1 DEFINITION OF TERMS

A. Owner: Lemont Park District, or authorized personnel representing the interest of the District.

B. Contractor/Vendor: The individual, firm or corporation undertaking the execution of the work under the terms of the Contract and acting directly or through a duly authorized representative.

C. Plans: All official drawings or reproductions of drawings pertaining to the work provided for in the Contract as prepared by the Owner or his agent.

D. Construction Observer: The authorized representative of the Owner assigned to make construction observation of the work or materials thereof.

E. Contractor: Any individual, firm or corporation submitting a proposal for the work contemplated, acting directly or through a duly authorized representative.

F. Corporation: With respect to the execution and performance of the Contract, a corporate body authorized or licensed to do business in the state in which the site is located.

G. Specification: The body of directions, conditions and requirements contained in the Contract, together with written agreements and all documents of any description made or to be made pertaining to the method or manner of performing the work, the quantities, or the quality of materials to be furnished under the Contract.

H. Proposal: The offer to perform the work proposed, presented upon the proposal form prepared by the Owner.

I. Contract: The written Agreement covering the performance of the work and the furnishing of any related materials for the construction of the project.

J. Performance Bond: The form of security approved by the Owner and furnished by the Contractor for his Surety as a guarantee of good faith and ability on the part of the Contractor to execute the work in accordance with the terms of the Contract.

L. Award: The decision of the Owner to accept the Proposal of a responsible Contractor for the work, subject to the execution and approval of the Contract and Contract Bond to secure the performance thereof, and to such other conditions as may be specified or otherwise required by law.

M. Or Equal: When used on the drawings or in the specifications in reference to a material, product or procedure shall mean a substitute meeting the exact specification of those items so stated; and must be approved by the Owner before bids are submitted.

N. Special Conditions: Special conditions, when included in these contract documents, shall act to supplement these General Conditions, the attached specifications and the plans on particular portions of the project. They shall govern the contract documents whenever they conflict therewith, but shall not operate to annul those portions of the Specifications with which they are not in conflict.

1.2 OWNERSHIP OF PLANS AND SPECIFICATIONS:

A. All Plans and Specifications and copies thereof, furnished by the Owner, are his property. They are not to be used on other work, and with the exception of one complete set, are to be returned to him on request at the completion of the Contract work. No deposit for plans will be required.

B. The Plans, Specifications, Special Conditions and Proposal Form are intended to include all job items necessary to properly complete the work. If, through inadvertence or otherwise, the Plans or Specifications omit to require any work necessary for such completion, the Contractor shall, nevertheless, be required to perform such work. Plans and Specifications are intended to be consistent with one another and with other portions of the Contract. Work or materials called for by the Plans and not mentioned in the Specifications, or vice-versa, shall be performed in as faithful and thorough manner as though fully covered by both.

1.3 PROPOSAL FORM

A. The Proposal Form will be furnished stating the items of work contemplated.

B. The Proposal Form states the date, time and place of filing and opening of Proposals.

1.4 PERFORMANCE BOND

A. The successful Contractor at the time of the execution of the Contract shall deposit with the Owner a Performance Bond for the full amount of the contract, guaranteeing the faithful performance of the work in accordance with the Contract, the payment of all indebtedness incurred for labor and materials, and guarantee correction of work for a period of one (1) year after final payment.

B. Failure on the part of the successful Contractor to execute a Contract and deposit an acceptable Performance Bond within ten (10) days from the date of notice of the award of Contract will be considered just cause for the annulment of the Award and the forfeiture of the Proposed Guarantee to the Owner.

1.5 LAWS AND PERMITS

The Contractor shall at all times observe and comply with all federal, state and local laws, regulations and ordinances which in any manner affect the conduct of the work. Any complaint, claim or action brought against the Contractor for failure to observe or comply with any law, ordinance or regulation shall be the sole responsibility of the Contractor and shall in no way extend to or expose the Owner to liability, and the Contractor shall indemnify and hold harmless the Owner from any and all such complaints, claims or actions. Before beginning work, the Contractor shall obtain from the proper officials all necessary permits and licenses, pay all charges and fees, and give all notices necessary and incident to the due and lawful prosecution of the work.

1.6 COMPETENCY

The Contractor shall, when requested by the Owner, furnish signed statements evidencing his responsibilities and showing financial ability, experience, amount and condition of equipment and the value of all uncompleted work under contract pertaining to the proper execution of the specified work.

1.7 DECISION OF THE OWNER

All work done under this Contract shall be done to the satisfaction of the Owner. The Owner shall in all cases determine the amount of work done which is to be paid for under this Contract. The Owner shall decide all questions that may arise as to the measurements of quantities and the fulfillment of this Contract on the part of the Contractor, and shall determine all questions concerning the true intent or meaning of the Plans and Specifications and his determination and decision shall be final and conclusive.

1.8 USE OF SITE

A. The Contractor shall confine his equipment, the storage of materials and the operations of his workmen to the limits indicated by law, ordinances, permits or directions of the Owner and shall not unreasonably encumber the site with his materials.

B. The Contractor shall enforce the Owner's instructions regarding the conduct and use of the site by his employees.

1.9 SUPERINTENDENTS

The Contractor shall keep a competent superintendent on the job at all times who shall have the knowledge and control of all work under this Contract and shall communicate directly to the Owner upon request and be able to communicate in English.

1.10 HOLD HARMLESS AND INDEMNIFICATION

The Contractor shall assume all liability for, and shall protect, defend, indemnify and hold harmless the Owner, their officers, employees, servants, consultants and agents, from and against all claims, actions, suits, judgments, costs, losses, expenses and liabilities of whatsoever kind or nature arising out of:

A. Any infringement (actual or claimed) on any patents, copyrights or trade names by reason of any work performed or to be performed by the Contractor under this Contract or by reason of anything to be supplied by the Contractor pursuant to this Contract.

B. Bodily injury, including death, to any person or persons (including Contractor's officers, employees, agents, consultants and servants) or damage to or destruction of any property, including the loss of use thereof:

1. Caused in whole or in part by any act, error or omission by the Contractor or any sub-contractor or anyone directly or indirectly employed by any of them regardless of whether or not it is caused in part by a party to be indemnified hereunder:

2. Arising directly or indirectly out of the presence of any person in or about any part of the project site or in the streets, sidewalks and property adjacent thereto;

3. Arising directly or indirectly out of the use, misuse or failure of any machinery or equipment used directly or indirectly in the performance of this Contract.

1.11 CHANGES OR ALTERATIONS OF CONTRACT WORK

A. The Owner reserves the right to alter the Plans by adding to or deducting from the original quantities as bid without invalidating the Contract. All such work shall be executed under the original conditions for the original contract, except for an extension in time caused by any such changes or alterations.

B. All changes or alterations shall be made ONLY when ordered in writing from the Owner showing any claims for changes in the Contract amount.

C. The value of any change shall be determined by one or more of the following methods:

1. By an approved Lump Sum;

2. By Unit Prices given in the Contract or subsequently agreed upon;

3. Time and material plus percentage. This method of cost shall be used on the Contractor's actual costs for time and material plus 20% for Contractor's overhead and profit. Contractor's actual costs shall be the direct costs for labor, payroll taxes, materials and equipment.

1.12 EXTRA WORK

The Contractor, as requested, shall perform EXTRA WORK as directed by the Owner. Written orders and claims for payment shall be the same as those stated above in Section C.

1.13 LIENS

If at any time during the progress of said work the Contractor shall fail or neglect to pay for any labor performed, material furnished or tools, machinery, appliances, fuel, provisions or supplies of any sort or kind, used or consumed in, upon, on account of said work, for ten (10) days after payment for same shall become due, then the Owner shall have the power to pay for such labor, or for materials, and the amount so paid shall be retained out of money due, or becoming due to the Contractor. The Owner may refuse to make payment to said Contractor of monies due him to the extent of such indebtedness, and until satisfactory evidence in writing has been furnished that said indebtedness has been discharged.

1.14 DISCHARGE OF EMPLOYEES

If any person employed by the Contractor on the work shall appear to the Owner to be incompetent or conduct himself in a disorderly or improper manner, such person shall be removed from the work immediately on the request of the Owner.

1.15 ABANDONMENT

Should the Contractor abandon or neglect the work, or if the Owner at any time is convinced that the work is unreasonably delayed or that the Conditions of the Contract are being willfully violated, executed carelessly, or in bad faith, he may notify the Contractor in writing, and if this notification be without effect within twenty-four (24) hours after the delivery thereof, then, and in that case, the Contractor shall discontinue all work under the Contract and the Owner shall have full authority to make arrangements for the completion of the Contract at the expense of the Contractor.

1.16 PROTECTION OF PROPERTY - SAFETY RESPONSIBILITY

The Contractor shall protect all existing property and improvements within this Site and those adjacent to the Owner's property. He shall be responsible for the repair costs of any damage created by his operations or those of his sub-contractors.

1.17 CLEANING UP

The Contractor shall at all times keep the Site free from accumulation of waste material or rubbish caused by his employees or work, and at the completion of the work, he shall remove all his rubbish, tools, and surplus materials from the site, leaving the area in a neat and professional workmanlike condition. In case of dispute, the Owner may remove the rubbish and charge and cost to the Contractor.

1.18 PAYMENT

The Contractor may request partial payments, based on estimates of work, during the third week of each month. The estimate shall be a sworn statement of the work completed to date. Payment requests should be submitted directly to Design

Perspectives, Inc. in triplicate and in turn will be submitted to the Park Board for payment during their regularly scheduled meetings the fourth week of each month. Estimates for partial payment request shall be as follows:

A. Lump Sum: When the Contract work has been awarded on Lump Sum Bid basis, the form of each estimate will include the Contractor's breakdown of job items with a total value given each item. The estimate for the items of work completed to date shall be expressed as a percentage of the total with the corresponding cost for each item shown and totaled to show the total cost of work, the work completed to date, less ten (10%) percent to be withheld, giving the amount requested for payment. Previous requests for payment, paid by the Owner, shall be shown on each subsequent request and subtracted after the ten (10%) percent has been withheld.

B. Percent Withheld: Each request for payment shall be approved by the Owner only after ten (10%) percent has been retained as stated above.

C. Waivers of Lien & Certified Payroll: Failure to supply certified payroll and waivers of lien or acceptable evidence of payment of all current accounts incurred by this Contract work will be considered grounds for withholding payment.

D. Final Payment: Upon satisfactory completion of the improvements provided for by the Contract in Section - 01770 Close-Out Procedures and final approval and acceptance by the Owner, the Contractor shall submit a final request for payment, including the ten (10%) percent withheld, to be paid by the Owner within ninety (90) days after receipt of payment request.

1.19 CORRECTION OF WORK AFTER FINAL PAYMENT

The final payment of any provision in the Contract documents shall not relieve the Contractor of the responsibility for the correction of any and all defects in the work performed. He shall correct all defects as notified for a period of one year after final payment and two years after final payment for all concrete work.

1.20 RESPONSIBILITY

The Owner recognizes that the Contractor is an expert in the manner in which the work under this Contract is to be performed. The Owner agrees that the responsibility for the maintenance of safe equipment and the using of proper construction methods and procedures shall rest solely with the Contractor and sub-contractors performing the work, and that the Owner shall not have any responsibility therefor. The Owner does have the right to ascertain and require that the work product of the Contractor and his sub-contractors complies with the Contract.

1.21 CONTRACTOR RESPONSIBILITY TO OWNER

The successful contractor shall notify the Owner three (3) days in advance of all grading, drainage, and other major items of construction for field checking of construction engineering. All questions pertaining to the Plans, Specifications and details of the work

shall be directed to the Owner and cleared prior to construction.

1.22 COMPLETION DATE

It is hereby understood and mutually agreed by and between the Contractor and the Owner that the date of beginning and the time for completion as specified in the Contract is a reasonable time for the completion of the work, taking into consideration the average weather and industrial conditions prevailing in this locality. If the Contractor shall neglect, fail or refuse to complete the work within the time specified in the contract or any proper extension thereof granted by the Owner, it in no way relieves the Contractor of his responsibility to complete the work at no additional cost to the Owner. Should it be necessary to extend the completion date in order for the Contractor to complete the work, the Owner and the Contractor shall come upon a written agreement to extend the completion date, provided the Contractor shall not be responsible for failure to meet the completion date when the Owner determines that the Contractor is without fault and the Contractor's reasons for the time extension are acceptable to the Owner. The Contractor shall not be charged with any excess cost when the delay in completion of work is due to:

A. Any order duly issued by the government (city, county, state or federal):

B. Any unforeseeable cause beyond the control and without fault or negligence of the Contractor including, but not restricted to, Acts of God, severe weather, strikes, acts of the Owner, acts of another Contractor in the performance of a Contract with the Owner, and;

C. Any delays of sub-contractors or suppliers occasioned by any of the causes specified in subsections A and B. The Contractor shall notify the Owner within five (5) days prior to any such delay, when reasonably possible.

1.23 TEMPORARY WORK

It shall be the responsibility of the Contractor to make all arrangements to obtain permits, provide and make payment for such utilities as water, electricity, heat/air and telephone when necessary when performing work tasks as required by the Contract. The work shall consist of all tools, materials and labor necessary to complete the work as specified on the drawings. The Contractor shall be responsible for complying with all municipal codes and for inspections to certify compliance with all codes.

1.24 CONSTRUCTION AIDS

A. Pumping: If, during construction, standing water caused by heavy rains or poor drainage becomes a hazard in the proper execution of the Contract, it shall be the responsibility of the Contractor to provide and make payment for removal of said water to existing drainage swales, storm sewers or other natural or man-made drainage ways.

B. Ladders and Hoists: It shall be the responsibility of the Contractor to provide ladders and hoists when necessary in performing work tasks as required by the Contract.

C. Temporary Roads: It shall be the responsibility of the Contractor to provide and make payment for any necessary temporary roads for access to and within the site during the execution of the Contract.

1.25 PROTECTION

A. Public and Adjacent Property: The Contractor shall under all circumstances be responsible for the preservation of all public and adjacent properties and shall use every precaution necessary to prevent damage or injury thereto.

B. Present Structures: The Contractor shall use suitable precautions to prevent damage to pipes, conduits, and other underground structures as well as fences, monuments or any other above ground structures.

C. Trees and Shrubs: The Contractor shall be responsible for the protection of all trees and shrubs not marked for removal. The Contractor shall provide on-site traffic patterns away from existing trees and shall provide suitable ramps where necessary. Methods for ramps, staking and bark protection must be developed by the Contractor and approved by the Owner.

D. Protection for the Owners, Employees, and General Public: The Contractor shall be responsible for adequately barricading off the construction areas, covering holes, properly storing equipment, and providing other suitable methods for the protection of said persons.

1.26 STORAGE

Materials and equipment shall be so stored as to insure the preservation of their quality and fitness for the work. When considered necessary, they shall be placed on wooden platforms or other hard, clean surfaces, and not on the ground, and/or they shall be placed under cover.

1.27 PARKING

Parking of construction vehicles on the site by the Contractor shall not inhibit construction nor prevent access for emergency or other official vehicles. Parking of private vehicles on the site by the Contractor is prohibited unless said vehicle is necessary in the execution of the Contract. No construction vehicles shall be parked near or under any existing vegetation on the site.

1.28 SUBMITTALS

Contractor must submit all materials and/or products to be used for construction within this contract. Failure to submit and gain written approval could lead to removal of materials and/or products and the installation of acceptable materials and/or products at the expense of the contractor. Submittals need to be received and reviewed and approved at least two (2) weeks prior to start of construction.

## SPECIAL CONDITIONS

LIMIT OF CONSTRUCTION: Construction traffic and staging shall be permitted only within construction limits as directed by Owner. The Contractor is responsible for the repair of any areas disturbed outside of this area, including grading and sodding.

TOPSOIL: Prior to the stripping of topsoil, all areas within the grading limits containing existing debris shall be cleaned to permit easy use of the topsoil. The topsoil shall not contain any sharp objects, such as glass, that will in danger the health, safety and welfare of the user.

LAW COMPLIANCE: All project construction work shall comply with all State and Municipal Laws and Regulation and with all Local Ordinances and Rules pertaining to this work. Such Laws, Regulations, Ordinances and Rules shall be considered a part of these specifications.

All successful Contractors must comply with the provisions of the Illinois Human Rights Act dealing with equal employment opportunities (Section 2-105, 775 ILCS 5/2-105) including equality of employment opportunity and the regulations of the Department of Human Rights of the State of Illinois and also must provide for the adoption and implementation or written Sexual Harassment Policies. The Contract with the successful Contractor will provide for this requirement. The statutory provisions setting forth what such policies shall include as a minimum under the Act are on file with the District and available to the Contractor upon request.

LAYOUT/STAKING: All layout and staking required through completion shall be the responsibility of the Contractor at no additional cost to the Owner. The Contractor shall maintain measuring equipment on the site at all times for the purpose of establishing proper elevations and alignments. The Contractor is required to verify all grades as shown on the plans and request adjustments based on data collected in the field based on OWNER review and approval.

INSURANCE:

General: The Contractor shall not commence work under the Contract until he has obtained all insurance required, and it has been approved by the Owner, nor shall Contractor allow any Subcontractor to commence work or any portion of the work until all insurance required of the Contractor and Subcontractor has been similarly approved by the Owner.

All such insurance shall be purchased only from companies licensed and duly authorized by the Department of Insurance of the State of Illinois to do business in Illinois and to write the types of insurance policies as herein specified. Said companies must have a policy holder's rating of A+ and a financial rating of AAAAA as stated in the latest edition of Best's Insurance Guide.

The insurance coverage must be maintained by the Contractor and the Subcontractor (where applicable) until all work is completed by the Contractor and accepted by the Owner are set forth in this section.

Automobile Liability: Contractor shall obtain at his expense Comprehensive Automobile Liability Insurance providing for bodily injury and death coverage in limits of an amount not less than $1,000,000 per person and $1,000,000 per accident, and property damage coverage in limits of an amount not less than $1,000,000 per accident. The Contractor shall be the named insured and the Lemont Park District, public officials, employees and agents as additional insured.

Employer's Liability: Contractor shall obtain at his expense insurance protecting Contractor from all liabilities that may be imposed under the Workmen's Compensation Act and the Workmen's Occupational Diseases Act of the State of Illinois. In the event any portion of the work is sublet, the Contractor shall require the Subcontractor similarly to provide such insurance for all their employees. The limit of liability afforded under the Employers Liability Policy shall not be less than the Illinois Statutory Limit.

General Liability: Contractor shall obtain at his expense such comprehensive Public Liability and Property Damage insurance as shall protect him from claims for damages for bodily injury, including accidental death, as well as from claims for property damage including loss of use resulting therefrom, which may arise from activities under or incidental to the Contract, both on or off the site, whether such activities by himself, any Subcontractor or anyone directly or indirectly employed by any of the, or as otherwise may be herein specified. This provision shall be construed as requiring to Contractor to purchase and maintain Contractor's Protective Insurance and Contractual Insurance in like amounts.

Public Liability Insurance shall be in an amount not less than $1,000,000.00 on account of any one occurrence, including accidental death. Property damage insurance shall be in an amount not less than $1,000,000.00 for bodily injury per person with an aggregate limit of not less than $2,000,000.00. If, as a result of any one or more occurrences the Owner shall decide that the foregoing property damage insurance aggregate limits have either been exhausted or are threatened to become exhausted, the Contractor shall immediately purchase, at his own expense, such additional property damage insurance as the Owner may direct.

Summary: The required minimum coverage's are summarized as follows:

| | |
|---|---|
| 1. Automobile | $1,000,000 B.I. Per Occurrence<br>$1,000,000 B.I. Per Person<br>$1,000,000 P.D. Per Accident |
| 2. Employer's Liability<br>IL Statutory Limit | $1,000,000 Min. |

| | |
|---|---|
| 3. General Liability | $1,000,000 B.I. Per Occurrence<br>$1,000,000 B.I. Per Person<br>$2,000,000 P.C. Aggregate Limit |

Certificate of Insurance: Within ten (10) calendar days after receipt of the "Written Notice to Proceed", the Contractor shall file with the Owner, a Certificate of Insurance showing complete coverage of all insurance required by this Section signed by the insurance companies or their authorized agents, certifying to the name and address of the party insured, the description of the work covered by such insurance, the insurance policy numbers, the limits of liability of the policies and the dates of their expirations, with a further certification from said insurance companies that their policies will not be modified, amended, changed, cancelled or terminated without thirty (30) business days prior written notice to the Owner. Such certification must be in the form acceptable to the Owner. If any form of umbrella or excess coverage policy is utilized by the Contractor, the Owner reserves the right to require a copy of the entire policy.

LABOR LAW: The Contractor and each and every Subcontractor performing work at the site of the project to which this contract relates shall comply with applicable and provisions of all pertinent Federal, State, and Local Labor Laws.

FINAL CLEANING: Just prior to delivery of the job to the Owner, the Contractor shall perform a final cleaning of the curbs, sidewalks and parking lot and haul away from the job-site all debris created by his work on the building and surrounding area.

TIME SCHEDULE: Work under the Contract shall commence within ten (10) calendar days after given "Written Notice to Proceed" by Owners and shall continue with due diligence until completion.

Each Contractor or Subcontractor shall and does hereby agree that he will start and complete his work so as to cause no delay to the Contractor and that he will complete all work under his contract coincidentally with completion of Contractor's work.

ALTERNATE MATERIALS: The materials specified have been determined to have characteristics appropriate for the purposes of this project. No bid will be accepted which proposes to use a non-approved alternate.

WORKMANSHIP: High quality craftsmanship will be expected in all phases of work. Any elements found unacceptable and not in compliance with the contract documents will be removed and replaced by the Contractor at his expenses until satisfactory results are obtained.

CONSTRUCTION FENCING: The Contractor will provide construction fencing for the duration of construction at the park site. Chain Link Metal Fence shall be used in the playground area.

GUARANTEE OF CONCRETE WORK: As an additional guarantee beyond the one (1) year guarantee of the Performance Bond, the Contractor will be required to extend that guarantee to a total of two (2) years after final acceptance. This will cover structural failures, as well as surface erosion due to spalling caused by frost popping soft aggregates within the concrete and surface erosion due to faulty workmanship. All concrete work not meeting high industry standards will be removed and replaced at no charge to the Owner.

WATER: The Contractor will be responsible for supplying all water and associated materials for any construction activities including hoses, connectors and misc. appurtenances necessary for watering landscape, sod areas and water needed for all remaining construction activities. The Contractor may use domestic water sources, such as hose bibs, etc. if available on-site and approved in writing by the Owner and/or local municipality. Otherwise, arrangements must be made by the Contractor to furnish all water needed for any construction activities at no expense to the Owner.

CONSTRUCTION SCHEDULE: The Lemont Park District views the construction schedule a vital part of the bid submittal. All Bids must have a bi-weekly construction schedule included in the submission.

CONTRACTOR QUALIFICATIONS: The Lemont Park District requires all contractors to demonstrate three successfully completed projects at a minimum of similar size, scope and cost. These projects must be listed on the affidavit of experience.

**END OF SECTION**

## INDEX OF DRAWINGS



**CIVIL DRAWINGS**

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| SHEET NUMBER | SHEET TITLE |
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**ARCHITECTURAL DRAWINGS**

| | |
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| S1.01 | MONUMENT FOUNDATION PLAN & DETAILS |
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| S1.03 | MONUMENT PLANS AND DETAILS |
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# DIVISION 1

# GENERAL REQUIREMENTS

# SECTION 01100 - SUMMARY

## PART 1 - GENERAL

### 1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

### 1.2 WORK COVERED BY CONTRACT DOCUMENTS

A. Project Identification: 2023 Athens Park Development

B. Architect Identification: The Contract Documents, dated September 21, 2023 were prepared for Project for The Lemont Park District by Design Perspectives, Inc. in association with Studio GC and RTM Engineering Consultants.

C. The Work for this project primarily consists of demolition and removals, remediation work, site grading and drainage, concrete flatwork and curbing, asphalt paving, shelter construction, bandshell construction, electrical work, dog park construction, playground installation, safety surface installation, fence installation, site furnishings and landscaping.

### 1.3 CONTRACT

A. Project will be constructed under a general construction contract.

### 1.4 WORK SEQUENCE

A. This Work shall be conducted in a single phase.

1. Work of this phase shall be complete and ready for occupancy by November 1, 2024 from the Notice to Proceed.

### 1.5 USE OF PREMISES

A. General: Contractor shall have full use of premises as shown by limits of construction on plans and outlined in the General Conditions for construction operations, including use of Project site, during the construction period.

## 1.6 PRODUCTS ORDERED IN ADVANCE

A. General: Owner has purchased the playground equipment, park shelters and site furnishings (bench, litter cans, bike rack) and these items will be stored within the Lemont Park District for Contractor pick up for use in this project.

## 1.7 SPECIFICATION FORMATS AND CONVENTIONS

A. Specification Format: The Specifications are organized into Divisions and Sections using the 16-division format and CSI/CSC's "MasterFormat" numbering system or owner developed format reflecting CSI divisions or located on Plan Sheets.

1. Section Identification: The Specifications use section numbers and titles to help cross-referencing in the Contract Documents. Sections in the Project Manual are in numeric sequence; however, the sequence is incomplete. Consult the table of contents at the beginning of the Project Manual to determine numbers and names of sections in the Contract Documents.

B. Specification Content: The Specifications use certain conventions for the style of language and the intended meaning of certain terms, words, and phrases when used in particular situations. These conventions are as follows:

1. Abbreviated Language: Language used in the Specifications and other Contract Documents is abbreviated. Words and meanings shall be interpreted as appropriate. Words implied, but not stated, shall be inferred as the sense requires. Singular words shall be interpreted as plural, and plural words shall be interpreted as singular where applicable as the context of the Contract Documents indicates.
2. Imperative mood and streamlined language are generally used in the Specifications. Requirements expressed in the imperative mood are to be performed by Contractor. Occasionally, the indicative or subjunctive mood may be used in the Section Text for clarity to describe responsibilities that must be fulfilled indirectly by Contractor or by others when so noted.

a. The words "shall," "shall be," or "shall comply with," depending on the context, are implied where a colon (:) is used within a sentence or phrase.

1.8 RESPONSIBILITIES

A. The responsibilities of the Contractor include the following:

1. Furnish all labor, supervision, materials, equipment and services necessary for proper execution of the work.
2. Protect all finished and unfinished work from the public.
3. Equipment, materials and supplies may be stored at each work site at an appropriate location approved by the Project Manager that is considered best for work execution, without jeopardizing safety.
4. A schedule of the project work operations shall be coordinated with the Project Manager to determine starting and estimating completion dates for the purpose of scheduling inspections and to reduce operational affects upon on-going activities.
5. Notify the Project Manager seventy-two hours (72) in advance of initiating construction.
6. Submit to the Project Manager, literature providing manufacturer's technical information regarding materials and products used.
7. Provide a foreman that is fluent in English on site at all times. Provide general supervision of the work and issue instructions to subcontractors in regard to work schedules, assignment of work and storage areas, safety provisions, and coordination.
8. Comply with codes, ordinances, rules and legal requirements of authorities.
9. Secure all applicable permits and licenses.
10. Remove from site all extra excavated material, unless otherwise directed by Owner.
11. Damage to existing improvements, piping, conduit, lawns or structures shall be repaired by the Contractor at his own expense.
12. Abide by the current Illinois Department of Labor Prevailing wages for Cook County.

B. The responsibilities of the Park District:

1. Review layout of the project elements as illustrated in the drawings.
2. Provide playground equipment, park shelter and site furnishings.

PRODUCTS (Not Used)

EXECUTION (Not Used)

END OF SECTION 01100

# SECTION 01250 - CONTRACT MODIFICATION PROCEDURES

## PART 1 - GENERAL

### 1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

### 1.2 SUMMARY

A. This Section specifies administrative and procedural requirements for handling and processing Contract modifications.

B. Related Sections include the following:
   1. Division 1 Section "Unit Prices" for administrative requirements for using unit prices.

### 1.3 MINOR CHANGES IN THE WORK

A. Project Manager will issue supplemental instructions authorizing Minor Changes in the Work, not involving adjustment to the Contract Sum or the Contract Time.

### 1.4 PROPOSAL REQUESTS

A. Owner-Initiated Proposal Requests: Project Manager will issue a detailed description of proposed changes in the Work that may require adjustment to the Contract Sum or the Contract Time. If necessary, the description will include supplemental or revised Drawings and Specifications.

   1. Proposal Requests issued by Project Manager are for information only. Do not consider them instructions either to stop work in progress or to execute the proposed change.
   2. Within five (5) days after receipt of Proposal Request, submit a quotation estimating cost adjustments to the Contract Sum and the Contract Time necessary to execute the change.

      a. Include a list of quantities of products required or eliminated and unit costs, with total amount of purchases and credits to be made. If requested, furnish survey data to substantiate quantities.
      b. Indicate applicable taxes, delivery charges, equipment rental, and amounts of trade discounts.

c. Include an updated Contractor's Construction Schedule that indicates the effect of the change, including, but not limited to, changes in activity duration, start and finish times, and activity relationship. Use available total float before requesting an extension of the Contract Time.

B. Contractor-Initiated Proposals: If latent or unforeseen conditions require modifications to the Contract, Contractor may propose changes by submitting a request for a change to Project Manager.

1. Include a statement outlining reasons for the change and the effect of the change on the Work. Provide a complete description of the proposed change. Indicate the effect of the proposed change on the Contract Sum and the Contract Time.
2. Include a list of quantities of products required or eliminated and unit costs, with total amount of purchases and credits to be made. If requested, furnish survey data to substantiate quantities.
3. Indicate applicable taxes, delivery charges, equipment rental, and amounts of trade discounts.
4. Include an updated Contractor's Construction Schedule that indicates the effect of the change, including, but not limited to, changes in activity duration, start and finish times, and activity relationship. Use available total float before requesting an extension of the Contract Time.

## 1.5 CHANGE ORDER PROCEDURES

A. On Owner's approval of a Proposal Request, Project Manager will issue a Change Order for signatures of Owner and Contractor on forms provided by Owner.

## 1.6 CONSTRUCTION CHANGE DIRECTIVE

A. Construction Work Change Directive: The Project Manager may issue a Construction Work Change Directive which instructs the Contractor to proceed with a change in the Work, for subsequent inclusion in a Change Order.

1. Construction Work Change Directive contains a complete description of change in the Work. It also designates method to be followed to determine change in the Contract Sum or the Contract Time.

B. Documentation: Maintain detailed records on a time and material basis of work required by the Construction Work Change Directive.

1. After completion of change, submit an itemized account and supporting data necessary to substantiate cost and time adjustments to the Contract.

PRODUCTS (Not Used)

EXECUTION (Not Used)

END OF SECTION 01250

# SECTION 01270 - UNIT PRICES

## PART 1 - GENERAL

### 1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

### 1.2 SUMMARY

A. This Section includes administrative and procedural requirements for unit prices.

B. Related Sections include the following:

1. Division 1 Section "Contract Modification Procedures" for procedures for submitting and handling Change Orders.

### 1.3 DEFINITIONS

A. Unit price is an amount proposed by bidders, stated on the Bid Form, as a price per unit of measurement for materials or services added to or deducted from the Contract Sum by appropriate modification, if estimated quantities of Work required by the Contract Documents are increased or decreased.

### 1.4 PROCEDURES

A. Unit prices include all necessary material, plus cost for delivery, installation, insurance, applicable taxes, overhead, and profit.

B. Measurement and Payment: Refer to Division 0 and/or individual Specification Sections for work that requires establishment of unit prices. Methods of measurement and payment for unit prices are specified in those Sections.

C. Owner reserves the right to reject Contractor's measurement of work-in-place that involves use of established unit prices and to have this work measured, at Owner's expense, by an independent surveyor acceptable to Contractor.

D. List of Unit Prices: A list of unit prices is included in the Bid Proposal Form. Specification Sections should be referenced in preparing unit prices which contain requirements for materials described under each unit price.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 LIST OF UNIT PRICES

A. Unit Price Schedule: See Bid Proposal Form

END OF SECTION 01270

# SECTION 01290 - PAYMENT PROCEDURES

## PART 1 - GENERAL

### 1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

### 1.2 SUMMARY

A. This Section specifies administrative and procedural requirements necessary to prepare and process Applications for Payment.

B. Related Sections include the following:

1. Division 1 Section "Unit Prices" for administrative requirements governing use of unit prices.
2. Division 1 Section "Contract Modification Procedures" for administrative procedures for handling changes to the Contract.
3. Division 1 Section "Construction Progress Documentation" for administrative requirements governing preparation and submittal of Contractor's Construction Schedule and Submittals Schedule.

### 1.3 DEFINITIONS

A. Schedule of Values: A statement furnished by Contractor allocating portions of the Contract Sum to various portions of the Work and used as the basis for reviewing Contractor's Applications for Payment.

### 1.4 APPLICATIONS FOR PAYMENT

A. Each Application for Payment shall be consistent with previous applications and payments as certified by the Project Manager and paid for by Owner.

B. Payment Application Times: The date for each progress payment is the 21st day of each month. The period covered by each Application for Payment starts on the day following the end of the preceding period and ends thirty (30) days before the date for each progress payment.

C. Payment Application Forms: Use AIA Document G702 and AIA Document G703 Continuation Sheets and Sworn Statement for Contractor and Subcontractor to Owner as form for Applications for Payment.

D. Application Preparation: Complete every entry on form. Notarize and execute by a person authorized to sign legal documents on behalf of Contractor. Project Manager will return incomplete applications without action.

1. Entries shall match data on the Schedule of Values and Contractor's Construction Schedule. Use updated schedules if revisions were made.
2. Include amounts of Change Orders and Construction Change Directives issued before last day of construction period covered by application.

E. Transmittal: Submit three (3) signed and notarized original copies of each Application for Payment to the Project Manager by a method ensuring receipt within two (2) business days. One copy shall include waivers of lien and similar attachments if required.

1. Transmit each copy with a transmittal form listing attachments and recording appropriate information about application.

F. Waivers of Mechanic's Lien: With each Application for Payment, submit waivers of mechanic's liens from subcontractors, sub-subcontractors, and suppliers for construction period covered by the previous application.

1. Submit partial waivers on each item for amount requested, before deduction for retainage, on each item.
2. When an application shows completion of an item, submit final or full waivers.
3. Owner reserves the right to designate which entities involved in the Work must submit waivers.
4. Waiver Delays: Submit each Application for Payment with Contractor's waiver of mechanic's lien for construction period covered by the application.

    a. Submit final Application for Payment with or preceded by final waivers from every entity involved with performance of the Work covered by the application who is lawfully entitled to a lien.

5. Waiver Forms: Submit waivers of lien on forms, executed in a manner acceptable to Owner.

G. Application for Payment at Substantial Completion: After issuing the Certificate of Substantial Completion, submit an Application for Payment showing 100 percent completion for portion of the Work claimed as substantially complete.

1. Include documentation supporting claim that the Work is substantially complete and a statement showing an accounting of changes to the Contract Sum.

2. This application shall reflect Certificates of Partial Substantial Completion issued previously for Owner occupancy of designated portions of the Work.

H. Final Payment Application: Submit final Application for Payment with releases and supporting documentation not previously submitted and accepted, including, but not limited, to the following:

1. Evidence of completion of Project closeout requirements.
2. Insurance certificates for products and completed operations where required and proof that taxes, fees, and similar obligations were paid.
3. Updated final statement, accounting for final changes to the Contract Sum.
4. Contractor's Affidavit of Release of Final Liens.
5. Evidence that claims have been settled.
6. Final liquidated damages settlement statement (If applicable).

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 01290

# SECTION 01320 - CONSTRUCTION PROGRESS DOCUMENTATION

## 1.1 SUMMARY

A. Contractor's Construction Schedule.

B. Field condition reports.

C. Special reports.

D. Construction photographs.

## 1.2 CONTRACTOR'S CONSTRUCTION SCHEDULE

A. Activity Duration: 15 days.

B. Constraints:

1. Phasing.
2. Work by Owner.
3. Products ordered in advance.
4. Owner-furnished products.
5. Work restrictions.
6. Work stages.
7. Area separations.
8. Other Constraints.

C. Milestones: Notice to Proceed, Mass Grading, Concrete Work, Asphalt Work, Shelter Area, Playground Installation, Fine Grading, Landscaping, Substantial Completion, and Final Completion.

D. Software: Contractor's option.

E. Schedule Type: Contractor's option.

F. Updating: At 30-day intervals, issued every month.

## 1.3 REPORTS

A. Field Condition Reports: The contractor shall maintain a written report for each week of work outlining the construction work completed, work to be completed next and any delays or issues affecting the project. The contractor is to submit this report at the request of the Project Manager and/or Owner.

B. Special Reports: When an event of an unusual and significant nature occurs at Project site, whether or not related directly to the Work.

1.4 CONSTRUCTION PHOTOGRAPHS

A. Photographic Media: Digital photos.

B. Preconstruction Photographs: Four photographs illustrating both general and special conditions.

C. Periodic Construction Photographs: Contractor's discretion.

END OF SECTION 01320

# SECTION 01400 - QUALITY REQUIREMENTS

## PART 1 - GENERAL

### 1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

### 1.2 SUMMARY

A. This Section includes administrative and procedural requirements for quality assurance and quality control.

B. Testing and inspecting services are required to verify compliance with requirements specified or indicated. These services do not relieve Contractor of responsibility for compliance with the Contract Document requirements.

1. Specific quality-control requirements for individual construction activities are specified in the Sections that specify those activities. Requirements in those Sections may also cover production of standard products.
2. Specified tests, inspections, and related actions do not limit Contractor's quality-control procedures that facilitate compliance with the Contract Document requirements.
3. Requirements for Contractor to provide quality-control services required by Project Manager, Owner or authorities having jurisdiction are not limited by provisions of this Section.

C. Related Sections include the following:

1. Division 1 Section "Construction Progress Documentation" for developing a schedule of required tests and inspections.
2. Divisions 2 through 16 Sections and special project provisions for specific test and inspection requirements.

### 1.3 DEFINITIONS

A. Quality-Assurance Services: Activities, actions, and procedures performed before and during execution of the Work to guard against defects and deficiencies and ensure that proposed construction complies with requirements.

B. Quality-Control Services: Tests, inspections, procedures, and related actions during and after execution of the Work to evaluate that completed construction complies with requirements. Services do not include contract enforcement activities performed by Project Manager.

C. Mockups: Full-size, physical example assemblies to illustrate finishes and materials. Mockups are used to verify selections made under Sample submittals, to demonstrate aesthetic effects and, where indicated, qualities of materials and execution, and to review construction, coordination, testing, or operation; they are not Samples. Mockups establish the standard by which the Work will be judged and need to be approved prior to construction for that scope of work.

D. Testing Agency: An entity engaged to perform specific tests, inspections, or both. Testing laboratory shall mean the same as testing agency.

1.4 SUBMITTALS

A. Qualification Data: For testing agencies specified in "Quality Assurance" Article to demonstrate their capabilities and experience. Include proof of qualifications in the form of a recent report on the inspection of the testing agency by a recognized authority.

B. Schedule of Tests and Inspections: Prepare in tabular form and include the following:

1. Specification Section and/or item number and title.
2. Description of test and inspection.
3. Identification of applicable standards.
4. Identification of test and inspection methods.
5. Number of tests and inspections required.
6. Time schedule or time span for tests and inspections.
7. Entity responsible for performing tests and inspections.
8. Requirements for obtaining samples.
9. Unique characteristics of each quality-control service.

C. Reports: Prepare and submit certified written reports that include the following:

1. Date of issue.
2. Project title and number.
3. Name, address, and telephone number of testing agency.
4. Dates and locations of samples and tests or inspections.
5. Names of individuals making tests and inspections.
6. Description of the Work and test and inspection method.
7. Identification of product and Specification Section.
8. Complete test or inspection data.
9. Test and inspection results and an interpretation of test results.
10. Ambient conditions at time of sample taking and testing and inspecting.

11. Comments or professional opinion on whether tested or inspected Work complies with the Contract Document requirements.
12. Name and signature of laboratory inspector.
13. Recommendations on retesting and re-inspecting.

D. Permits, Licenses, and Certificates: For Owner's records, submit copies of permits, licenses, certifications, inspection reports, releases, jurisdictional settlements, notices, receipts for fee payments, judgments, correspondence, records, and similar documents, established for compliance with standards and regulations bearing on performance of the Work.

1.5 QUALITY ASSURANCE

A. Fabricator Qualifications: A firm experienced in producing products similar to those indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units.

B. Factory-Authorized Service Representative Qualifications: An authorized representative of manufacturer who is trained and approved by manufacturer to inspect installation of manufacturer's products that are similar in material, design, and extent to those indicated for this Project.

C. Installer Qualifications: A firm or individual experienced in installing, erecting, or assembling work similar in material, design, and extent to that indicated for this Project, whose work has resulted in construction with a record of successful in-service performance.

D. Manufacturer Qualifications: A firm experienced in manufacturing products or systems similar to those indicated for this Project and with a record of successful in-service performance.

E. 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 the system, assembly, or products that are similar to those indicated for this Project in material, design, and extent.

F. Testing Agency Qualifications: An agency with the experience and capability to conduct testing and inspecting indicated, as documented by ASTM E 548, and that specializes in types of tests and inspections to be performed.

G. Preconstruction Testing: Testing agency shall perform preconstruction testing for compliance with specified requirements for performance and test methods.

1. Contractor responsibilities include the following:

a. Provide test specimens and assemblies representative of proposed materials and construction. Provide sizes and configurations of assemblies to adequately demonstrate capability of product to comply with performance requirements.
b. Submit specimens in a timely manner with sufficient time for testing and analyzing results to prevent delaying the Work.
c. Fabricate and install test assemblies using installers who will perform the same tasks for Project.
d. When testing is complete, remove assemblies; do not reuse materials on Project.

2. Testing Agency Responsibilities: Submit a certified written report of each test, inspection, and similar quality-assurance service to Contractor with copy to Project Manager. Interpret tests and inspections and state in each report whether tested and inspected work complies with or deviates from the Contract Documents.

H. Mockups: Before installing portions of the Work requiring mockups, build mockups for each form of construction and finish required to comply with the following requirements, using materials indicated for the completed Work:

1. Build mockups in location and of size indicated or, if not indicated, as directed by Project Manager.
2. Notify Project Manager seven (7) days in advance of dates and times when mockups will be constructed.
3. Demonstrate the proposed range of aesthetic effects and workmanship.
4. Obtain Project Manager's approval of mockups before starting work, fabrication, or construction.
5. Maintain mockups during construction in an undisturbed condition as a standard for judging the completed Work.
6. Demolish and remove mockups when directed, unless otherwise indicated.

## 1.6 QUALITY CONTROL

A. Contractor Responsibilities: Unless otherwise indicated, provide quality-control services specified and required by authorities having jurisdiction.

1. Contractor's shall engage a qualified testing agency to perform all quality-control services.

a. Contractor shall not employ the same entity engaged by Owner, unless agreed to in writing by Owner.

2. Notify testing agencies at least twenty-four (24) hours in advance of time when Work that requires testing or inspecting will be performed.

3. Where quality-control services are indicated as Contractor's responsibility, submit a certified written report, in duplicate, of each quality-control service.
4. Testing and inspecting requested by Contractor and not required by the Contract Documents are Contractor's responsibility.
5. Submit additional copies of each written report directly to authorities having jurisdiction, when they are so directed.

B. Manufacturer's Field Services: Where indicated, engage a factory-authorized service representative to inspect field-assembled components and equipment installation, including service connections. Report results in writing.

C. Retesting/Re-inspecting: Regardless of whether original tests or inspections were Contractor's responsibility, provide quality-control services, including retesting and reinspecting, for construction that revised or replaced Work that failed to comply with requirements established by the Contract Documents.

D. Testing Agency Responsibilities: Cooperate with Project Manager and Contractor in performance of duties. Provide qualified personnel to perform required tests and inspections.

1. Notify Project Manager and Contractor promptly of irregularities or deficiencies observed in the Work during performance of its services.
2. Interpret tests and inspections and state in each report whether tested and inspected work complies with or deviates from requirements.
3. Submit a certified written report, in duplicate, of each test, inspection, and similar quality-control service through Contractor.
4. Do not release, revoke, alter, or increase requirements of the Contract Documents or approve or accept any portion of the Work.
5. Do not perform any duties of Contractor.

E. Associated Services: Cooperate with agencies performing required tests, inspections, and similar quality-control services, and provide reasonable auxiliary services as requested. Notify agency sufficiently in advance of operations to permit assignment of personnel. Provide the following:

1. Access to the Work.
2. Incidental labor and facilities necessary to facilitate tests and inspections.
3. Adequate quantities of representative samples of materials that require testing and inspecting. Assist agency in obtaining samples.
4. Facilities for storage and field-curing of test samples.
5. Delivery of samples to testing agencies.
6. Preliminary design mix proposed for use for material mixes that require control by testing agency.
7. Security and protection for samples and for testing and inspecting equipment at Project site.

F. Coordination: Coordinate sequence of activities to accommodate required quality-assurance and quality-control services with a minimum of delay and to avoid necessity of removing and replacing construction to accommodate testing and inspecting.

1. Schedule times for tests, inspections, obtaining samples, and similar activities.

G. Schedule of Tests and Inspections: Prepare a simple schedule of tests, inspections, and similar quality-control services required by the Contract Documents. Submit schedule within thirty (30) days of date established for the Notice to Proceed.

1. Distribution: Distribute schedule to Project Manager, testing agencies, and each party involved in performance of portions of the Work where tests and inspections are required.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 ACCEPTABLE TESTING AGENCIES

A. General: The Contractor is responsible to retain a qualified testing agency to perform work as required in the specifications and it is his option to select that agency.

3.2 REPAIR AND PROTECTION

A. General: On completion of testing, inspecting, sample taking, and similar services, repair damaged construction and restore substrates and finishes.

1. Provide materials and comply with installation requirements specified in other Sections of these Specifications. Restore patched areas and extend restoration into adjoining areas in a manner that eliminates evidence of patching.
2. Comply with the Contract Document requirements for Division 1 Section "Cutting and Patching."

B. Protect construction exposed by or for quality-control service activities.

C. Repair and protection are Contractor's responsibility, regardless of the assignment of responsibility for quality-control services.

END OF SECTION 01400

# SECTION 01500 - TEMPORARY FACILITIES AND CONTROLS

## 1.1 SUMMARY

A. Temporary Utilities: Contractor is responsible for the following:

1. Sewers and drainage.
2. Water Service: Contractor provided.
3. Sanitary Facilities:
    a. Toilets: Self-contained toilet unit provided by Contractor.
4. Electric Power Service: Contractor provided.

B. Support Facilities: Contractor is responsible for the following:

1. Traffic controls.
2. Dewatering facilities and drains.
3. Waste disposal facilities.
4. On-Site Secured Staging Area
5. Lifts and hoists.
6. Construction aids and miscellaneous services and facilities.

C. Security and Protection Facilities: Contractor is responsible for the following:

1. Stormwater control.
2. Tree and plant protection.
3. Site construction fence.
4. Security enclosure and lockup.
5. Barricades, warning signs.
6. Erosion control/silt fence.

END OF SECTION 01500

# SECTION 01770 - CLOSEOUT PROCEDURES

## PART 1 - GENERAL

### 1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

### 1.2 SUMMARY

A. This Section includes administrative and procedural requirements for contract closeout, including, but not limited to, the following:

1. Inspection procedures.
2. Project Record Documents.
3. Operation and maintenance manuals.
4. Warranties.
5. Instruction of Owner's personnel.
6. Final cleaning.

B. Related Sections include the following:

1. Division 1 Section "Payment Procedures" for requirements for Applications for Payment for Substantial and Final Completion.
2. Division 1 Section "Construction Progress Documentation" for submitting Final Completion construction photographs and negatives.
3. Divisions 2 through 16 Sections for specific closeout and special cleaning requirements for products of those Sections.

### 1.3 SUBSTANTIAL COMPLETION

A. Preliminary Procedures: Before requesting inspection for determining date of Substantial Completion, the contractor is to complete the following. List items below that are incomplete in request.

1. Prepare a list of items to be completed and corrected (punch list), the value of items on the list, and reasons why the Work is not complete.
2. Advise Owner of pending insurance changeover requirements.
3. Submit specific warranties, workmanship bonds, maintenance service agreements, final certifications, and similar documents.

4. Obtain and submit releases permitting Owner unrestricted use of the Work and access to services and utilities. Include occupancy permits, operating certificates, and similar releases.
5. Prepare and submit Project Record Documents, operation and maintenance manuals, Final Completion construction photographs, damage or settlement surveys, property surveys, and similar final record information.
6. Deliver tools, spare parts, extra materials, and similar items to location designated by Owner. Label with manufacturer's name and model number where applicable.
7. Complete startup testing of systems.
8. Submit test/adjust/balance records.
9. Terminate and remove temporary facilities from Project site, along with mockups, construction tools, and similar elements.
10. Submit changeover information related to Owner's occupancy, use, operation, and maintenance.
11. Complete final cleaning requirements, including touchup painting.
12. Touch up and otherwise repair and restore marred exposed finishes to eliminate visual defects.

B. Inspection: Submit a written request for inspection for Substantial Completion. On receipt of request, Project Manager will either proceed with inspection or notify Contractor of unfulfilled requirements. Architect will after inspection notify Contractor of items, either on Contractor's list or additional items identified by Project Manager, that must be completed or corrected before Final completion by owner.

1. Re-inspection: Request re-inspection when the Work identified in previous inspections as incomplete is completed or corrected.
2. Results of completed inspection will form the basis of requirements for Final Completion.

## 1.4 FINAL COMPLETION

A. Preliminary Procedures: Before requesting final inspection for determining date of Final Completion, complete the following:

1. Submit a final Application for Payment and Final Payment Request Documentation according to Division 1 Section "Payment Procedures."
2. Submit a copy of Project Manager's Substantial Completion inspection list of items to be completed or corrected (punch list), endorsed and dated by Landscape Architect. The certified copy of the list shall state that each item has been completed or otherwise resolved for acceptance.
3. Submit evidence of final, continuing insurance coverage complying with insurance requirements.
4. Instruct Owner's personnel in operation, adjustment, and maintenance of products, equipment, and systems.

B. Inspection: Submit a written request for final inspection for acceptance. On receipt of request, Project Manager will either proceed with inspection or notify Contractor of unfulfilled requirements. Project Manager will approve a final Certificate for Payment after inspection or will notify Contractor of construction that must be completed or corrected before certificate will be issued.

1. Re-inspection: Request re-inspection when the Work identified in previous inspections as incomplete is completed or corrected.

## 1.5 LIST OF INCOMPLETE ITEMS (PUNCH LIST)

A. Preparation: Submit three copies of list. Include name and identification of each space and area affected by construction operations for incomplete items and items needing correction including, if necessary, areas disturbed by Contractor that are outside the limits of construction.

## 1.6 PROJECT RECORD DOCUMENTS

A. General: Do not use Project Record Documents for construction purposes. Protect Project Record Documents from deterioration and loss.

B. Record Drawings: Maintain and submit one set of blue- or black-line white prints of Contract Drawings and Shop Drawings.

1. Mark Record Prints to show the actual installation where installation varies from that shown originally. Require individual or entity who obtained record data, whether individual or entity is Installer, subcontractor, or similar entity, to prepare the marked-up Record Prints.

    a. Give particular attention to information on concealed elements that cannot be readily identified and recorded later.
    b. Accurately record information in an understandable drawing technique.
    c. Record data as soon as possible after obtaining it. Record and check the markup before enclosing concealed installations.
    d. Mark Contract Drawings or Shop Drawings, whichever is most capable of showing actual physical conditions, completely and accurately. Where Shop Drawings are marked, show cross-reference on Contract Drawings.

2. Mark record sets with erasable, red-colored pencil. Use other colors to distinguish between changes for different categories of the Work at the same location.
3. Mark important additional information that was either shown schematically or omitted from original Drawings.
4. Note Construction Change Directive numbers, Change Order numbers, alternate numbers, and similar identification where applicable.

5. Identify and date each Record Drawing; include the designation "PROJECT RECORD DRAWING" in a prominent location. Organize into manageable sets; bind each set with durable paper cover sheets. Include identification on cover sheets.

C. Record Specifications: Submit one copy of Project's Specifications, including addenda and contract modifications. Mark copy to indicate the actual product installation where installation varies from that indicated in Specifications, addenda, and contract modifications.

1. Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.
2. Mark copy with the proprietary name and model number of products, materials, and equipment furnished, including substitutions and product options selected.
3. Note related Change Orders where applicable.

D. Record Product Data: Submit one copy of each Product Data submittal. Mark one set to indicate the actual product installation where installation varies substantially from that indicated in Product Data.

1. Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.
2. Include significant changes in the product delivered to Project site and changes in manufacturer's written instructions for installation.
3. Note related Change Orders where applicable.

1.7 OPERATION AND MAINTENANCE MANUALS (AS REQUESTED BY OWNER)

A. Maintenance Data:

1. Manufacturer's information, including list of spare parts.
2. Name, address, and telephone number of Installer or supplier.
3. Maintenance procedures.
4. Maintenance and service schedules for preventive and routine maintenance.
5. Maintenance record forms.
6. Sources of spare parts and maintenance materials.
7. Copies of maintenance service agreements.
8. Copies of warranties and bonds.

B. Organize operation and maintenance manuals into suitable sets of manageable size. Bind and index data in heavy-duty, 3-ring, vinyl-covered, loose-leaf binders, in thickness necessary to accommodate contents, with pocket inside the covers to receive folded oversized sheets. Identify each binder on front and spine with the printed title "OPERATION AND MAINTENANCE MANUAL," Project name, and subject matter of contents.

1.8 WARRANTIES

A. Submittal Time: Submit written warranties on request of Owner for designated portions of the Work where commencement of warranties other than date of Substantial Completion is indicated.

B. Partial Occupancy: Submit properly executed warranties within fifteen (15) days of completion of designated portions of the Work that are completed and occupied or used by Owner during construction period by separate agreement with Contractor.

C. Organize warranty documents into an orderly sequence based on the table of contents of the Project Manual.

1. Bind warranties and bonds in heavy-duty, 3-ring, vinyl-covered, loose-leaf binders, thickness as necessary to accommodate contents, and sized to receive 8-1/2-by-11-inch paper.

D. Provide additional copies of each warranty to include in operation and maintenance manuals.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Cleaning Agents: Use cleaning materials and agents recommended by manufacturer or fabricator of the surface to be cleaned. Do not use cleaning agents that are potentially hazardous to health or property or that might damage finished surfaces.

PART 3 - EXECUTION

3.1 FINAL CLEANING

A. General: Provide final cleaning. Conduct cleaning and waste-removal operations to comply with local laws and ordinances and Federal and local environmental and antipollution regulations.

B. Cleaning: Employ experienced workers or professional cleaners for final cleaning. Clean each surface or unit to condition expected in an average commercial building cleaning and maintenance program. Comply with manufacturer's written instructions.

1. Complete the following cleaning operations before requesting inspection for certification of Substantial Completion for entire Project or for a portion of Project:

    a. Clean Project site, yard, and grounds, in areas disturbed by construction activities, including landscape development areas, of rubbish, waste material, litter, and other foreign substances.
    b. Sweep paved areas broom clean. Remove petrochemical spills, stains, and other foreign deposits.
    c. Rake grounds that are neither planted nor paved to a smooth, even-textured surface.
    d. Remove tools, construction equipment, machinery, and surplus material from Project site.
    e. Clean exposed exterior and interior hard-surfaced finishes to a dirt-free condition, free of stains, films, and similar foreign substances. Avoid disturbing natural weathering of exterior surfaces. Restore reflective surfaces to their original condition.
    f. Remove debris and surface dust from limited access spaces, including roofs, plenums, shafts, trenches, equipment vaults, manholes, attics, and similar spaces.
    g. Remove labels that are not permanent.
    h. Touch up and otherwise repair and restore marred, exposed finishes and surfaces. Replace finishes and surfaces that cannot be satisfactorily repaired or restored or that already show evidence of repair or restoration.

        1) Do not paint over "UL" and similar labels, including mechanical and electrical nameplates.

    i. Wipe surfaces of mechanical and electrical equipment and similar equipment. Remove excess lubrication, paint and mortar droppings, and other foreign substances.
    j. Replace parts subject to unusual operating conditions.
    k. Clean light fixtures, lamps, globes, and reflectors to function with full efficiency. Replace burned-out bulbs, and those noticeably dimmed by hours of use, and defective and noisy starters in fluorescent and mercury vapor fixtures to comply with requirements for new fixtures.
    l. Power wash all site items.
    m. Leave Project clean and ready for occupancy.

C. Comply with safety standards for cleaning. Do not burn waste materials. Do not bury debris or excess materials on Owner's property. Do not discharge volatile, harmful, or dangerous materials into drainage systems. Remove waste materials from Project site and dispose of lawfully.

END OF SECTION 01770

# DIVISION 2

# TECHNICAL SPECFICATIONS

SECTION 02751 - CEMENT CONCRETE PAVEMENT

1. GENERAL

1.1 WORK INCLUDES

A. Base Bid:

1. General Contractor shall provide:

a. Labor, materials, and equipment necessary for poured in place Portland cement concrete pavement, including curbs and sidewalks, as located on the Drawings and as specified herein.

1.2 REFERENCES:

A. American Concrete Institute (ACI):

1. 305R - Hot-Weather Concreting.

2. 306R - Cold-Weather Concreting.

B. American Society for Testing and Materials (ASTM):

1. A615/A615M - Deformed and Plain Billet-Steel Bars for Concrete Reinforcement.

2. A616/A616M - Rail-Steel Deformed and Plain Bars for Concrete Reinforcement.

3. C309 - Liquid Membrane-Forming Compounds for Curing Concrete.

4. D1751 - Preformed Expansion Joint Fillers for Concrete Paving and Structural Construction (Nonextruding and Resilient Bituminous Types).

5. D1752 - Preformed Sponge Rubber and Cork Expansion Joint Fillers for Concrete Paving and Structural Construction.

6. D6690 - Joint and Crack Sealants, Hot Applied, for Concrete and Asphalt Pavements.

C. American Association of State Highway and Transportation Officials (AASHTO):

1. Gg M6 - Fine Aggregates for Portland Cement Concrete.

2. M80 - Coarse Aggregates for Portland Cement Concrete.

3. T26 - Quality of Water to be Used in Concrete.

D. Federal Specifications (FS):

1. CCC-C-467 - Cloth, Burlap, Jute, (or Kenaf).

E. IDOT Standard Specifications for Road and Bridge Construction in Illinois (SSRBC), April 1, 2022 edition and latest Supplemental Specifications and Recurring Special Provisions.

F. IDOT Supplemental Specifications and Recurring Special Provisions, January 1, 2023 edition.

1.4 QUALITY ASSURANCE

A. Sampling and Testing:

1. When incorporating materials into the Work, quality control testing will be performed during construction by a testing laboratory retained by the A/E.

2. Furnish specific schedule for sampling to provide Testing Service the opportunity to schedule sampling and A/E to observe sampling.

3. Copies of reports and certificates regarding tests and inspection of equipment, materials and completed Work shall be distributed as specified in Division 1.

2. PRODUCTS

2.1 FORMS

A. Forms shall conform to requirements in Article 1103.05 of IDOT/SSRBC.

2.2 STEEL REINFORCEMENT

A. Welded wire fabric shall conform to the requirements of Article 1006.10 of IDOT/SSRBC.

B. Dowels shall be smooth round steel bars of sizes indicated and conforming to the requirements of Article 1006.11 of IDOT/SSRBC.

C. Tie bars shall be deformed and of the sizes indicated and conforming to the requirements of Article 1006.10 of IDOT/SSRBC.

D. Metal accessories used to support dowels and tiebars shall be designed to hold these items rigidly in place in the center of the slab parallel to the pavement surface without displacement.

E. Metal dowel caps or tubes shall be 32-gage sheet metal of proper size to fit dowels indicated.

1. Indent 1/8 of an inch to provide a limiting stop.

2. Provide unobstructed expansion space of not less than 1 inch.

2.3 CONCRETE

A. Compressive strength: 4000 psi at 28 days.

B. Portland Cement:

1. Furnish cement conforming to the requirements in Section 1001 of IDOT/SSRBC.

2. Use only one brand.

C. Coarse Aggregate:

1. Coarse aggregate shall conform to the requirements of Section 1004 of IDOT/SSRBC.

2. Gradation shall conform to Article 1004.01 of IDOT/SSRBC.

3. Coarse Aggregate shall be crushed limestone.

D. Water:

1. Mixing and curing water shall be clean, clear, and free from sewage, oil, acid, alkali, salt, organic matter, or other substances injurious to the finished product.

2. Potable water will be accepted without testing.

3. Nonpotable water shall be tested in accordance with, and shall meet the suggested requirements of, AASHTO T26.

E. Admixtures:

1. Air-entraining agents shall be neutralized Vinsol Resin conforming to the requirements in Article 1021.01 of IDOT/SSRBC.

a. Conform to manufacturer's recommendations for use.

b. Technical assistance of the manufacturer's field representative shall be furnished upon request.

2. Use of set-retarding and water-reducing admixtures, when requested in writing by Contractor, will be permitted only with the written approval of CDB.

a. Shall conform to requirements in Article 1021.03 of IDOT/SSRBC.

b. Furnish evidence of satisfactory performance on other work for the specific brand proposed for use.

c. Compatible with concrete mixture.

3. Additional compensation will not be allowed for water-reducing and set-retarding admixtures.

2.4 EXPANSION JOINT FILLER

A. Fiber board per Article 1059.01 of IDOT/SSRBC.

2.5 JOINT DOWELS

A. Smooth round dowels having at least one-half the length of each dowel coated to ensure that no bond is developed between dowel and concrete.

B. Conform to ASTM A615M (A615), Intermediate Grade or ASTM A616M (A616), Regular Grade.

2.6 JOINT SEALER

A. Hot poured joint sealer per Article 1050.02 of IDOT/SSRBCC.

2.7 CURING COMPOUND

A. Conform to ASTM C309, Type I OR Type I-D.

2.8 DETECTABLE WARNING SURFACES

A. Concrete block-out to allow for detectable paving units. Do not stamp pattern on poured concrete.

2.9 PAVEMENT MARKINGS

A. Alkyd resin marking paint.

3. EXECUTION

3.1 FORMS

A. Installation shall conform to requirements in Article 420.06 of IDOT/SSRBC.

B. Use flexible forms for all curved form lines except:

1. Curves having a radius of 200 feet or greater may be formed in 10-foot or shorter chords.

2. Curves having a radius of 100 feet or greater may be formed in 5-foot or shorter chords.

C. Thoroughly clean, oil, securely stake, brace, and hold forms to line and grade.

D. Remove forms from front face of curb section at the time necessary to permit finishing concrete. Leave other forms in place not less than 12 hours after placement of concrete.

3.2 CONCRETE HANDLING

A. Handling and storage of materials shall conform to requirements of Article 1020.10 of IDOT/SSRBC.

B. Concrete mixture shall be Class PV for pavement restoration base course and Class SI for all other applications and shall conform to the requirements in Sections 420 and 423 of IDOT/SSRBC.

C. Paving Mixers:

1. Ready Mix: Ready-mix equipment and operation shall conform to requirements in Article 1103.04 of IDOT/SSRBC.

D. Transportation of concrete shall conform to requirements in Article 1020.11 of IDOT/SSRBC.

E. Transporting equipment shall conform to requirements in Article 1103.04 of IDOT /SSRBC.

3.3 PLACING AND FINISHING

A. Sequence of placing and finishing shall conform to requirements in Article 420.07 of IDOT/SSRBC.

B. Placing Concrete:

1. Place only on prepared and approved subgrade.

2. Lightly moisten surface of dry subgrade before placing concrete.

3. Deposit and compact concrete in manner to avoid displacement of forms and joint materials.

4. Tamp or vibrate concrete sufficiently to eliminate all voids and bring the mortar to the top for finishing

C. Finishing Concrete:

1. Edge concrete with proper edging tools.

2. Tool radii as soon as possible after concrete has taken its initial set.

3. Remove curb face forms and rub with rubbing block and water until all blemishes, forms, and tool marks have been removed.

4. Float-finish with wood float or concrete rubbing block until concrete is true to line, grade, and cross section, and is uniform in texture.

5. Brush with hairbrush as follows:

a. Curb and curb and gutter parallel to the line of curb.

b. Flatwork Medium-Textured California Broom Finish: Draw a medium bristle broom across float-finished concrete surface perpendicular to line of traffic to provide a uniform texture. Provide a smooth trowel edge on all four (4) sides of pavement as illustrated in construction documents.

6. Do not use mortar topping or sand and cement dryer.

D. Tolerances:

1. Applies to conventional and slip-form construction.

2. Alignment deviation of finished concrete Work not to exceed 1/4-inch in 10 feet from true line and grade.

3.4 JOINTS

A. Joint construction shall conform to the requirements in Article 420.05 of IDOT/SSRBC.

B. Contraction Joints:

1. Construct at locations indicated and as follows:

a. Divide concrete curb, curb and gutter, median, and paved drainage into monolithic sections not greater than 10 feet in length.

b. Match contraction joint spacing of adjacent Portland cement concrete pavement.

c. Divide sidewalks as shown on plans or into approximately square areas if not shown.

2. Form contraction joints by the following methods:

a. Tooled Joints:

1. Form contraction joints after initial floating by grooving and finishing each edge of joint with groover tool to a 1/8 inch radius. This is the preferred scoring method for all concrete work.

b. Sawed Joints:

1. Form contraction joints with power saws equipped with shatterproof abrasive or diamond-rimmed blades. Cut 1/8-inch wide joints into concrete when cutting action will not tear, abrade, or otherwise damage surface and before developing random contraction cracks. This is an alternate method in large concrete areas to be poured and requires Project Manager approval unless indicated on plans to be sawed cut joints.

C. Expansion Joints:

1. Construct at the following locations:

a. Locations as indicated on the Drawings.

b. All points of curvature and points of tangency of curves having a radius of 100 feet or less, and at intervals not exceeding 60 feet in tangent section.

c. Locations matching expansion joint spacing of adjacent portland cement concrete pavement.

d. Locations where curb, curb and gutter, sidewalk, median, or paved drainage abut each other or other structures and slabs.

2. Stake, support, and secure local transfer dowels and preformed joint filler in position to prevent displacement during placing and finishing operations.

3. Round edges of joints with an edging tool of 1/4-inch radius.

D. Key Joints:

1. Construct at locations indicated for paved drainage and curb and gutter adjacent to portland cement concrete pavement.

E. Construction Joints:

1. Locate to coincide with contraction, expansion, or key joints.

2. When concrete placement is interrupted between joint locations for a sufficient time for the concrete to take its initial set, remove concrete to the nearest joint location before resuming placement.

3. Make transverse construction joints in paved drainage having a thickness of 6 inches or greater by either key joints or expansion joints.

3.5 CONCRETE CURING AND PROTECTION

A. Curing and protection of concrete shall conform to the requirements in Articles 420.21, 606.11 and 1020.13 of IDOT/SSRBC.

B. Curing:

1. Spray all exposed surfaces after finishing with curing compound.

2. Apply curing compound at a rate of not less than 1 gallon per 25 square yards of surface area.

3. Apply second coat at a rate of not less than 1 gallon per 30 square yards 30 minutes after first-coat application when the atmospheric temperature exceeds 100 degrees F.

C. Protection:

1. Protect the finished Work from damage until final acceptance.

2. Repair, replace, or clean all concrete damaged or discolored prior to final acceptance.

3. When pavement is constructed after October 15, protective coat application shall be applied in accordance with IDOT/SSRBC articles 420.21 and 1023.01.

3.6 JOINT SEALING

A. Seal all expansion joints and contraction joints 1/4-inch or greater in width.

B. Do not seal portions of expansion joints located in vertical parts of curbs.

C. Remove curing compound and other material from joint surfaces before sealing. Joint shall be clean and surface dry at time of sealant application.

D. Apply joint sealant using methods and equipment necessary to ensure complete filling of the joint space without voids or air bubbles.

E. Apply sealant to conform to sealant manufacturer's instructions.

F. Apply finished sealant from 1/8-inch below to level with adjacent concrete surfaces.

G. Protect adjacent surfaces to prevent contamination with sealant material.

H. Protect sealant until it has set up or cured sufficiently to preclude pickup or tracking.

END OF SECTION 02751

# SECTION 02791 - PLAYGROUND SURFACE SYSTEMS

## PART 1 - GENERAL

### 1.1 DEFINITIONS

A. Critical Height: Standard measure of shock attenuation. According to CPSC No. 325, this means "the fall height below which a life-threatening head injury would not be expected to occur."

B. Fall Height: According to ASTM F 1487, this means "the vertical distance between a designated play surface and the protective surfacing beneath it." The fall height of playground equipment should not exceed the Critical Height of the protective surfacing beneath it.

C. Use Zone: According to ASTM F 1487, this means "the area beneath and immediately adjacent to a play structure that is designated for unrestricted circulation around the equipment and on whose surface it is predicted that a user would land when falling from or exiting the equipment."

### 1.2 SUBMITTALS

A. Product Data: For each type of product indicated. Include material descriptions and construction details for each component of playground surface system.

B. Product Samples: For the following:

1. Minimum 1-quart loose fill sealed in a container.
2. 12-by-12-inch minimum sample of geosynthetic fabric.
3. 6-by-6-inch minimum sample of geosynthetic, molded-sheet drainage panel.

C. Installer Certificates: Signed by manufacturer certifying that installers comply with requirements.

D. Product Certificates: Signed by manufacturers of playground surface systems certifying that protective surfacings furnished comply with requirements.

E. Product Test Reports: From a qualified testing agency indicating playground surface system complies with requirements, based on comprehensive testing of current products.

F. Material Certificates: Signed by manufacturers certifying that each of the following items complies with requirements:

1. Wood Chips.
2. Wood Fiber.

G. Material Test Reports: From a qualified testing agency indicating material complies with requirements.

H. Maintenance Data: For playground surface system to include in maintenance manuals specified in Division 1.

## 1.3 QUALITY ASSURANCE

A. Installer Qualifications: An experienced installer who has specialized in installing work similar in material, design, and extent to that indicated for this Project and whose work has resulted in installations with a record of successful in-service performance.

B. Testing Agency Qualifications: An independent testing agency with the experience and capability to conduct the testing indicated, as documented according to ASTM E 548.

C. Source Limitations: Provide secondary materials including adhesives, anchoring materials, filler/sealant material, geosynthetics, and repair materials of type and from source recommended by manufacturer of primary playground surface system materials.

D. Source Limitations: Obtain primary seamless playground surface system materials, including primers, binders, and rubber particles for cushion-base and wearing-surface layers, through one source from a single playground surface system manufacturer. Provide secondary materials including adhesives, primers, geosynthetics, and repair materials of type and from source recommended by manufacturer of primary playground surface system materials.

E. Standards and Guidelines: Provide playground surface systems complying with applicable provisions of the following, unless more stringent provisions are indicated:

1. CPSC No. 325, "Handbook for Public Playground Safety"; ASTM F 1292; and ASTM F 1487.

## 1.4 DELIVERY, STORAGE, AND HANDLING

A. Deliver manufactured materials in original packages with seals unbroken and bearing manufacturer's labels indicating brand name and directions for storing.

B. Store manufactured materials in a clean, dry location, protected from the weather and deterioration, and complying with manufacturer's written instructions for minimum and maximum temperature requirements for storage.

C. Store mat, tile units on flat surfaces.

D. Protect UV-light-sensitive materials from exposure to sunlight.

1.5 PROJECT CONDITIONS

A. Environmental Limitations: Do not apply playground surface system materials or components over wet, frozen, or excessively damp substrates if prohibited by manufacturer's written instructions or warranty requirements.

B. Weather Limitations: Proceed with installation only when existing and forecasted weather conditions permit playground surface system to be performed according to manufacturer's written instructions or warranty requirements.

C. Field Measurements: Where playground surface system is indicated to fit to other construction, verify dimensions of other construction by field measurements.

D. Adhesively Applied Products: As follows:

1. Apply adhesives only when temperature of surfaces to be adhered to and ambient air temperatures are within range permitted by manufacturer's written instructions.
2. Close area to traffic during surfacing installation and for time period after installation recommended in writing by manufacturer.
3. Do not install products over asphalt paving until paving is sufficiently cured to bond with adhesive.
4. Do not install products over concrete slabs until slabs have cured and are sufficiently dry and surfaces are within acceptable pH range to bond with adhesive, as determined by surfacing manufacturer's recommended procedures.

1.6 COORDINATION

A. Coordinate construction of playground surface systems with installation of playground equipment, including accurate use zones and fall heights, specified in Division 2 Section "Playground Equipment and Structures."

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work.

2.2 PLAYGROUND SURFACE SYSTEMS, GENERAL

A. Accessibility: Provide playground surface system determined to be accessible when tested according to current ASTM standard for system designated.

2.3 PLAYGROUND SURFACE SYSTEMS

A. General: Provide playground surface system consisting of particulate loose fill materials indicated, free of deleterious materials. All delivery tickets for playground surfacing shall be submitted to the Park District,

B. Organic Wood-Based Materials: Consisting of the following:

1. Engineered Wood Fibers: Random-sized wood fibers, in manufacturer's standard fiber size approximately 10 times longer than wide; containing no bark, leaves, twigs, or foreign or toxic materials; graded according to manufacturer's standard specification for material consistency for playground surfaces. Provide the following minimum depth of material with Critical Height indicated for coordination with fall heights not exceeding Critical Height:
   a. Compressed Material Depth: 12-inch depth with Critical Height of 12 feet. Installed depth shall be a minimum of 14-inch depth.

2.4 GEOSYNTHETICS

A. Drainage/Separation Fabric: Nonwoven needle-punched geotextile, specifically manufactured as a drainage geotextile; made from polyolefins or polyesters; complying with the following minimum properties determined according to ASTM D 4759 and referenced standard test methods:

1. The following min. criteria: Weight: **4 oz./sq. yd.** according to ASTM D 5261. & Water Flow Rate: **100 gpm per sq. ft.** according to ASTM D 4491.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for subgrade and substrate conditions, for compliance with playground surface system manufacturer's requirements, and for other conditions affecting performance.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Stake locations of playground perimeter, playground equipment, use zones, and pathways. Clearly indicate locations of utilities, lawn sprinkler system, subgrade drainage systems, and underground structures.

B. General: Prepare substrates to receive surfacing products according to playground surface system manufacturer's written instructions. Verify that substrates are sound without high spots, ridges, holes, and depressions.

3.3 INSTALLATION, GENERAL

A. General: Comply with playground surface system manufacturer's written installation instructions. Install playground surface system over area and in thickness indicated and as required to comply with specified requirements for impact-attenuation performance and, where indicated, for accessibility.

3.4 INSTALLATION OF LOOSE FILL PLAYGROUND SURFACE SYSTEMS

A. Loose Fill Edgings: Place in layout indicated on Drawings and permanently secure in place and attach to each other, according to edging manufacturer's written instructions, with top of edging at elevation indicated.

B. Loose Fill: Place playground surfacing materials in excavations promptly, including manufacturer's standard amount of excess material for compacting naturally with time to required elevations, but not before the following have occurred:

1. Completion of subgrade construction including drainage course, drainage/separation geosynthetic layer and weed barrier.
2. Installation of playground equipment support posts and foundations.
3. Installation of containment edgings.
4. Removal of obstructions, trash, debris, and waste fill materials.

C. Compacting and Grading: Uniformly compact and grade areas according to manufacturer's written instructions to an even surface free from irregular surface changes and to cross sections, lines, and elevations indicated. Unless otherwise indicated, provide a smooth transition between adjacent existing grades and new grades.

D. Finish Grading: Hand rake to a smooth finished surface and to required elevations with zero tolerance. Loose fill shall be level across playground and even with new playground border (allowing for compaction).

## 3.5 CLEANING AND PROTECTION

A. Non-Loose Fill Systems: Prevent traffic over system for not less than 48 hours after installation. Protect playground surface system from damage and wear during the remainder of construction period. Clean playground surface system after time period recommended in writing by playground surface system manufacturer but not more than four days before dates scheduled for inspections intended to establish date of Substantial Completion. Use cleaning materials and procedures recommended in writing by playground surface system manufacturer.

B. Loose Fill Systems: Protect newly graded areas from traffic and erosion. Keep free of trash and debris. Replenish with matching material, repair, and reestablish densities and finish elevations where surfaces become eroded, rutted, or settled or where they lose compaction and depth, until date of Substantial Completion.

END OF SECTION 02791

# ATHLETIC & RECREATIONAL SURFACES 02790

**Pro –Techs Surfacing LLC**

## 1. Product Name

Perma-Play 2-Layer Poured-In-Place Playground Surfacing w/ Aromatic urethane

## 2. Manufacturer

Pro-Techs Surfacing LLC
P.O. Box 301
Sharon Center, OH, OH 44274
(330)-576-6058
info@pro-techssurfacing.com
http://www.pro-techssurfacing.com

## 3. Product Description

BASIC USE
Perma-Play 2-Layer Poured-In-Place Playground Surfacing is designed for playgrounds and water play areas.

COMPOSITION & MATERIALS
Perma-Play 2-Layer Poured-In-Place Playground Surfacing is a 2-layer system. The basemat material consists of 100% post-consumer recycled, 3/8" shredded, SBR (styrene butadiene rubber) and high-grade aromatic polyurethane. The top surface consists of EPDM (Ethylene Propylene Diene Monomer) rubber, with the black EPDM being recycled post-industrial material, ranging in size from 1 – 3 mm, and high-grade aromatic or aliphatic polyurethane.

PRODCUT DEMINSIONS:
The height of the playground equipment determines the required basemat thickness. Basemat thicknesses may vary throughout a playground site. Basemat thicknesses are determined by the "Critical Fall Height" requirements through ASTM testing. All ASTM test results are available upon request.

Thicknesses Available
2.0" – up to 4ft. CFH
2.75" – up to 6ft. CFH
3.0" – up to 7ft. CFH
3.5" – up to 8ft. CFH
4.0" – up to 10ft. CFH
5.0" – up to 12ft. CFH

TOP SURFACE THICKNESS:
0.5" thickness nominally

TOP SURFACE STANDARD COLOR OPTIONS:

- Red EPDM
- Bright Green EPDM
- Blue EPDM
- Beige EPDM
- Gray EPDM
- Purple EPDM
- Brown EPDM
- Dark Gray EPDM
- Gold EPDM
- Custom color combinations
- Dark Green EPDM
- Light Beige EPDM
- Light Green EPDM
- Yellow EPDM
- Pearl EPDM
- Light Blue EPDM
- Dark Blue EPDM
- Teal EPDM
- Black EPDM

LIMITATIONS
As a precautionary maintenance measure, a list of chemicals known to damage Perma-Play 2-Layer Poured-In-Place Playground Surfacing and similar rubber safety surfaces is available upon request.
In water play areas, pool surrounds and similar applications. Pool chemicals may affect coloration of the rubber safety surface over time. This condition, should it occur, is not considered to be a product failure.
A "YELLOWISH" shading of the rubber top surface will be noticeable in some colors when using standard aromatic polyurethane binder. This slight yellowing is more pronounced in certain colors and is a common affect in the pour in place rubber safety surface industry. An aliphatic binder, which greatly minimizes the yellowish shading, is available at a higher cost. Both binding materials can be used on a project to maximize aesthetics with lighter colors that are affected by the yellowing and minimize cost. Consult Pro-Techs Surfacing LLC for more information.

## 4. Technical Data

APPLICABLE STANDARDS
ASTM International

- ASTM D412 Standard Test Methods for Vulcanized Rubber and Thermoplastic Rubbers and Thermoplastic Elastomers-Tension
- ASTM D624 Standard Test Methods for Tear Strength of Conventional Vulcanized Rubber and Thermoplastic Elastomers
- ASTM C1028 Standard Test Method for Determining the Static Coefficient of Friction of Ceramic Tile and Other Like Surfaces by the Horizontal Dynamometer Pull Meter Method
- ASTM D2859 Standard Test Method for Flammability of Finished Textile Floor Covering Materials
- ASTM E303 Standard Test Method for Measuring Surface Frictional Properties Using the British Pendulum Tester
- ASTM F1292 Standard Specification for Impact Attenuation of Surface Systems Under and Around Playground Equipment
- ASTM F1951 Standard Specification for Determination of Accessibility of Surface Systems Under and Around Playground Equipment

ENVIRONMENTAL CONSIDERATIONS
This system makes extensive use of recycled tire rubber as a major component.
PHYSICAL/CHEMICAL PROPERTIES

- Shock Attenuation (ASTM F1292)
  – Gmax - Less than 200
  – Head Injury Criteria – 1000 or less
- Accessibility (ASTM 1951)
  Straight Baseline Propulsion - 12.15 lbs Work/ft-Force
  Turning Baseline Propulsion - 7.30 lbs Work/ft-Force
- Tensile Strength (ASTM D412) - 17.51 PSI
- Tear Resistance (ASTM D624) - 6.26 lbs/force/inch
- Dry Static Coefficient of Friction (ASTM C1028) - 0.77
- Wet Static Coefficient of Friction (ASTM C1028) - .56
- Wet Skid Resistance (ASTM E303) – 51
- Flammability (ASTM D2859) – Pass
- Water Permeability (ASTM F1551-03) gal/min/yd2 = 363.5

Required mix proportions by weight:
Basement – 16% polyurethane, 100# rubber
Top course – 22% polyurethane, 110# rubber

## 5. Installation

PREPARATORY WORK
EPDM Rubber materials should be protected from exposure to harmful environmental conditions (moisture) and at a minimum temperature of 40 degrees F and a maximum temperature of 95 degrees F. Install surfacing system when minimum ambient temperature is 40 degrees F and maximum ambient temperature is 95 degrees F. Basemat may be installed in a light rain. Do not install Top Coat in any type of moisture or precipitation.

SUBSTRATE PREPARATION
1. Compacted Stone Base
Substrate must be in accordance with surfacing manufacturers Compacted Stone Base Installation Instructions before Perma-Play 2-Layer Poured-In-Place Playground Surfacing can be applied.

2. Asphalt Substrate
New asphalt substrates must be allowed to cure for a minimum of 30 days before Perma-Play 2-Layer Poured-In-Place Playground Surfacing can be applied.

3. Concrete Substrate
New concrete substrates must cure for a minimum of 10 days before Perma-Play 2-Layer Poured-In-Place Playground Surfacing can be applied.

**NOTE:** Proper drainage is crucial to the longevity of the Perma-Play 2-Layer Poured-In-Place Playground Surfacing. Inadequate drainage will cause premature breakdown of the product in affected areas; and void the warranty.

BASIC METHODS
Installation
Perma-Play 2-Layer Poured-In-Place Playground Surfacing can not proceed until all applicable site work, including substrate preparation, fencing, playground equipment installation and other relevant work, has been completed and approved by a Pro-Techs Surfacing LLC representative.

Basemat Primer
Using a bristle brush, apply ample urethane primer to all curbing and or vertical substrates, which the rubber surfacing system will contact.

Basemat Installation
Using screed sticks and gauge poles, install the basemat rubber materials to 1/8" – 1/4" higher than required thickness. Using pool trowels, pull the basemat material together using consistent pressure throughout. Repeat the process until all areas, including use zones, comply with the architectural plans and specification requirements. Allow basemat to cure for sufficient time (24 hours) so that indentations are not left in the basemat material. Installation contractor must verify that the basemat has cured sufficiently before applying the finished topcoat

Topcoat Primer
Using a bristle brush apply urethane binder to the existing 1/2" of curbing and any other vertical structures within the installation areas, and also to the basemat material at a minimum of 2" around the perimeter of the topcoat area.

Topcoat Installation
Screed the EPDM topcoat rubber granules to a nominal 5/8" thickness to allow for compaction. Using a pool trowel, pull together material using consistent pressure throughout to produce the end result of 1/2" thickness. Any area in excess of 2500 sf may be seamed as deemed necessary by Pro-Techs Surfacing, LLC. Any area less than 2500 sf will be completed seamlessly as conditions allow.

*** NOTE** – Allow topcoat to cure for 24 hours to 72 hours contingent on the humidity and temperature. Protect newly installed topcoat from foot traffic or equipment usage until the Perma-Play 2-Layer Poured-In-Place Playground Surfacing has fully cured. Complete installation recommendations are available from a Pro-Techs Surfacing LLC representative.

### 6. Warranty

Standard warranty period for Perma-Play 2-Layer Poured-In-Place Playground Surfacing is for 5 years from completion of installation. Contact Pro-Techs Surfacing, LLC for 7 year & 10 year warranty options.

### 7. Maintenance/Cleaning – Outdoor & Indoor Applications

Outdoor Applications -

Using a standard leaf blower or broom, remove any light weight debris such as leaves, trash, etc. Using a watering hose or a pressure washer, not exceeding 1000 PSI, rinse off all excess debris from the surface. While surface is wet, apply a mild cleaning detergent and agitate lightly with a soft bristle brush. Repeat as necessary. Once clean, final rinse with low-pressure water from a hose to remove any excess- cleaning agents.

Indoor Applications –

Using a standard vacuum cleaner/shop vac, or broom, remove any light weight unwanted debris. Apply a mild cleaning detergent and agitate lightly with a soft bristle brush or mop. Repeat as necessary. Once clean, final mop with clean hot water to remove any excess detergent. Be sure to not saturate the mop head. Mop head should be damp at most.

### 8. Technical Services

Pro-Techs Surfacing LLC works closely with the contractor to ensure the site is prepared and the installation is on schedule. For technical assistance, contact Pro-Techs Surfacing LLC.

### 9. Quality Assurance

Qualifications – Utilize an installer certified and trained by the manufacturer of playground surfacing system, having experience with other projects of the scope and scale of the work described in this section.

Certifications – Certification by manufacturer that installer is an approved applicator of Perma-Play 2-Layer Poured-In-Place Playground Surfacing.

International Play Equipment Manufacturers Association (IPEMA) Certified

# SECTION 02821 - CHAIN-LINK FENCES (VINYL)

## 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. This Section includes the following:
   1. PVC-coated, steel chain-link fabric.
   2. Galvanized steel framework.

B. Related Sections include the following:

   1. Division 2 Section "Earthwork" for filling and for grading work.

### 1.3 SUBMITTALS

A. Product Data: Material descriptions, construction details, dimensions of individual components and profiles, and finishes for the following:

   1. Fence and gate, posts, rails, and fittings.
   2. Chain-link fabric, reinforcements, and attachments.

B. Samples for Verification: For the following products, in sizes indicated, showing the full range of color, texture, and pattern variations expected. Prepare Samples from the same material to be used for the Work.

C. Product Certificates: Signed by manufacturers of chain-link fences and gates certifying that products furnished comply with requirements.

D. Qualification Data: For firms and persons specified in "Quality Assurance" Article to demonstrate their capabilities and experience. Include lists of completed projects with project names and addresses, names and addresses of architects and owners, and other information specified.

### 1.4 QUALITY ASSURANCE

A. Installer Qualifications: An experienced installer who has completed chain-link fences and gates similar in material, design, and extent to those indicated for this Project and whose work has resulted in construction with a record of

successful in-service performance. The installer must document their experience on three (3) projects of similar size and character.

1.5 PROJECT CONDITIONS

A. Field Measurements: Verify layout information for chain-link fences and gates shown on Drawings in relation to property survey and existing structures. Verify dimensions by field measurements. Location and layout to be approved in field by Project Manager before installation begins. The contractor will be held responsible for all costs to correct layout if not Owner approved before installation has begun.

PART 2 - PRODUCTS

2.1 CHAIN-LINK FENCE FABRIC

A. Aluminum-Coated (Aluminized) Fabric: ASTM A 491, coated with metallic coating Type I, aluminum coated (aluminized), applied before weaving.

1. PVC-Coated Fabric: ASTM F 668, minimum 0.4 oz./sq. ft over metallic coated steel wire.

a. Metallic Coating: Aluminum.
b. Color: Black complying with ASTM F 934.

2. Line Fence Mesh and Wire Size: 2-inch mesh fencing of #9 gauge.

B. Selvage: Top edge knuckled and bottom edge knuckled.

2.2 COMMERCIAL FENCE FRAMING

A. Round Steel Pipe: High strength, SPS 40E, galvanized steel pipe by Stephens Pipe & Steel to meet the strength of 50,000 psi min. yield strength.

1. Line, End, Corner, and Pull Posts and Top Rail: Per requirements for Heavy Duty Commercial Fence. See Details for Sizes.

| 2. Pipe Size/Outside Diameter | Weight Lbs. Per Ft. |
|---|---|
| 1 5/8" | 1.84 |
| 2" | 2.28 |
| 2 ½" | 3.12 |
| 3" | 4.64 |
| 4" | 6.56 |

B. Top Rails: Fabricate top rail from lengths 21 feet and shall be coupled with a six (6) inch sleeve forming a continuous rail along top of chain-link fabric. Top rail to be one and five-eights (1-5/8") inch

C. Intermediate Rails: Match top rail for coating and strength and stiffness requirements.

D. Bottom Rails: Match top rail for coating and strength and stiffness requirements.

2.3 FITTINGS

A. General: Provide fittings for a complete fence installation, including special fittings for corners. Comply with ASTM F 626.

B. Post and Line Caps: Hot-dip galvanized pressed steel. Provide weathertight closure cap for each post.

C. Rail and Brace Ends: Hot-dip galvanized pressed steel. Provide rail ends or other means for attaching rails securely to each gate, corner, pull, and end post.

D. Rail Fittings: Provide the following:

1. Top Rail Sleeves: Hot-dip galvanized pressed steel. Not less than 6 inches long.
2. Rail Clamps: Hot-dip galvanized pressed steel. Provide line and corner boulevard clamps for connecting intermediate and bottom rails in the fence line to line posts.

E. Tension and Brace Bands: Hot-dip galvanized pressed 12 gauge pressed steel. Tension Bands spaced not to exceed 14" O.C. to secure tension bars to terminal posts. Bands shall have beveled edges. Brace Bands are to secure rail ends and truss rods to terminal posts. Bands shall have beveled edges.

F. Tension Bars: 5/8" wide x 3/16" thick steel. Provide on tension bar for each gate and end post, and two for each corner and pull post.

G. Tie Wires, Clips, and Fasteners: Provide the following types according to ASTM F 626:

1. Standard Round Wire Ties: For attaching chain-link fabric to posts, rails, and frames, complying with the following:
   a. Aluminum: ASTM B 211; alloy 1350-H19; #9 gauge 0.148-inch-diameter, mill-finished wire.

## 2.4 CAST-IN-PLACE CONCRETE

A. General: Comply with ACI 301 for cast-in-place concrete.

B. Materials: Portland cement complying with ASTM C 150, aggregates complying with ASTM C 33, and potable water for ready-mixed concrete complying with ASTM C 94.

1. Concrete Mixes: Normal-weight concrete with not less than 3000-psi compressive strength (28 days), 3-inch slump, and 1-inch maximum size aggregate.

## 2.5 POLYMER FINISHES

A. Supplemental Color Coating: In addition to specified metallic coatings for steel, provide fence components with polymer coating.

B. Metallic-Coated Steel Tension Wire: PVC-coated wire complying with ASTM F 1664, with a minimum 0.4 oz./sq. ft over metallic-coated steel wire.

C. Aluminum Framing: Comply with ASTM F 1043 for polymer coating applied to exterior surfaces and, except for tubular shapes, to exposed interior surfaces.

1. Polymer Coating: Not less than 10-mil- thick PVC or 3-mil -thick polyester finish.

D. Fittings, Post and Line Caps, Rail and Brace Ends, Top Rail Sleeves, Tie Wires, Clips, and Fasteners: Comply with ASTM F 626 for polymer coating applied to exterior surfaces and, except inside cap shapes, to exposed interior surfaces.

1. Polymer Coating: Not less than 10-mil- thick PVC.

E. Color: To match chain-link fabric, Black complying with ASTM F 934.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine areas and conditions, with Installer present, for compliance with requirements for site clearing, earthwork, pavement work, and other conditions affecting performance.

1. Do not begin installation before final grading is completed, unless otherwise permitted by Project Manager.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Stake locations of fence lines, and terminal posts. Do not exceed intervals of 50 feet or line of sight between stakes. Indicate locations of utilities, lawn sprinkler system, underground structures, benchmarks, and property monuments.

3.3 INSTALLATION, GENERAL

A. General: Install chain-link fencing to comply with ASTM F 567 and more stringent requirements specified.

1. Install fencing on established boundary lines inside property line.

B. Post Excavation: Machine-excavate holes for posts to diameters and spacings indicated, in firm, undisturbed or compacted soil. All holes are to be bell shaped, concrete monolithically poured. Belled holes 12" minimum at bottom of hole.

C. Post Setting: Machine-excavate holes for post foundations in firm, undisturbed or compacted soil. Set terminal and line posts in concrete footing. Protect portion of posts aboveground from concrete splatter. Place concrete around posts and vibrate or tamp for consolidation. Verify that posts are set plumb, aligned, and at correct height and spacing, and hold in position during placement and finishing operations until concrete is sufficiently cured.

1. Dimensions and Profile: As indicated on Drawings.
2. Concealed Concrete Footings: Stop footings below grade as indicated on Drawings to allow covering with surface material.
3. Posts Set into Concrete in Voids: Set in concrete footings, 4" below grade and back fill with spoils to grade. Concrete shall conform to standard ASTM C-94 3000 psi at 28 days.

3.4 CHAIN-LINK FENCE INSTALLATION

A. Terminal Posts: Locate terminal end and corner posts per ASTM F 567 and terminal pull posts at changes in horizontal or vertical alignment of 30 degrees or more.

B. Line Posts: Space line posts uniformly at 8 feet o.c.

C. Tension Wire: Install according to ASTM F 567, maintaining plumb position and alignment of fencing. Pull wire taut, without sags. Fasten to terminal posts with tension bars threaded through mesh and secured with tension bands at max. of 14" intervals. Tie to line posts and top rails with tie wires spaced at max. 12" on posts and 24" on rails.

D. Top Rail: Install according to ASTM F 567, maintaining plumb position and alignment of fencing. Run rail continuously through line post caps, bending to radius for curved runs and terminating into rail end attached to posts or post caps fabricated to receive rail at terminal posts. Provide expansion couplings as recommended by fencing manufacturer.

E. Intermediate Rails: Install in one piece at as indicated on Drawings, spanning between posts, using fittings, and accessories.

F. Bottom Rails: Install, spanning between posts, using fittings and accessories. One additional bottom rail to be added to backstop and backstop wings 12" from bottom rail on all panels using 1 5/8" O.D. pipe cut one piece from post to post and secured by boulevard clamps.

G. Chain-Link Fabric: Apply fabric to inside of enclosing framework. Leave 1 inch between finish grade or surface and bottom selvage, unless otherwise indicated. Pull fabric taut and tie to posts, rails, and tension wires. Anchor to framework so fabric remains under tension after pulling force is released.

H. Tension or Stretcher Bars: Thread through fabric and secure to end, corner, pull, and gate posts with tension bands spaced not more than 14 inches o.c.

I. Tie Wires: Use wire of proper length to firmly secure fabric to line posts and rails. Attach wire at one end to chain-link fabric, wrap wire around post a minimum of 180 degrees, and attach other end to chain-link fabric per ASTM F 626. Bend ends of wire to minimize hazard to individuals and clothing.

    1. Maximum Spacing: Tie fabric to line posts 12 inches o.c. and to braces 24 inches o.c.

J. Fasteners: Install nuts for tension bands and carriage bolts on the side of the fence opposite the fabric side.

END OF SECTION 02821

# SECTION 02870 - SITE AND STREET FURNISHINGS

## PART 1 - GENERAL

### 1.1 SUBMITTALS

A. Product Data: For each type of product indicated. Include construction details, material descriptions, dimensions of individual components and profiles, finishes, field-assembly requirements, and installation details.

B. Samples for Initial Selection: For units with factory-applied color finishes.

C. Samples for Verification: For each type of exposed finish required, prepared on Samples of size indicated below.

1. Size: Not less than 6-inch long linear components and 4-inch square sheet components.

D. Product Schedule: For site and street furnishings. Use same designations indicated on Drawings.

E. Material Certificates: For site and street furnishings, signed by manufacturers.

1. Recycled plastic.

F. Maintenance Data: For site and street furnishings to include in maintenance manuals.

## PART 2 - INSTALLATION

### 2.1 EXAMINATION

A. Examine areas and conditions, with Installer present, for compliance with requirements for correct and level finished grade, mounting surfaces, installation tolerances, and other conditions affecting performance.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

### 2.2 INSTALLATION, GENERAL

A. Comply with manufacturer's written installation instructions, unless more stringent requirements are indicated on plans. Complete field assembly of site

and street furnishings, where required. INSTALL ALL SAFETY INFORMATION ON EQUIPMENT PROVIDED BY MANUFACTURER.

B. Unless otherwise indicated, install site and street furnishings after landscaping and paving have been completed.

C. Install site and street furnishings level, plumb, true, and positioned at locations indicated on Drawings or approved locations by Owner.

D. Post Setting: Set cast-in support posts in concrete footing with smooth top, shaped to shed water. Protect portion of posts above footing from concrete splatter. Verify that posts are set plumb or at correct angle and are aligned and at correct height and spacing. Hold posts in position during placement and finishing operations until concrete is sufficiently cured.

E. Posts Set into Voids in Concrete: Form or core-drill holes for installing posts in concrete to depth recommended in writing by manufacturer of site and street furnishings and 3/4 inch (20 mm) larger than OD of post. Clean holes of loose material, insert posts, and fill annular space between post and concrete with non-shrink, nonmetallic grout or anchoring cement, mixed and placed to comply with anchoring material manufacturer's written instructions, with top smoothed and shaped to shed water. Install expansion joint per detail.

F. Pipe Sleeves: Use steel pipe sleeves preset and anchored into concrete for installing posts. After posts have been inserted into sleeves, fill annular space between post and sleeve with nonshrink, nonmetallic grout, or anchoring cement, mixed and placed to comply with anchoring material manufacturer's written instructions, with top smoothed and shaped to shed water. Install expansion joint per detail.

## 2.3 CLEANING

A. After completing site and street furnishing installation, inspect components. Remove spots, dirt, and debris. Repair damaged finishes to match original finish or replace component.

END OF SECTION 02870

# SECTION 02881 - PLAYGROUND EQUIPMENT AND STRUCTURES

## PART 1 - GENERAL

### 1.1 DEFINITIONS

A. Composite Play Structures: According to ASTM F 1487, this means "two or more play structures, attached or functionally linked," creating one integral unit with more than one play activity.

B. Critical Height: Standard measure of shock attenuation. According to CPSC No. 325, this means "the fall height below which a life-threatening head injury would not be expected to occur."

C. Fall Height: According to ASTM F 1487, this means "the vertical distance between a designated play surface and the protective surfacing beneath it." The fall height of playground equipment should not exceed the Critical Height of the protective surfacing beneath it.

D. HDPE: High-density polyethylene.

E. IPEMA: International Play Equipment Manufacturers Association.

F. LLDPE: Linear low-density polyethylene.

G. MDPE: Medium-density polyethylene.

H. Play Structure: According to ASTM F 1487, this is "a free-standing structure with one or more components and their supporting members."

I. Protective Surfacing: According to ASTM F 1487, this means impact-attenuating "materials to be used within the use zone of any playground equipment" for playground surface systems.

J. PVC: Polyvinyl chloride.

K. Transfer Point: According to ASTM F 1487, this is "a platform or deck along an accessible route of travel or an accessible platform provided to allow a child in a wheelchair to transfer from the chair onto the equipment."

L. Use Zone: According to ASTM F 1487, this is "the area beneath and immediately adjacent to a play structure that is designated for unrestricted circulation around the equipment and on whose surface it is predicted that a user would land when falling from or exiting the equipment."

1.2 QUALITY ASSURANCE

A. Installer Qualifications: An experienced installer who has specialized in installing work similar in material, design, and extent to that indicated for this Project and who is acceptable to manufacturer of playground equipment. Installer must be CPSI certified.

B. Manufacturer Qualifications: A firm whose playground equipment components have been certified by IPEMA's "3rd Party Certification" service.

1. Provide the following playground equipment and play structure components bearing the IPEMA Certification Seal:

a. Athens Park
1) BCI Burke

C. Standards and Guidelines: Provide playground equipment complying with or exceeding requirements in the following:

1. Current CPSI and ASTM guidelines and requirements.
2. CPSC No. 325, "Handbook for Public Playground Safety."
3. Label play structures with warning label and manufacturer's identification per ASTM.

1.3 PROJECT CONDITIONS

A. Existing Utilities: Do not interrupt utilities serving facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary utility services according to requirements indicated:

1. Notify Owner at least two days in advance of proposed utility interruptions.
2. Do not proceed with utility interruptions without Owner's written permission.
3. Before excavating, contact utility-locator service for area where Project is located.

1.4 COORDINATION

A. Coordinate construction of equipment use zones and fall heights during installation of playground equipment with installation of protective surfacing specified in Division 2 Section "Playground Surface Systems." Sequence work so protective surfacing can be installed immediately after concrete footings have set.

PART 2 - EXECUTION

2.1 EXAMINATION

A. Examine areas and conditions, with Installer present, for compliance with requirements for site clearing, earthwork, site surface and sub-grade drainage, and other conditions affecting performance.

1. Do not begin installation before final grading required for placing protective surfacing is completed, unless otherwise permitted by Owner.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

2.2 PREPARATION

A. Verify locations of playground perimeter and pathways. Verify that playground layout and equipment locations comply with requirements for each type and component of equipment.

2.3 INSTALLATION, GENERAL

A. General: Comply with manufacturer's written installation instructions, ASTM & CPSC materials unless more stringent requirements are indicated. Anchor playground equipment securely, positioned at locations and elevations indicated on Shop Drawings.

1. Maximum Equipment Height: Coordinate installed heights of equipment and components with installation of protective surfacing. Set equipment so fall heights and elevation requirements for age group use and accessibility are within required limits. Verify that playground equipment elevations comply with requirements for each type and component of equipment.

B. Post and Footing Excavation: Hand-excavate holes for posts and footings to dimensions, profile, spacings, and in locations indicated on Drawings, in firm, undisturbed or compacted subgrade soil. Level bearing surfaces with drainage fill to required elevation.

C. Post Setting: Set main-frame equipment posts in concrete footing. Protect portion of posts above footing from concrete splatter. Place concrete around posts and vibrate or tamp for consolidation. Verify that posts are set plumb or at the correct angle and are aligned and at the correct height and spacing. Hold posts in position during placement and finishing operations until concrete is sufficiently cured.

1. Concrete Footings: Smooth top, and shape to shed water.

2.4 FIELD QUALITY CONTROL

A. Arrange for playground equipment manufacturer's technical personnel to inspect playground and playground equipment and component at final completion and to certify compliance with the following:

1. Current ASTM materials.
2. CPSC No. 325.

B. Notify Owner 48 hours in advance of date and time of final inspection.

2.5 ADJUSTING

A. Adjust movable playground equipment components to operate smoothly, easily, and quietly, free from binding, warp, distortion, nonalignment, misplacement, disruption, or malfunction, throughout entire operational range.

2.6 CLEANING

A. After completing playground equipment installation, inspect components. INSTALL ALL SAFETY INFORMATION ON EQUIPMENT PROVIDED BY MANUFACTURER. Remove spots, dirt, and debris and power wash clean. Repair damaged finishes to match original finish or replace component.

END OF SECTION 02881

# SECTION 02920 - TURF AND GRASSES

## 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. This Section includes the following:

1. Seeding.
2. Prairie/Native Seeding.

B. Related Sections include the following:

1. Division 2 Section "Site Clearing" for topsoil stripping and stockpiling.
2. Division 2 Section "Earthwork" for excavation, filling and backfilling, and rough grading.

### 1.3 DEFINITIONS

A. Finish Grade: Elevation of finished surface of planting soil.

B. Manufactured Soil: Soil produced off-site by homogeneously blending mineral soils or sand with stabilized organic soil amendments to produce topsoil or planting soil.

C. Planting Soil: Native or imported topsoil, manufactured topsoil, or surface soil modified to become topsoil; mixed with soil amendments.

D. Subgrade: Surface or elevation of subsoil remaining after completing excavation, or top surface of a fill or backfill immediately beneath planting soil.

### 1.4 SUBMITTALS

A. Product Data: For each type of product indicated.

B. Certification of Grass Seed: From seed vendor for each grass-seed monostand or mixture stating the botanical and common name and percentage by weight of each species and variety, and percentage of purity, germination, and weed seed. Include the year of production and date of packaging.

1. Certification of each seed mixture for turfgrass and prairie, identifying source, including name and telephone number of supplier.

C. Product Certificates: For fertilizers, by product manufacturer.

D. Qualification Data: For landscape Installer.

E. Material Test Reports: For existing surface soil and imported topsoil.

F. Planting Schedule: Indicating anticipated planting dates for each type of planting.

## 1.5 QUALITY ASSURANCE

A. Installer Qualifications: A qualified landscape installer whose work has resulted in successful lawn and prairie establishment.

1. Installer's Field Supervision: Require Installer to maintain an experienced full-time supervisor that can clearly communicate and provide understanding to all interested parties on Project site when planting is in progress.

B. Soil-Testing Laboratory Qualifications: An independent laboratory, recognized by the State Department of Agriculture, with the experience and capability to conduct the testing indicated and that specializes in types of tests to be performed.

C. Topsoil Analysis: Furnish soil analysis by a qualified soil-testing laboratory stating percentages of organic matter; gradation of sand, silt, and clay content; cation exchange capacity; deleterious material; pH; and mineral and plant-nutrient content of topsoil.

1. Report suitability of topsoil for lawn growth. State recommended quantities of nitrogen, phosphorus, and potash nutrients and soil amendments to be added to produce a satisfactory topsoil.

Pre-installation Conference: Conduct conference at Project site to comply with requirements.

## 1.6 DELIVERY, STORAGE, AND HANDLING

A. Seed: Deliver seed in original sealed, labeled, and undamaged containers.

1.7 SCHEDULING

A. Planting Restrictions: Plant during one of the following periods. Coordinate planting periods with maintenance periods to provide required maintenance from date of Substantial Completion.

1. Planting for Seed: 4/1 – 6/1 & 8/16 – 10/15

B. Weather Limitations: Proceed with planting only when existing and forecasted weather conditions permit.

1.8 LAWN MAINTENANCE

A. Begin maintenance immediately after each area is planted and continue until acceptable lawn is established, but for not less than the following periods:

1. Seeded Lawns: 60 days from date of Substantial Completion.

a. When full maintenance period has not elapsed before end of planting season, or if lawn is not fully established, continue maintenance during next planting season.

B. Maintain and establish lawn by watering, fertilizing, weeding, mowing, trimming, replanting, and other operations. Roll, regrade, and replant bare or eroded areas and remulch to produce a uniformly smooth lawn.

1. In areas where mulch has been disturbed by wind or maintenance operations, add new mulch. Anchor as required to prevent displacement.

C. Watering: Provide all water and maintain temporary piping, hoses, and lawn-watering equipment to convey water from sources and to keep lawn uniformly moist to a depth of 4 inches.

1. Schedule watering to prevent wilting, puddling, erosion, and displacement of seed or mulch. Lay out temporary watering system to avoid walking over muddy or newly planted areas.
2. Water lawn at a minimum rate of 1 inch per week.

D. Mow lawn as soon as top growth is tall enough to cut. Repeat mowing to maintain specified height without cutting more than 40 percent of grass height. Remove no more than 40 percent of grass-leaf growth in initial or subsequent mowings. Do not delay mowing until grass blades bend over and become matted. Do not mow when grass is wet. Schedule initial and subsequent mowings to maintain the following grass height:

1. Mow lawn grass 2 inches high.

E. Lawn Postfertilization: Apply fertilizer after initial mowing and when grass is dry.

1. Uniformly distribute fertilizer by mechanical means at the rate of 20 pounds per 1000 sq. ft.

2. Schedule watering to prevent wilting, puddling, erosion, and displacement of seed or mulch. Lay out temporary watering system to avoid walking over muddy or newly planted areas.
3. Water prairie at a minimum rate of 1/2 inch per week for 8 weeks after planting.

1.9 PRAIRIE/NATIVE SEED MAINTENANCE

A. Begin maintenance immediately after each area is planted and continue until acceptable prairie is established, but for not less than 30 days from date of Substantial Completion.

B. Maintain and establish prairie by watering, weeding, mowing, trimming, replanting, and other operations. Roll, regrade, and re-hydroseed bare or eroded areas.

C. Watering: Provide and maintain temporary piping, hoses, and lawn-watering equipment to convey water from sources and to keep meadow uniformly moist.

1. Schedule watering to prevent wilting, puddling, erosion, and displacement of seed or mulch. Lay out temporary watering system to avoid walking over muddy or newly planted areas.
2. Water prairie at a minimum rate of 1/2 inch per week for 8 weeks after planting.

PART 2 - PRODUCTS

2.1 TURFGRASS SEED

A. Grass Seed: Fresh, clean, dry, new-crop seed complying with AOSA's "Journal of Seed Technology; Rules for Testing Seeds" for purity and germination tolerances.

A. Seed Species: Seed can be obtained at Conser FS (630) 963-8787.

1. SEED: Seed of grass species shall be Legend Elite Sport ProNitro Plus Seed or Equal. The mix is to be applied at a rate of 600 lbs/acre.

B. Ground Stabilization Geotextile: Woven geotextile fabric, manufactured for ground stabilization applications (General seed application).

1. Products: ECS-1B Single Net Biodegradable Blanket by East Coast Erosion Control Blankets 1-800-582-4005, or Equal. Color: Natural

## 2.2 PRAIRIE/NATIVE SEED

A. Native Grass Seed: Fresh, clean, dry, new seed, mixed species from Stantec Native Plant Nursery 574-586-2412 or Martenson Turf Products 1-800-833-2290 or Equal as follows:

1. PRA1: Midwest Mesic Pollinator Mix. Apply at a rate of 39.00 lbs/acre.

2. PRA2: Swale Seed Mix. Apply at a rate of 37.00 lbs/acre.

3. PRA3: Low Profile Prairie Seed Mix. Apply at a rate of 42.00 lbs/acre.

4. PRA4: No Mow Fescue Seed Mix. Apply at a rate of 400.00 lbs/acre.

5. PRA5: Upland Transitional Zone Seed Mix. Apply at a rate of 57.00 oz/acre.

6. PRA6: Wetland Zone A Seed Mix. Apply at a rate of 31.00 oz/acre.

7. PRA7: Wetland Zone B Seed Mix. Apply at a rate of 24.00 oz/acre.

8. PRA8: Wetland Zone C Seed Mix. Apply at a rate of 48.00 oz/acre.

9. PRA9: Custom Forest Seed Mix Seed Mix. Apply at a rate of 48.00 oz/acre.

B. Ground Stabilization Geotextile: Woven geotextile fabric, manuf0actured for ground stabilization applications (Native seed application)

1. Products: ECS-2B Double Net Biodegradable Blanket by East Coast Erosion Control Blankets 1-800-582-4005, or Equal. Color: Natural

## 2.3 GENERAL TOPSOIL

A. Topsoil: ASTM D 5268, pH range of 5.5 to 7, a minimum of 4 percent organic material content; free of stones 1 inch or larger in any dimension and other extraneous materials harmful to plant growth.

1. Topsoil Source: Reuse surface soil stockpiled on-site. Verify suitability of stockpiled surface soil to produce topsoil. Clean surface soil of roots, plants, sod, stones, clay lumps, and other extraneous materials harmful to plant growth.

a. Supplement with imported topsoil from off-site sources when quantities are insufficient.

## 2.4 INORGANIC SOIL AMENDMENTS

B. Lime: ASTM C 602, agricultural limestone containing a minimum 80 percent calcium carbonate equivalent and as follows:
   1. Class: Class O, with a minimum 95 percent passing through No. 8 sieve and a minimum 55 percent passing through No. 60 sieve.

C. Iron Sulfate: Granulated ferrous sulfate containing a minimum of 20 percent iron and 10 percent sulfur.

D. Perlite: Horticultural perlite, soil amendment grade.

E. Agricultural Gypsum: Finely ground, containing a minimum of 90 percent calcium sulfate.

F. Sand: Clean, washed, natural or manufactured, free of toxic materials.

## 2.5 ORGANIC SOIL AMENDMENTS

G. Compost: Well-composted, stable, and weed-free organic matter, pH range of 5.5 to 8; moisture content 35 to 55 percent by weight; 100 percent passing through 1-inch sieve; soluble salt content of 5 to 10 decisiemens/m; not exceeding 0.5 percent inert contaminants and free of substances toxic to plantings; and as follows:

   1. Organic Matter Content: 50 to 60 percent of dry weight.

H. Peat: Sphagnum peat moss, partially decomposed, finely divided or granular texture, with a pH range of 3.4 to 4.8.

I. Peat: Finely divided or granular texture, with a pH range of 6 to 7.5, containing partially decomposed moss peat, native peat, or reed-sedge peat and having a water-absorbing capacity of 1100 to 2000 percent.

J. Manure: Well-rotted, unleached, stable or cattle manure containing not more than 25 percent by volume of straw, sawdust, or other bedding materials; free of toxic substances, stones, sticks, soil, weed seed, and material harmful to plant growth.

## 2.6 PLANTING ACCESSORIES

A. Selective Herbicides: EPA registered and approved, of type recommended by manufacturer for application for site conditions and approved by landscape architect.

## 2.7 FERTILIZER

A. Slow-Release Fertilizer: Granular or pelleted fertilizer consisting of 50 percent water-insoluble nitrogen, phosphorus, and potassium in the following composition:

1. Composition: 20 percent nitrogen, 10 percent phosphorous, and 10 percent potassium, by weight.

2.8 PLANTING SOIL MIX

A. Planting Soil Mix: Mix topsoil with the following soil amendments and fertilizers in the following quantities:

1. Contractor to amend imported topsoil to produce satisfactory planting soil, depending on soil tests of imported or manufactured soils.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine areas to receive lawns and grass for compliance with requirements and other conditions affecting performance. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Protect structures, utilities, sidewalks, pavements, and other facilities, trees, shrubs, and plantings from damage caused by planting operations.

B. Provide erosion-control measures to prevent erosion or displacement of soils and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways.

3.3 LAWN PREPARATION

A. Limit lawn subgrade preparation to areas to be planted.

B. Newly Graded Subgrades: Loosen subgrade to a minimum depth of 8 inches. Remove stones larger than 1 inch in any dimension and sticks, roots, rubbish, and other extraneous matter and legally dispose of them off Owner's property.

1 Apply slow release fertilizer directly to subgrade before loosening.

2. Thoroughly blend planting soil mix by spread topsoil, apply soil amendments and fertilizer on surface, and thoroughly blend planting soil mix.

    a. Delay mixing fertilizer with planting soil if planting will not proceed within a few days.
    b. Mix lime with dry soil before mixing fertilizer as needed.

3. Spread planting soil mix to a max. depth of 6 inches but not less than required to meet finish grades after light rolling and natural settlement. Do not spread if planting soil or subgrade is frozen, muddy, or excessively wet.

    a. Mix thoroughly into top 4 inches of subgrade. Spread remainder of planting soil mix.

C. Unchanged Subgrades: If lawns are to be planted in areas unaltered or undisturbed by excavating, grading, or surface soil stripping operations, prepare surface soil as follows:

1. Remove existing grass, vegetation, and turf. Do not mix into surface soil.
2. Loosen surface soil to a depth of at least of 4 inches. Apply soil amendments and fertilizers according to planting soil mix proportions and mix thoroughly into top 2 inches of soil. Till soil to a homogeneous mixture of fine texture.

    a. Apply slow release fertilizer directly to surface soil before loosening.

3. Remove stones larger than 1 inch in any dimension and sticks, roots, trash, and other extraneous matter.
4. Legally dispose of waste material, including grass, vegetation, and turf, off Owner's property.

D. Finish Grading: Grade planting areas to a smooth, uniform surface plane with loose, uniformly fine texture. Grade to within plus or minus 1/2 inch of finish elevation. Roll and rake, remove ridges, and fill depressions to meet finish grades. Limit fine grading to areas that can be planted in the immediate future.

E. Apply herbicide treatment to entire project construction area before excavation.

F. Moisten prepared lawn areas before planting if soil is dry. Water thoroughly and allow surface to dry before planting. Do not create muddy soil.

G. Restore areas if eroded or otherwise disturbed after finish grading and before planting.

3.4 SEEDING

A. Do not perform seeding in windy conditions.

B. Seeding shall be dispersed in 2 directions at right angles to each other.

C. Permanently seed and mulch cut and fill slopes as construction proceeds to extent considered desirable and practical.

D. Seed lawn areas by sowing evenly with approved mechanical seeder at rate of minimum of 300 pounds per acre. Culti-packer or approved similar equipment may be used to cover seed and to form seedbed in one operation. In areas inaccessible to culti-packer, lightly rake seeded ground with flexible rakes and roll with water ballast roller. After seeding, apply erosion control blanket.

E. Surface layer of soil for seeded areas shall be kept moist during germination period. Water seeded areas twice first week to minimum depth of 6 inches with fine spray and once per week thereafter as necessary to supplement natural rain to equivalent of 6 inches depth.

## 3.5 SATISFACTORY LAWNS

A. Satisfactory Seeded Lawn: At end of maintenance period, a healthy, uniform, close stand of grass has been established, free of weeds and surface irregularities, with coverage exceeding 90 percent over any 10 sq. ft. and bare spots not exceeding 5 by 5 inches.

B. Satisfactory Sodded Lawn: At end of maintenance period, a healthy, well-rooted, even-colored, viable lawn has been established, free of weeds, open joints, bare areas, and surface irregularities.

C. Reestablish lawns that do not comply with requirements and continue maintenance until lawns are satisfactory.

## 3.6 CLEANUP AND PROTECTION

A. Promptly remove soil and debris created by lawn work from paved areas. Clean wheels of vehicles before leaving site to avoid tracking soil onto roads, walks, or other paved areas.

B. Erect barricades and warning signs as required to protect newly planted areas from traffic. Maintain barricades throughout maintenance period and remove after lawn is established.

C. Remove erosion-control measures after grass establishment period.

END OF SECTION 02920

# SECTION 02930 - EXTERIOR PLANTS

## 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. This Section includes the following:

1. Trees
2. Shrubs
3. Ground cover
4. Plants
5. Edgings

B. Related Sections include the following:

1. Division 2 Section "Site Clearing" for protection of existing trees and planting, topsoil stripping and stockpiling, and site clearing.
2. Division 2 Section "Earthwork" for excavation, filling, and rough grading and for subsurface aggregate drainage and drainage backfill materials.

### 1.3 DEFINITIONS

A. Balled and Burlapped Stock: Exterior plants dug with firm, natural balls of earth in which they are grown, with ball size not less than diameter and depth recommended by ANSI Z60.1 for type and size of tree or shrub required; wrapped, tied, rigidly supported, and drum-laced as recommended by ANSI Z60.1.

B. Container-Grown Stock: Healthy, vigorous, well-rooted exterior plants grown in a container with well-established root system reaching sides of container and maintaining a firm ball when removed from container. Container shall be rigid enough to hold ball shape and protect root mass during shipping and be sized according to ANSI Z60.1 for kind, type, and size of exterior plant required.

C. Finish Grade: Elevation of finished surface of planting soil.

D. Manufactured Topsoil: Soil produced off-site by homogeneously blending mineral soils or sand with stabilized organic soil amendments to produce topsoil or planting soil.

E. Planting Soil: Native or imported topsoil, manufactured topsoil, or surface soil modified to become topsoil; mixed with soil amendments.

F. Subgrade: Surface or elevation of subsoil remaining after completing excavation, or top surface of a fill or backfill, before placing planting soil.

## 1.4 SUBMITTALS

A. Product Data: For each type of product indicated.

B. Material Test Reports: For existing surface soil and imported topsoil.

C. Planting Schedule: Indicating anticipated planting dates for exterior plants.

D. Maintenance Instructions: Recommended procedures to be established by Owner for maintenance of exterior plants during a calendar year. Submit before expiration of required maintenance periods.

## 1.5 QUALITY ASSURANCE

A. Installer Qualifications: A qualified landscape installer whose work has resulted in successful establishment of exterior plants.

1. Installer's Field Supervision: Require Installer to maintain an experienced full-time supervisor that can clearly communicate and provide understanding to all interested parties on Project site when planting is in progress.

B. Soil-Testing Laboratory Qualifications: An independent laboratory, recognized by the State Department of Agriculture, with the experience and capability to conduct the testing indicated and that specializes in types of tests to be performed.

C. Topsoil Analysis: Furnish soil analysis by a qualified soil-testing laboratory stating percentages of organic matter; gradation of sand, silt, and clay content; cation exchange capacity; deleterious material; pH; and mineral and plant-nutrient content of topsoil.

1. Report suitability of topsoil for plant growth. State recommended quantities of nitrogen, phosphorus, and potash nutrients and soil amendments to be added to produce a satisfactory topsoil.

D. Provide quality, size, genus, species, and variety of exterior plants indicated, complying with applicable requirements in ANSI Z60.1, "American Standard for Nursery Stock."

1. Selection of exterior plants purchased under allowances will be made by Architect, who will tag plants at their place of growth before they are prepared for transplanting.

E. Tree and Shrub Measurements: Measure according to ANSI Z60.1 with branches and trunks or canes in their normal position. Do not prune to obtain required sizes. Take caliper measurements 6 inches (150 mm) above ground for trees up to 4-inch (100-mm) caliper size, and 12 inches (300 mm) above ground for larger sizes. Measure main body of tree or shrub for height and spread; do not measure branches or roots tip-to-tip.

F. Observation: Project Manager may observe trees and shrubs either at place of growth or at site before planting for compliance with requirements for genus, species, variety, size, and quality. Architect retains right to observe trees and shrubs further for size and condition of balls and root systems, insects, injuries, and latent defects and to reject unsatisfactory or defective material at any time during progress of work. Remove rejected trees or shrubs immediately from Project site.

1. Notify Project Manager of sources of planting materials 14 days in advance of delivery to site.

G. Pre-installation Conference: Conduct conference at Project site to comply with requirements in Division 1 Section "Project Management and Coordination."

1.6 DELIVERY, STORAGE, AND HANDLING

A. Deliver exterior plants freshly dug.

1. Immediately after digging up bare-root stock, pack root system in wet straw, hay, or other suitable material to keep root system moist until planting.

B. Do not prune trees and shrubs before delivery, except as approved by Architect. Protect bark, branches, and root systems from sun scald, drying, sweating, whipping, and other handling and tying damage. Do not bend or bind-tie trees or shrubs in such a manner as to destroy their natural shape. Provide protective covering of exterior plants during delivery. Do not drop exterior plants during delivery.

C. Handle planting stock by root ball.

D. Deliver exterior plants after preparations for planting have been completed and install immediately. If planting is delayed more than six hours after delivery, set exterior plants trees in shade, protect from weather and mechanical damage, and keep roots moist.

1. Heel-in bare-root stock. Soak roots in water for two hours if dried out.
2. Set balled stock on ground and cover ball with soil, peat moss, sawdust, or other acceptable material.
3. Do not remove container-grown stock from containers before time of planting.
4. Water root systems of exterior plants stored on-site with a fine-mist spray. Water as often as necessary to maintain root systems in a moist condition.

## 1.7 COORDINATION

A. Planting Restrictions: Plant during one of the following periods. Coordinate planting periods with maintenance periods to provide required maintenance from date of Substantial Completion.

1. Spring Planting: 4/1 – 6/15
2. Fall Planting: 9/1 – 11/1

B. Weather Limitations: Proceed with planting only when existing and forecasted weather conditions permit.

C. Coordination with Lawns: Plant trees and shrubs after finish grades are established and before planting lawns, unless otherwise acceptable to Architect.

1. When planting trees and shrubs after lawns, protect lawn areas and promptly repair damage caused by planting operations.

## 1.8 WARRANTY

A. Special Warranty: Warrant the following exterior plants, for the warranty period indicated, against defects including death and unsatisfactory growth, except for defects resulting from lack of adequate maintenance, neglect, or abuse by Owner, or incidents that are beyond Contractor's control.

1. Warranty Period for Trees and Shrubs: One year from date of Substantial Completion.
2. Warranty Period for Ground Cover and Plants: One year from date of Substantial Completion.
3. Remove dead exterior plants immediately. Replace immediately unless required to plant in the succeeding planting season.
4. Replace exterior plants that are more than 25 percent dead or in an unhealthy condition at end of warranty period.

5. A limit of one replacement of each exterior plant will be required, except for losses or replacements due to failure to comply with requirements.

1.9 MAINTENANCE

A. Trees and Shrubs: Maintain for the following maintenance period by pruning, cultivating, watering, weeding, fertilizing, restoring planting saucers, tightening and repairing stakes and guy supports, and resetting to proper grades or vertical position, as required to establish healthy, viable plantings. Spray as required to keep trees and shrubs free of insects and disease. Restore or replace damaged tree wrappings.

1. Maintenance Period: 30 days from date of Substantial Completion.

B. Ground Cover and Plants: Maintain for the following maintenance period by watering, weeding, fertilizing, and other operations as required to establish healthy, viable plantings:

1. Maintenance Period: 30 days from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 TREE AND SHRUB MATERIAL

A. General: Furnish nursery-grown trees and shrubs complying with ANSI Z60.1, with healthy root systems developed by transplanting or root pruning. Provide well-shaped, fully branched, healthy, vigorous stock free of disease, insects, eggs, larvae, and defects such as knots, sun scald, injuries, abrasions, and disfigurement.

B. Grade: Provide trees and shrubs of sizes and grades complying with ANSI Z60.1 for type of trees and shrubs required. Trees and shrubs of a larger size may be used if acceptable to Project Manager, with a proportionate increase in size of roots or balls.

C. Label each tree and shrub with securely attached, waterproof tag bearing legible designation of botanical and common name.

D. Label at least one tree and one shrub of each variety and caliper with a securely attached, waterproof tag bearing legible designation of botanical and common name.

E. If formal arrangements or consecutive order of trees or shrubs is shown, select stock for uniform height and spread, and number label to assure symmetry in planting.

## 2.2 SHADE AND ORNAMENTAL TREES

A. Shade Trees: Single-stem trees with straight trunk, well-balanced crown, and intact leader, of height and caliper indicated, complying with ANSI Z60.1 for type of trees required.

1. Provide balled and burlapped trees.
2. Branching Height: One-third to one-half of tree height.

B. Flowering Trees: Branched or pruned naturally according to species and type, with relationship of caliper, height, and branching according to ANSI Z60.1; stem form as follows:

1. Stem Form: Single stem, Multistem, clump with two or more main stems.
2. Provide balled and burlapped trees.

## 2.3 EVERGREENS

A. Form and Size: Normal-quality, well-balanced, evergreens, of type, height, spread, and shape required, complying with ANSI Z60.1.

1. Provide container-grown shrubs.

## 2.4 GROUND COVER PLANTS

A. Ground Cover: Provide ground cover of species indicated, established and well rooted in pots or similar containers, and complying with ANSI Z60.1.

## 2.5 PLANTS

A. Annuals: Provide healthy, disease-free plants of species and variety shown or listed. Provide only plants that are acclimated to outdoor conditions before delivery and that are in bud but not yet in bloom.

B. Perennials: Provide healthy, field-grown plants from a commercial nursery, of species and variety shown or listed.

## 2.6 TOPSOIL

A. Topsoil: ASTM D 5268, pH range of 5.5 to 7, a minimum of 4 percent organic material content; free of stones 1 inch (25 mm) or larger in any dimension and other extraneous materials harmful to plant growth.

1. Topsoil Source: Reuse surface soil stockpiled on-site. Verify suitability of stockpiled surface soil to produce topsoil. Clean surface soil of roots,

plants, sod, stones, clay lumps, and other extraneous materials harmful to plant growth.

a. Supplement with imported topsoil from off-site sources when quantities are insufficient. Obtain topsoil displaced from naturally well-drained construction or mining sites where topsoil occurs at least 4 inches (100 mm) deep; do not obtain from bogs or marshes.

## 2.7 INORGANIC SOIL AMENDMENTS

A. Lime: ASTM C 602, agricultural limestone containing a minimum 80 percent calcium carbonate equivalent and as follows:
   1. Class: Class O, with a minimum 95 percent passing through No. 8 (2.36-mm) sieve and a minimum 55 percent passing through No. 60 (0.25-mm) sieve.

B. Sulfur: Granular, biodegradable, containing a minimum of 90 percent sulfur, with a minimum 99 percent passing through No. 6 (3.35-mm) sieve and a maximum 10 percent passing through No. 40 (0.425-mm) sieve.

C. Iron Sulfate: Granulated ferrous sulfate containing a minimum of 20 percent iron and 10 percent sulfur.

D. Aluminum Sulfate: Commercial grade, unadulterated.

E. Perlite: Horticultural perlite, soil amendment grade.

F. Agricultural Gypsum: Finely ground, containing a minimum of 90 percent calcium sulfate.

G. Sand: Clean, washed, natural or manufactured, free of toxic materials.

## 2.8 ORGANIC SOIL AMENDMENTS

A. Compost: Well-composted, stable, and weed-free organic matter, pH range of 5.5 to 8; moisture content 35 to 55 percent by weight; 100 percent passing through 1-inch sieve; soluble salt content of 5 to 10 decisiemens/m; not exceeding 0.5 percent inert contaminants and free of substances toxic to plantings; and as follows:

   1. Organic Matter Content: 50 to 60 percent of dry weight.

B. Peat: Sphagnum peat moss, partially decomposed, finely divided or granular texture, with a pH range of 3.4 to 4.8.

C. Peat: Finely divided or granular texture, with a pH range of 6 to 7.5, containing partially decomposed moss peat, native peat, or reed-sedge peat and having a water-absorbing capacity of 1100 to 2000 percent.

D. Manure: Well-rotted, unleached, stable or cattle manure containing not more than 25 percent by volume of straw, sawdust, or other bedding materials; free of toxic substances, stones, sticks, soil, weed seed, and material harmful to plant growth.

## 2.9 FERTILIZER

A. Slow-Release Fertilizer: Granular or pelleted fertilizer consisting of 50 percent water-insoluble nitrogen, phosphorus, and potassium in the following composition:

1. Composition: 10 percent nitrogen, 10 percent phosphorous, and 10 percent potassium, by weight or in amounts recommended in soil reports from a qualified soil-testing agency.

## 2.10 MULCHES

A. Organic Mulch: Free from deleterious materials and suitable as a top dressing of trees and shrubs, consisting of one of the following:

1. Type: Shredded hardwood

## 2.11 PLANTING SOIL MIX

A. Planting Soil Mix: Mix topsoil with the following soil amendments in the following quantities:

1. Ratio of Loose Compost to Topsoil by Volume: 1:4

# PART 3 - EXECUTION

## 3.1 EXAMINATION

A. Examine areas to receive exterior plants for compliance with requirements and conditions affecting installation and performance. Proceed with installation only after unsatisfactory conditions have been corrected.

## 3.2 PREPARATION

A. Protect structures, utilities, sidewalks, pavements, and other facilities, and lawns and existing exterior plants from damage caused by planting operations.

B. Provide erosion-control measures to prevent erosion or displacement of soils and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways.

C. Lay out individual tree and shrub locations and areas for multiple exterior plantings. Stake locations, outline areas, adjust locations when requested, and obtain Project Manager's acceptance of layout before planting. Make minor adjustments as required.

## 3.3 PLANTING BED ESTABLISHMENT

A. Loosen subgrade of planting beds to a minimum depth of 8 inches. Remove stones larger than 1 inch in any dimension and sticks, roots, rubbish, and other extraneous matter and legally dispose of them off Owner's property.

1. Apply soil amendments and fertilizer on surface, and thoroughly blend planting soil mix.

    a. Delay mixing fertilizer with planting soil if planting will not proceed within a few days.

2. Spread planting soil mix to a depth of 8 inches but not less than required to meet finish grades after natural settlement. Do not spread if planting soil or subgrade is frozen, muddy, or excessively wet.

    a. Spread approximately one-half the thickness of planting soil mix over loosened subgrade. Mix thoroughly into top 4 inches of subgrade. Spread remainder of planting soil mix.

B. Finish Grading: Grade planting beds to a smooth, uniform surface plane with loose, uniformly fine texture. Roll and rake, remove ridges, and fill depressions to meet finish grades.

C. Restore planting beds if eroded or otherwise disturbed after finish grading and before planting.

## 3.4 TREE AND SHRUB EXCAVATION

A. Pits and Trenches: Excavate circular pits with sides sloped inward. Trim base leaving center area raised slightly to support root ball and assist in drainage.

Do not further disturb base. Scarify sides of plant pit smeared or smoothed during excavation.

1. Excavate approximately three times as wide as ball diameter for balled and burlapped stock.
2. If drain tile is shown or required under planted areas, excavate to top of porous backfill over tile.

B. Subsoil removed from excavations may be used as backfill.

C. Obstructions: Notify Project Manager if unexpected rock or obstructions detrimental to trees or shrubs are encountered in excavations.

D. Drainage: Notify Project Manager if subsoil conditions evidence unexpected water seepage or retention in tree pits.

## 3.5 TREE AND SHRUB PLANTING

A. Set balled and burlapped stock plumb and in center of pit or trench with top of root ball flush with adjacent finish grades.

1. Remove burlap and wire baskets from tops of root balls and partially from sides, but do not remove from under root balls. Remove pallets, if any, before setting. Do not use planting stock if root ball is cracked or broken before or during planting operation.

2. Place planting soil mix around root ball in layers, tamping to settle mix and eliminate voids and air pockets. When pit is approximately one-half backfilled, water thoroughly before placing remainder of backfill. Repeat watering until no more water is absorbed. Water again after placing and tamping final layer of planting soil mix. THE COST OF WATERING (AND ALL RELATED ACTIVITES) SHALL BE INCLUDED IN THE BASE BID AMOUNT.

B. Organic Mulching: Apply min. 3" average thickness of organic mulch extending within the spade edge planting ring set at a 3' radius from the trunk of the specimen. Do not place mulch within 3 inches of trunks or stems.

C. Wrap trees of 2-inch (50-mm) caliper and larger with trunk-wrap tape. Start at base of trunk and spiral cover trunk to height of first branches. Overlap wrap, exposing half the width, and securely attach without causing girdling. Inspect tree trunks for injury, improper pruning, and insect infestation; take corrective measures required before wrapping.

3.6 TREE AND SHRUB PRUNING

A. Prune, thin, and shape trees and shrubs as directed by Project Manager.

B. Prune, thin, and shape trees and shrubs according to standard horticultural practice. Prune trees to retain required height and spread. Unless otherwise indicated by Project Manager, do not cut tree leaders; remove only injured or dead branches from flowering trees. Prune shrubs to retain natural character. Shrub sizes indicated are sizes after pruning.

3.7 GUYING AND STAKING

A. Upright Staking and Tying: Stake all trees of 2- through 5-inch caliper. Stake trees of less than 2-inch (50-mm) caliper only as required to prevent wind tip-out. Use a minimum of 2 stakes of length required to penetrate at least 18 inches below bottom of backfilled excavation and to extend at least 3 inches above grade. Set vertical stakes and space to avoid penetrating root balls or root masses. Support trees with three strands of ArborTie by DEEPROOT, a polypropylene material with 900 lbs. of test strength. (See Detail). Allow enough slack to avoid rigid restraint of tree. Use the number of stakes as follows:

1. Use 3 stakes for all trees except designated ornamentals by the Project Manager. Space stakes equally around trees.

3.8 GROUND COVER AND PLANT PLANTING

A. Set out and space ground cover and plants as indicated.

B. Dig holes large enough to allow spreading of roots, and backfill with planting soil.

C. Work soil around roots to eliminate air pockets and leave a slight saucer indentation around plants to hold water.

D. Water thoroughly after planting, taking care not to cover plant crowns with wet soil. THE COST OF WATERING (AND ALL RELATED ACTIVITES) SHALL BE INCLUDED IN THE BASE BID AMOUNT.

E. Protect plants from hot sun and wind; remove protection if plants show evidence of recovery from transplanting shock.

3.9 PLANTING BED MULCHING

A. Completely cover area to be mulched, overlapping edges a minimum of 6 inches (150 mm).

B. Mulch backfilled surfaces of planting beds and other areas indicated.

1. Organic Mulch: Apply 3 inches average thickness of organic mulch, and finish level with adjacent finish grades. Do not place mulch against plant stems.

## 3.10 EDGING INSTALLATION

A. Spade/Trench Edging: (See Detail).

## 3.11 CLEANUP AND PROTECTION

A. During exterior planting, keep adjacent pavings and construction clean and work area in an orderly condition.

B. Protect exterior plants from damage due to landscape operations, operations by other contractors and trades, and others. Maintain protection during installation and maintenance periods. Treat, repair, or replace damaged exterior planting.

## 3.12 DISPOSAL

A. Disposal: Remove surplus soil and waste material, including excess subsoil, unsuitable soil, trash, and debris, and legally dispose of them off Owner's property.

END OF SECTION 02930

# SECTION 033000 - CAST-IN-PLACE CONCRETE

## 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. Section includes cast-in-place concrete, including formwork, reinforcement, concrete materials, mixture design, placement procedures, and finishes.

B. Related Requirements:

1. Section 030513 "Concrete Water Vapor Reducing Admixture" for admixture to be used in concrete for interior slabs-on-grade.
2. Section 096519 Resilient Tile Flooring.

### 1.3 DEFINITIONS

A. Cementitious Materials: Portland cement alone or in combination with one or more of the following: blended hydraulic cement, fly ash, slag cement, other pozzolans, and silica fume; materials subject to compliance with requirements.

B. W/C Ratio: The ratio by weight of water to cementitious materials.

### 1.4 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site.

1. Before submitting design mixtures, review concrete design mixture and examine procedures for ensuring quality of concrete materials. Require representatives of each entity directly concerned with cast-in-place concrete to attend, including the following:

a. Contractor's superintendent.
b. Independent testing agency responsible for concrete design mixtures.
c. Ready-mix concrete manufacturer.
d. Concrete Subcontractor.
e. Special concrete finish Subcontractor.

2. Review the following:

a. Special inspection and testing and inspecting agency procedures for field quality control.
b. Construction joints, control joints, isolation joints, and joint-filler strips.
c. Semirigid joint fillers.
d. Vapor-retarder installation.
e. Anchor rod and anchorage device installation tolerances.
f. Cold and hot weather concreting procedures.
g. Concrete finishes and finishing.
h. Curing procedures.
i. Forms and form-removal limitations.
j. Shoring and reshoring procedures.
k. Methods for achieving specified floor and slab flatness and levelness.
l. Floor and slab flatness and levelness measurements.
m. Concrete repair procedures.
n. Concrete protection.

1.5 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Design Mixtures: For each concrete mixture in accordance with ACI 318 Chapter 5. 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. Construction Joint Layout: Indicate proposed construction joints required to construct the structure.

1. Location of construction joints is subject to approval of the Architect.

E. Samples: For vapor retarder.

1.6 INFORMATIONAL SUBMITTALS

A. Qualification Data: For Installer, manufacturer, testing agency.

B. 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. Curing compounds.

6. Floor and slab treatments.
7. Bonding agents.
8. Adhesives.
9. Vapor retarders.
10. Semirigid joint filler.
11. Joint-filler strips.
12. Repair materials.

C. Material Test Reports: For the following, from a qualified testing agency:

1. Aggregates: Include service record data indicating absence of deleterious expansion of concrete due to alkali aggregate reactivity.

D. Floor surface flatness and levelness measurements indicating compliance with specified tolerances.

E. Field quality-control reports.

F. Minutes of preinstallation conference.

## 1.7 QUALITY ASSURANCE

A. Installer Qualifications: A qualified installer who employs Project personnel qualified as a ACI-certified Flatwork Technician and Finisher and a supervisor who is a certified ACI Flatwork Concrete Finisher/Technician or an ACI Concrete Flatwork Technician.

B. Ready-Mixed Concrete Manufacturer Qualifications: A firm experienced in manufacturing ready-mixed concrete products and that complies with ASTM C94 requirements for production facilities and equipment.

1. Manufacturer certified according to NRMCA's "Certification of Ready Mixed Concrete Production Facilities."

C. Testing Agency Qualifications: An independent agency, acceptable to authorities having jurisdiction, qualified according to ASTM C 1077 and ASTM E 329 for testing indicated.

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.

## 1.8 PRECONSTRUCTION TESTING

A. Preconstruction Testing Service: Engage a qualified testing agency to perform preconstruction testing on concrete mixtures.

1. Include the following information in each test report:

    a. Admixture dosage rates.
    b. Slump.
    c. Air content.
    d. Seven-day compressive strength.
    e. 28-day compressive strength.

1.9 DELIVERY, STORAGE, AND HANDLING

A. Steel Reinforcement: Deliver, store, and handle steel reinforcement to prevent bending and damage.

B. Comply with ASTM C94 and ACI 301.

1.10 FIELD CONDITIONS

A. 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. Protect concrete work from physical damage or reduced strength that could be caused by frost, freezing actions, or low temperatures
2. When average high and low temperature is expected to fall below 40 deg F for three successive days, maintain delivered concrete mixture temperature within the temperature range required by ACI 301.
3. Do not use frozen materials or materials containing ice or snow.
4. Do not place concrete on frozen subgrade or on subgrade containing frozen materials.
5. Do not use calcium chloride, salt, or other materials containing antifreeze agents or chemical accelerators unless otherwise specified and approved in mixture designs.

B. Hot-Weather Placement: Comply with ACI 301 and as follows:

1. Maintain concrete temperature below 90 deg F 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.

PART 2 - PRODUCTS

2.1 CONCRETE, GENERAL

A. ACI Publications: Comply with the following unless modified by requirements in the Contract Documents:

1. ACI 301.
2. ACI 117.
3. ACI 318.

2.2 FORM-FACING MATERIALS

A. 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.

B. Chamfer Strips: Wood, metal, PVC, or rubber strips, 3/4 by 3/4 inch, minimum.

C. Rustication Strips: Wood, metal, PVC, or rubber strips, kerfed for ease of form removal.

D. Form-Release Agent: Commercially formulated form-release agent that does not bond with, stain, or adversely affect concrete surfaces and does not impair subsequent treatments of concrete surfaces.

1. Formulate form-release agent with rust inhibitor for steel form-facing materials.

E. Form Ties: Factory-fabricated, removable or snap-off glass-fiber-reinforced plastic or metal form ties designed to resist lateral pressure of fresh concrete on forms and to prevent spalling of concrete on removal.

1. Furnish units that leave no corrodible metal closer than 1 inch to the plane of exposed concrete surface.
2. Furnish ties that, when removed, leave holes no larger than 1 inch in diameter in concrete surface.

2.3 STEEL REINFORCEMENT

A. Reinforcing Bars: ASTM A 615, Grade 60, deformed.

B. Steel Bar Mats: ASTM A 184, fabricated from ASTM A 615, Grade 60, deformed bars, assembled with clips.

C. Plain-Steel Wire: ASTM A 1064, as drawn.

D. Deformed-Steel Wire: ASTM A 1064.

E. Plain-Steel Welded-Wire Reinforcement: ASTM A 1064, plain, fabricated from as-drawn steel wire into flat sheets.

F. Deformed-Steel Welded-Wire Reinforcement: ASTM A 1064, flat sheet.

2.4 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:

1. For concrete surfaces exposed to view, where legs of wire bar supports contact forms, use CRSI Class 1 plastic-protected steel wire or CRSI Class 2 stainless-steel bar supports.

2.5 CONCRETE MATERIALS

A. Cementitious Materials:

1. Portland Cement: ASTM C 150, Type I/II, gray.
2. Fly Ash: ASTM C 618, Class F or C.
3. Slag Cement: ASTM C 989, Grade 100 or 120.

B. Normal-Weight Aggregates: ASTM C 33, coarse aggregate or better, graded.

1. Maximum Coarse-Aggregate Size: 3/4 inch nominal.
2. Fine Aggregate: Free of materials with deleterious reactivity to alkali in cement.

C. Air-Entraining Admixture: ASTM C 260.

D. Chemical Admixtures: Certified by manufacturer to be compatible with other admixtures and that do 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, Type A.
2. Retarding Admixture: ASTM C 494, Type B.
3. Water-Reducing and Retarding Admixture: ASTM C 494, Type D.
4. High-Range, Water-Reducing Admixture: ASTM C 494, Type F.
5. High-Range, Water-Reducing and Retarding Admixture: ASTM C 494, Type G.
6. Plasticizing and Retarding Admixture: ASTM C 1017, Type II.

E. Moisture Mitigation / Concrete Waterproofing Admixture:

1. Refer to Section 030513 “Concrete Water Vapor Admixture”.

F. Water: ASTM C 94 and potable.

## 2.6 VAPOR RETARDERS

A. Sheet Vapor Retarder: ASTM E1745, Class A, except with a permeance of less than 0.01 perms. Minimum thickness of material equal to 15 mils. Include manufacturer's recommended adhesive or pressure-sensitive tape.

## 2.7 CURING MATERIALS

A. Evaporation Retarder: Waterborne, monomolecular film forming, manufactured for application to fresh concrete.

B. Absorptive Cover: AASHTO M 182, Class 2, burlap cloth made from jute or kenaf, weighing approximately 9 oz./sq. yd. 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.

## 2.8 RELATED MATERIALS

A. Expansion- and Isolation-Joint-Filler Strips: ASTM D 1751, asphalt-saturated cellulosic fiber or ASTM D 1752, cork or self-expanding cork.

B. Semirigid Joint Filler: Two-component, semirigid, 100 percent solids, epoxy resin with a Type A shore durometer hardness of 80, aromatic polyurea with a Type A shore durometer hardness range of 90 to 95 according to ASTM D 2240.

C. Epoxy Bonding Adhesive: ASTM C 881, two-component epoxy resin, capable of humid curing and bonding to damp surfaces, of class suitable for application temperature and of grade to suit requirements, and as follows:

1. Types IV and V, load bearing, for bonding hardened or freshly mixed concrete to hardened concrete.

## 2.9 REPAIR MATERIALS

A. Repair Underlayment: Cement-based, polymer-modified, self-leveling product that can be applied in thicknesses from 1/8 inch 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 or coarse sand as recommended by underlayment manufacturer.
4. Compressive Strength: Not less than 4000 psi at 28 days when tested according to ASTM C 109.

B. Repair Overlayment: Cement-based, polymer-modified, self-leveling product that can be applied in thicknesses from 1/4 inch 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.
2. Primer: Product of topping manufacturer recommended for substrate, conditions, and application.
3. Aggregate: Well-graded, washed gravel, 1/8 to 1/4 inch or coarse sand as recommended by topping manufacturer.
4. Compressive Strength: Not less than 5000 psi at 28 days when tested according to ASTM C 109.

## 2.10 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: 25 percent.
2. Slag Cement: 25 percent.
3. Combined Fly Ash or Pozzolan and Slag Cement: 50 percent portland cement minimum.

C. Limit water-soluble, chloride-ion content in hardened concrete to 0.30 percent by weight of cement.

D. Admixtures: Use admixtures according to manufacturer's written instructions.

1. Use water-reducing, high-range water-reducing, plasticizing 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 w/c ratio below 0.50.

2.11 CONCRETE MIXTURES FOR BUILDING ELEMENTS

A. Normal-weight concrete: Footings, foundation walls, slabs on grade, and suspended slabs.

1. Minimum Compressive Strength: As indicated on the structural drawings.
2. Maximum W/C Ratio: As indicated on the structural drawings.
3. Slump Limit: Unless otherwise specified or permitted, concrete shall have, at the point of delivery, a slump of 4 in. Determine the slump by ASTM C 143. Slump tolerances shall meet the requirements of ACI 117. When use of a Type I or II plasticizing admixture conforming to ASTM C 1017 or when a Type F or G high-range water-reducing admixture conforming to ASTM C 494 is permitted to increase the slump of concrete, concrete shall have a slump of 2 to 4 in. before the admixture is added and a maximum slump of 8 in. at the point of delivery after the admixture is added, unless otherwise specified.
4. Air Content: As indicated on the structural drawings. Do not allow air content of trowel-finished floors to exceed 3 percent.

2.12 FABRICATING REINFORCEMENT

A. Fabricate steel reinforcement according to CRSI's "Manual of Standard Practice."

2.13 CONCRETE MIXING

A. Ready-Mixed Concrete: Measure, batch, mix, and deliver concrete according to ASTM C 94 and ASTM C 1116 and furnish batch ticket information.

1. When air temperature is between 85 and 90 deg F, reduce mixing and delivery time from 1-1/2 hours to 75 minutes; when air temperature is above 90 deg F, reduce mixing and delivery time to 60 minutes.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verification of Conditions:

1. Before placing concrete, verify that installation of concrete forms, accessories, and reinforcement, and embedded items is complete and that required inspections have been performed.
2. Do not proceed until unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Provide reasonable auxiliary services to accommodate field testing and inspections, acceptable to testing agency, including the following:

1. Daily access to the Work.
2. Incidental labor and facilities necessary to facilitate tests and inspections.
3. Secure space for storage, initial curing, and field curing of test samples, including source of water and continuous electrical power at Project site during site curing period for test samples.
4. Security and protection for test samples and for testing and inspection equipment at Project site.

3.3 FORMWORK INSTALLATION

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.

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 for smooth-formed finished surfaces.
2. Class B, 1/4 inch for rough-formed finished surfaces.

D. Construct forms tight enough to prevent loss of concrete mortar.

E. Construct 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. 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.

## 3.4 EMBEDDED ITEM INSTALLATION

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.

1. Use setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.
2. Install anchor rods, accurately located, to elevations required and complying with tolerances in Section 7.5 of AISC 303.

## 3.5 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 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.

1. Leave formwork for beam soffits, joists, slabs, and other structural elements that support weight of concrete in place until concrete has achieved at least 70 percent of its 28-day design compressive strength.

B. Clean and repair surfaces of forms to be reused in the Work. Split, frayed, delaminated, or otherwise damaged form-facing material are not 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.

## 3.6 VAPOR-RETARDER INSTALLATION

A. Sheet Vapor Retarders: Place, protect, and repair sheet vapor retarder in accordance with ASTM E1643 and manufacturer's written instructions.

1. Install vapor retarder with longest dimension parallel with direction of concrete pour.
2. Face laps away from exposed direction of concrete pour.
3. Lap vapor retarder over footings and grade beams not less than 6 inches, sealing vapor retarder to concrete.
4. Lap joints 6 inches and seal with manufacturer's recommended tape.

5. Turn up and terminate vapor retarder against side of foundation walls such that vapor retarder ends at top of floor slab and provides a bond break between the concrete slab and wall.
6. Seal penetrations in accordance with vapor retarder manufacturer's instructions.
7. Protect vapor retarder during placement of reinforcement and concrete.

    a. Repair damaged areas by patching with vapor retarder material, overlapping damages area by 6 inches on all sides, and sealing to vapor retarder.

## 3.7 STEEL REINFORCEMENT INSTALLATION

A. General: Comply with CRSI's "Manual of Standard Practice" for fabricating, placing, and supporting 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 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.

    1. Weld reinforcing bars according to AWS D1.4, where indicated.

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.

## 3.8 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.

C. Contraction Joints in Slabs-on-Grade: Form weakened-plane contraction joints, sectioning concrete into areas. Space joints at approximately 30 times the slab thickness, in inches, maintain an aspect ratio no greater than 2:1. Construct contraction joints for a depth equal to at least one-fourth of concrete thickness as follows:

    1. Sawed Joints: Form contraction joints with power saws equipped with shatterproof abrasive or diamond-rimmed blades. Cut 1/8-inch wide joints into

concrete when cutting action does 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 or more than 1 inch below finished concrete surface where joint sealants, specified in Section 079200 "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.

## 3.9 CONCRETE PLACEMENT

A. Before placing concrete, verify that installation of formwork, reinforcement, embedded items, and vapor retarder is complete and that required inspections are completed.

1. Immediately prior to concrete placement, inspect vapor retarder for damage and deficient installation, and repair defective areas.

B. Provide continuous inspection of vapor retarder during concrete placement and make necessary repairs to damaged areas as Work progresses.

C. Do not add water to concrete during delivery, at Project site, or during placement unless approved by Architect.

D. Deposit concrete continuously in one layer or in horizontal layers of such thickness that no new concrete is placed on concrete that has hardened enough to cause seams or planes of weakness.

1. If a section cannot be placed continuously, provide construction joints as indicated.
2. Deposit concrete to avoid segregation.
3. Deposit concrete in horizontal layers of depth not to exceed formwork design pressures and in a manner to avoid inclined construction joints.
4. Consolidate placed concrete with mechanical vibrating equipment according to ACI 301.

    a. Do not use vibrators to transport concrete inside forms.
    b. Insert and withdraw vibrators vertically at uniformly spaced locations to rapidly penetrate placed layer and at least 6 inches into preceding layer.
    c. Do not insert vibrators into lower layers of concrete that have begun to lose plasticity.
    d. 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. Level concrete, cut high areas, and fill low areas.
5. Slope surfaces uniformly to drains where required.
6. Begin initial floating using bull floats or darbies to form a uniform and open-textured surface plane, before excess bleedwater appears on the surface.
7. Do not further disturb slab surfaces before starting finishing operations.

## 3.10 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.

## 3.11 FINISHING FLOORS AND SLABS

A. General: Comply with ACI 302.1R recommendations for screeding, restraightening, 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 restraightening until surface is left with a uniform, smooth, granular texture.

1. Apply float finish to surfaces indicated and to surfaces to receive trowel finish and to be covered with fluid-applied or sheet waterproofing, built-up or membrane roofing, or sand-bed terrazzo.

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 indicated and 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, for a randomly trafficked floor surface:

    a. Classrooms and general areas: 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.
    b. Gymnasiums: Specified overall values of flatness, F(F) 30; and of levelness, F(L) 25; with minimum local values of flatness, F(F) 24; and of levelness, F(L) 17; for slabs-on-grade.

D. Trowel and Fine-Broom Finish: Apply a first trowel finish to surfaces indicated and where ceramic or quarry tile is to be installed by either thickset or thinset 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.

## 3.12 MISCELLANEOUS CONCRETE ITEM INSTALLATION

A. Filling In: Fill in holes and openings left in concrete structures after work of other trades is in place unless otherwise indicated.

1. Mix, place, and cure concrete, as specified, to blend with in-place construction.
2. Provide other miscellaneous concrete filling indicated or required to complete the Work.

B. Curbs: Provide monolithic finish to interior curbs by stripping forms while concrete is still green and by steel-troweling surfaces to a hard, dense finish with corners, intersections, and terminations slightly rounded.

C. Equipment Bases and Foundations:

1. Coordinate sizes and locations of concrete bases with actual equipment provided.
2. Construct concrete bases 6 inches high unless otherwise indicated, and extend base not less than 6 inches in each direction beyond the maximum dimensions of supported equipment unless otherwise indicated or unless required for seismic anchor support.
3. Minimum Compressive Strength: 4000 psi at twenty-eight (28) days.

4. Install #3 dowel bars with 90 degree standard hooks to connect concrete base to concrete floor. Unless otherwise indicated, install dowel rods on 18-inchcenters around the full perimeter of concrete base.

## 3.13 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 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 remainder of curing period.

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 Curing: Keep surfaces continuously moist for not less than seven days with the following materials:

    a. Water.
    b. Continuous water-fog spray.
    c. Absorptive cover, water saturated, and kept continuously wet. Cover concrete surfaces and edges with 12-inch lap over adjacent absorptive covers.

2. 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, 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. Moisture cure or use moisture-retaining covers to cure concrete surfaces to receive floor coverings.
    b. Moisture cure or use moisture-retaining covers to cure concrete surfaces to receive penetrating liquid floor treatments.
    c. Cure concrete surfaces to receive floor coverings with either a moisture-retaining cover or a curing compound that the manufacturer certifies does not interfere with bonding of floor covering used on Project.

3. 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 does not interfere with bonding of floor covering used on Project.

## 3.14 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.

## 3.15 FIELD QUALITY CONTROL

A. Special Inspections: Owner will engage a special inspector and qualified testing and inspecting agency to perform field tests and inspections and prepare test reports.

B. Testing Agency: Engage a qualified testing and inspecting agency to perform tests and inspections and to submit reports.

C. Inspections:

1. Steel reinforcement placement.
2. Headed bolts and studs.
3. Verification of use of required design mixture.
4. Concrete placement, including conveying and depositing.
5. Curing procedures and maintenance of curing temperature.
6. Verification of concrete strength before removal of shores and forms from beams and slabs.

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., but less than 25 cu. yd., plus one set for each additional 50 cu. yd. or fraction thereof.

2. Slump: ASTM C 143; 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.
3. Air Content: ASTM C 231, pressure method, for normal-weight concrete; one test for each composite sample, but not less than one test for each day's pour of each concrete mixture.

4. Concrete Temperature: ASTM C 1064; one test hourly when air temperature is 40 deg F and below or 80 deg F and above, and one test for each composite sample.
5. Unit Weight: ASTM C 567, fresh unit weight of structural lightweight concrete; one test for each composite sample, but not less than one test for each day's pour of each concrete mixture.
6. Compression Test Specimens: ASTM C 31.

    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.

7. Compressive-Strength Tests: ASTM C 39; 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.

8. 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.
9. Strength of each concrete mixture will be satisfactory if every average of any three (3) 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.
10. Test results shall be reported in writing to Architect, 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.
11. 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.
12. 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 or by other methods as directed by Architect.
13. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.
14. 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 within 24 hours of finishing.

END OF SECTION 033000

SECTION 042000 - UNIT MASONRY

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Concrete masonry units.
2. Lintels.
3. Brick.
4. Mortar and grout materials.
5. Reinforcement.
6. Ties and anchors.
7. Embedded flashing.
8. Accessories.
9. Mortar and grout mixes.

B. Related Requirements:

1. Section 072100 "Thermal Insulation" for cavity wall insulation.
2. Section 076200 "Sheet Metal Flashing and Trim" for exposed sheet metal flashing and for furnishing manufactured reglets installed in masonry joints.

1.2 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Shop Drawings: For the following:

1. Masonry Units: Indicate sizes, profiles, coursing, and locations of special shapes.
2. Reinforcing Steel: Indicate bending, lap lengths, and placement of unit masonry reinforcing bars. Comply with ACI 315R.
3. Fabricated Flashing: Detail corner units, end-dam units, and other special applications.

C. Samples for Verification: For each type and color of the following:

1. Face brick, in the form of straps of five or more bricks.
2. Pigmented mortar. Make Samples using same sand and mortar ingredients to be used on Project.

1.4 INFORMATIONAL SUBMITTALS

A. Material Certificates: For each type of the following:

1. Masonry units.

a. Include material test reports substantiating compliance with requirements.
b. For brick, include size-variation data verifying that actual range of sizes falls within specified tolerances.
c. For exposed brick, include test report for efflorescence in accordance with ASTM C67/C67M.
d. For masonry units used in structural masonry, include data and calculations establishing average net-area compressive strength of units.

2. Cementitious materials. Include name of manufacturer, brand name, and type.
3. Mortar admixtures.
4. Preblended, dry mortar mixes. Include description of type and proportions of ingredients.
5. Grout mixes. Include description of type and proportions of ingredients.
6. Reinforcing bars.
7. Joint reinforcement.
8. Anchors, ties, and metal accessories.

B. Mix Designs: For each type of mortar and grout. Include description of type and proportions of ingredients.

1. Include test reports for mortar mixes required to comply with property specification. Test in accordance with ASTM C109/C109M for compressive strength, ASTM C1506 for water retention, and ASTM C91/C91M for air content.
2. Include test reports, in accordance with ASTM C1019, for grout mixes required to comply with compressive strength requirement.

C. Cold-Weather and Hot-Weather Procedures: Detailed description of methods, materials, and equipment to be used to comply with requirements.

1.5 QUALITY ASSURANCE

A. Qualifications:

1. Installers: All masonry flashing installers must complete the International Masonry Institute Flashing Upgrade training course.
2. Testing Agency Qualifications: Qualified in accordance with ASTM C1093 for testing indicated.

1.6 MOCKUPS

A. Wall Mockups: Build in-place mockup to verify selections made under Sample submittals to match existing, to demonstrate aesthetic effects to set quality standards for materials and execution.

1. Build mockups for typical exterior wall 48 inches (1219 mm) long by 48 inches (1219 mm) high by full thickness, including face and backup wythes and accessories.

    a. Include a sealant-filled joint at least 16 inches (406 mm) long in mockup.
    b. Include through-wall flashing installed for a 24-inch (610-mm) length in corner of exterior wall mockup approximately 16 inches (406 mm) down from top of mockup, with a 12-inch (305-mm) length of flashing left exposed to view (omit masonry above half of flashing).

2. Where masonry is to match existing, erect mockups adjacent and parallel to existing surface.
3. Clean one-half of exposed faces of mockups with masonry cleaner as indicated.
4. Protect accepted mockups from the elements with weather-resistant membrane.
5. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations by Change Order.
6. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Store masonry units on elevated platforms in a dry location. If units are not stored in an enclosed location, cover tops and sides of stacks with waterproof sheeting, securely tied. If units become wet, do not install until they are dry.

B. Store cementitious materials on elevated platforms, under cover, and in a dry location. Do not use cementitious materials that have become damp.

C. Store aggregates where grading and other required characteristics can be maintained and contamination avoided.

D. Deliver preblended, dry mortar mix in moisture-resistant containers. Store preblended, dry mortar mix in delivery containers on elevated platforms in a dry location or in covered weatherproof dispensing silos.

E. Store masonry accessories, including metal items, to prevent corrosion and accumulation of dirt and oil.

1.8 FIELD CONDITIONS

A. Protection of Masonry: During construction, cover tops of walls, projections, and sills with waterproof sheeting at end of each day's work. Cover partially completed masonry when construction is not in progress.

1. Extend cover a minimum of 24 inches (610 mm) down both sides of walls, and hold cover securely in place.

B. Stain Prevention: Prevent grout, mortar, and soil from staining the face of masonry to be left exposed or painted. Immediately remove grout, mortar, and soil that come in contact with such masonry.

1. Protect base of walls from rain-splashed mud and from mortar splatter by spreading coverings on ground and over wall surface.
2. Protect sills, ledges, and projections from mortar droppings.
3. Protect surfaces of window and door frames, as well as similar products with painted and integral finishes, from mortar droppings.
4. Turn scaffold boards near the wall on edge at the end of each day to prevent rain from splashing mortar and dirt onto completed masonry.

C. Cold-Weather Requirements: Do not use frozen materials or materials mixed or coated with ice or frost. Do not build on frozen substrates. Remove and replace unit masonry damaged by frost or by freezing conditions. Comply with cold-weather construction requirements contained in TMS 602.

1. Cold-Weather Cleaning: Use liquid cleaning methods only when air temperature is 40 deg F (4 deg C) and higher and will remain so until masonry has dried, but not less than seven days after completing cleaning.

D. Hot-Weather Requirements: Comply with hot-weather construction requirements contained in TMS 602.

## PART 2 - PRODUCTS

### 2.1 UNIT MASONRY, GENERAL

A. Masonry Standard: Comply with TMS 602, except as modified by requirements in the Contract Documents.

B. Defective Units: Referenced masonry unit standards may allow a certain percentage of units to contain chips, cracks, or other defects exceeding limits stated. Do not use units where such defects are exposed in the completed Work.

C. Fire-Resistance Ratings: Comply with requirements for fire-resistance-rated assembly designs indicated.

1. Where fire-resistance-rated construction is indicated, use the equivalent thickness method for masonry units in accordance with ACI 216.1.

### 2.2 CONCRETE MASONRY UNITS

A. 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 square-edged units for outside corners unless otherwise indicated.

B. CMUs: ASTM C90, As indicated on structural drawings.

1. Size (Width): Manufactured to dimensions 3/8 inch (10 mm) less than nominal dimensions.

C. Decorative CMUs: ASTM C90, normal weight.

1. Manufacturer: Basis of Design, Westbrook Concrete Block; Polished Face.
2. Unit Compressive Strength: As indicated on Structural Drawings.
3. Size (Width): Match existing.
4. Pattern and Texture: Match existing.
5. Colors: GFP-302.
6. Special Aggregate: Provide units made with aggregate matching aggregate in Architect's sample.

## 2.3 LINTELS

A. Masonry Lintels: Prefabricated or built-in-place masonry lintels made from bond beam CMUs matching adjacent CMUs in color, texture, and density classification, with reinforcing bars placed as indicated and filled with coarse grout. Cure precast lintels before handling and installing. Temporarily support built-in-place lintels until cured.

## 2.4 BRICK

A. Manufacturer: Summit Brick, Lakewood Plant.

B. 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 requiring brick of size, form, color, and texture on exposed surfaces that cannot be produced by sawing or where shapes produced by sawing would result in sawed surfaces being exposed to view.

C. Clay Face Brick: Facing brick complying with ASTM C216, Grade SW, Type FBX.

1. Initial Rate of Absorption: Less than 30 g/30 sq. in. (30 g/194 sq. cm) per minute when tested in accordance with ASTM C67/C67M.
2. Efflorescence: Provide brick that has been tested in accordance with ASTM C67/C67M and is rated "not effloresced."
3. Color and Texture: LB611 Light Gray, smooth.

## 2.5 MORTAR AND GROUT MATERIALS

A. Portland Cement: ASTM C150/C150M, Type I or II, except Type III may be used for cold-weather construction. Provide natural color or white cement as required to produce mortar color indicated.

B. Hydrated Lime: ASTM C207, Type S.

C. Mortar Color: Match existing.

D. Aggregate for Mortar: ASTM C144.

1. For mortar that is exposed to view, use washed aggregate consisting of natural sand or crushed stone.
2. For joints less than 1/4-inch (6.4 mm) thick, use aggregate graded with 100 percent passing the No. 16 (1.18-mm) sieve.
3. Colored-Mortar Aggregates: Natural sand or crushed stone of color necessary to produce required mortar color.

E. Aggregate for Grout: ASTM C404.

F. Water: Potable.

## 2.6 REINFORCEMENT

A. Uncoated-Steel Reinforcing Bars: ASTM A615/A615M or ASTM A996/A996M, Grade 60 (Grade 420).

B. Masonry-Joint Reinforcement, General: ASTM A951/A951M.

1. Interior Walls: Hot-dip galvanized carbon steel.
2. Exterior Walls: Hot-dip galvanized carbon steel.
3. Wire Size for Side Rods: 0.148-inch (3.77-mm) diameter.
4. Wire Size for Cross Rods: 0.148-inch (3.77-mm) diameter.
5. Wire Size for Veneer Ties: 0.148-inch (3.77-mm) diameter.
6. Spacing of Cross Rods, Tabs, and Cross Ties: Not more than 16 inches (406 mm) o.c.
7. Provide in lengths of not less than 10 ft. (3 m), with prefabricated corner and tee units.

C. Masonry-Joint Reinforcement for Single-Wythe Masonry: Ladder or truss type with single pair of side rods.

D. Masonry-Joint Reinforcement for Veneers Anchored with Seismic Masonry-Veneer Anchors: Single 0.187-inch- (4.76-mm-) diameter, hot-dip galvanized carbon steel continuous wire.

## 2.7 TIES AND ANCHORS

A. Materials: Provide ties and anchors specified in this article that are made from materials that comply with the following unless otherwise indicated:

1. Hot-Dip Galvanized, Carbon-Steel Wire: ASTM A1064/A1064M, with ASTM A153/A153M, Class B-2 coating.
2. Steel Plates, Shapes, and Bars: ASTM A36/A36M.

B. Partition Top Anchors: 0.105-inch- (2.66-mm-) thick metal plate with a 3/8-inch- (10-mm-) diameter metal rod 6 inches (152 mm) long welded to plate and with closed-end plastic tube fitted over rod that allows rod to move in and out of tube. Fabricate from steel, hot-dip galvanized after fabrication.

C. Adjustable Masonry-Veneer Anchors:

1. General: Provide anchors that allow vertical adjustment but resist tension and compression forces perpendicular to plane of wall, for attachment over sheathing to metal studs, and as follows:

a. Structural Performance Characteristics: Capable of withstanding a 100-lbf load in both tension and compression without deforming or developing play in excess of 0.05 inch.

2. Wire Ties: Rectangular-shaped wire ties fabricated from 0.187-inch- diameter, hot-dip galvanized-steel wire.
3. Masonry-Veneer Anchors:

a. Products: Subject to compliance with requirements, provide the following:

1) Hohmann & Barnard; HB-5213 Adjustable Veneer Anchor or Architect approved equal.

## 2.8 EMBEDDED FLASHING

A. Metal Flashing: Provide metal flashing complying with Section 076200 "Sheet Metal Flashing and Trim" and as follows:

1. Fabricate through-wall metal flashing embedded in masonry from stainless steel, with ribs at 3-inch intervals along length of flashing to provide an integral mortar bond.

a. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:

1) Cheney Flashing Company; Cheney 3-Way Flashing (Sawtooth).
2) Keystone Flashing Company, Inc; Keystone 3-Way Interlocking Thruwall Flashing.
3) Sandell Manufacturing Co., Inc; Mechanically Keyed Flashing.

2. Fabricate through-wall flashing with drip edge unless otherwise indicated. Fabricate by extending flashing 1/2 inch out from wall, with outer edge bent down 30 degrees and hemmed.
3. Fabricate metal drip edges for ribbed metal flashing from plain metal flashing of same metal as ribbed flashing and extending at least 3 inches into wall with hemmed inner edge to receive ribbed flashing and form a hooked seam. Form hem on upper surface of metal so that completed seam will shed water.
4. Metal Expansion-Joint Strips: Fabricate from stainless steel to shapes indicated.
5. Metal Drip Edge: Fabricate from stainless steel. Extend minimum 3 inches into wall and 1/2 inch out from face of wall, with outer edge bent down 30 degrees and hemmed.

B. Flexible Flashing: Use the following unless otherwise indicated:

1. Stainless Steel Flashing: Composite, flashing product flexible 2 mil sheet of type 304, ASTM A240 stainless steel, 8 mils of butyl adhesive and a siliconized release liner.

    a. Products: Subject to compliance with requirements, provide one of the following:

        1) York Manufacturing, Inc.: York 304 SS.
        2) Illinois Products, Inc.; IPCO Self-Adhesive Stainless Steel.
        3) STS Coating, Inc.; Wall Guardian Self Adhering Stainless Steel Flashing.

2. Adhesive: Block co-polymer.
3. Polyether Sealant:

    a. York Manufacturing, Inc.: UniverSeal US-100.
    b. STS Coatings: GreatSeal LT-100.
    c. Prosoco, Inc.; R-Guard Joint Seam Sealer.
    d. Splice Tape:
        1) York Manufacturing, Inc.; York 304 SS.
        2) Illinois Products, Inc.; IPCO Self-Adhering Stainless Steel Flashing.

4. Corner and End Dams: 26-gauge stainless steel pre-manufactured corners.

C. Termination Bar: Rigid PVC or stainless steel termination bar with sealant catch lip.

D. Solder and Sealants for Sheet Metal Flashings: As specified in Section 076200 "Sheet Metal Flashing and Trim."

E. Adhesives, Primers, and Seam Tapes for Flashings: Flashing manufacturer's standard products or products recommended by flashing manufacturer for bonding flashing sheets to each other and to substrates.

F. Application: Unless otherwise indicated, use the following:

1. Wall base flashing: Use metal flashing.
2. Wall openings: Use flexible flashing.

2.9 ACCESSORIES

A. Compressible Filler: Premolded filler strips complying with ASTM D1056, Grade 2A1; compressible up to 35 percent; of width and thickness indicated; formulated from neoprene, urethane or PVC.

B. Preformed Control-Joint Gaskets: Made from styrene-butadiene-rubber compound, complying with ASTM D2000, Designation M2AA-805 or PVC, complying with ASTM D2287, Type PVC-65406 and designed to fit standard sash block and to maintain lateral stability in masonry wall; size and configuration as indicated.

C. Bond-Breaker Strips: Asphalt-saturated felt complying with ASTM D226/D226M, Type I (No. 15 asphalt felt).

1. Rainscreen Drainage Mat: Sheets full depth of cavity, minimum 3/8 inch (9.52 mm) thick and installed to full height of cavity, with additional strips 4 inches (102 mm) high at weep holes and thick enough to fill entire depth of cavity to prevent weep holes from clogging with mortar.

D. Cavity Drainage Material: Free-draining mesh, made from polymer strands that will not degrade within the wall cavity.

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. Advanced Building Products Inc.
b. Heckmann Building Products, Inc.; #84 Wall Defender.
c. Mortar Net USA, Ltd.: Mortar Net.
d. York Flashing; Weep Armor.

2. Provide one of the following configurations:

a. Strips, full-depth of cavity and 10 inches high, with keystone shaped notches designed to catch mortar droppings and prevent that prevent weep holes from clogging.
b. Strips, not less than 1-1/2 inches thick and 10 inches high, with dimpled surface designed to catch mortar droppings and prevent weep holes from clogging with mortar.

E. Detergent Cleaner: Manufacturer's standard-strength, cleaner designed for removing surface dust and dirt, mortar stains, grout stains, efflorescence, and other new construction stains from new masonry without discoloring or damaging masonry surfaces. Use product expressly approved for intended use by cleaner manufacturer and manufacturer of masonry units being cleaned.

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
a. Diedrich Technologies, Inc.; Eco-Scrub Acid Free Masonry Cleaner.
b. ProSoCo, Inc.; Enviro Klean Safety Klean.

2.10 MORTAR AND GROUT MIXES

A. General: Do not use admixtures, including pigments, air-entraining agents, accelerators, retarders, water-repellent agents, antifreeze compounds, or other admixtures unless otherwise indicated.

1. Do not use calcium chloride in mortar or grout.
2. Use portland cement-lime mortar unless otherwise indicated.

B. Mortar for Unit Masonry: Comply with ASTM C270, Property Specification. Provide the following types of mortar for applications stated unless another type is indicated or needed to provide required compressive strength of masonry.

1. For masonry below grade or in contact with earth, use Type M.
2. For reinforced masonry, use Type S.
3. For exterior, above-grade, load-bearing, nonload-bearing walls, and parapet walls; for interior load-bearing walls; for interior nonload-bearing partitions; and for other applications where another type is not indicated, use Type N.
4. For interior nonload-bearing partitions, Type O may be used instead of Type N.

C. Grout for Unit Masonry: Comply with ASTM C476.

1. Use grout of type indicated or, if not otherwise indicated, of type (fine or coarse) that will comply with TMS 602 for dimensions of grout spaces and pour height.
2. Proportion grout in accordance with ASTM C476, Table 1 or paragraph 4.2.1.2 for specified 28-day compressive strength indicated, but not less than 2000 psi (14 MPa).
3. Provide grout with a slump of 8 to 11 inches (203 to 279 mm) as measured in accordance with ASTM C143/C143M.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.

1. For the record, prepare written report, endorsed by Installer, listing conditions detrimental to performance of the Work.
2. Verify that foundations are within tolerances specified.
3. Verify that reinforcing dowels are properly placed.
4. Verify that substrates are free of substances that impair mortar bond.

B. Before installation, examine rough-in and built-in construction for piping systems to verify actual locations of piping connections.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION, GENERAL

A. Thickness: Build cavity and composite walls and other masonry construction to full thickness shown. Build single-wythe walls to actual widths of masonry units, using units of widths indicated.

B. Build chases and recesses to accommodate items specified in this and other Sections.

C. Leave openings for equipment to be installed before completing masonry. After installing equipment, complete masonry to match construction immediately adjacent to opening.

D. Use full-size units without cutting if possible. If cutting is required to provide a continuous pattern or to fit adjoining construction, cut units with motor-driven saws; provide clean, sharp, unchipped edges. Allow units to dry before laying unless wetting of units is specified. Install cut units with cut surfaces and, where possible, cut edges concealed.

E. Select and arrange units for exposed unit masonry to produce a uniform blend of colors and textures. Mix units from several pallets or cubes as they are placed.

F. Matching Existing Masonry: Match coursing, bonding, color, and texture of existing masonry.

G. Wetting of Brick: Wet brick before laying if initial rate of absorption exceeds 30 g/30 sq. in. (30 g/194 sq. cm) per minute when tested in accordance with ASTM C67/C67M. Allow units to absorb water so they are damp but not wet at time of laying.

3.3 TOLERANCES

A. Dimensions and Locations of Elements:

1. For dimensions in cross section or elevation, do not vary by more than plus 1/2 inch (13 mm) or minus 1/4 inch (6.4 mm).
2. For location of elements in plan, do not vary from that indicated by more than plus or minus 1/2 inch (13 mm).
3. For location of elements in elevation, do not vary from that indicated by more than plus or minus 1/4 inch (6.4 mm) in a story height or 1/2 inch (13 mm) total.

B. Lines and Levels:

1. For bed joints and top surfaces of bearing walls, do not vary from level by more than 1/4 inch in 10 ft. (6.4 mm in 3 m), or 1/2-inch (13-mm) maximum.
2. For conspicuous horizontal lines, such as lintels, sills, parapets, and reveals, do not vary from level by more than 1/8 inch in 10 ft. (3.2 mm in 3 m), 1/4 inch in 20 ft. (6.4 mm in 6 m), or 1/2-inch (13-mm) maximum.
3. For vertical lines and surfaces, do not vary from plumb by more than 1/4 inch in 10 ft. (6.4 mm in 3 m), 3/8 inch in 20 ft. (10 mm in 6 m), or 1/2-inch (13-mm) maximum.
4. For conspicuous vertical lines, such as external corners, door jambs, reveals, and expansion and control joints, do not vary from plumb by more than 1/8 inch in 10

ft. (3.2 mm in 3 m), 1/4 inch in 20 ft. (6.4 mm in 6 m), or 1/2-inch (13-mm) maximum.

5. For lines and surfaces, do not vary from straight by more than 1/4 inch in 10 ft. (6.4 mm in 3 m), 3/8 inch in 20 ft. (10 mm in 6 m), or 1/2-inch (13-mm) maximum.
6. For vertical alignment of exposed head joints, do not vary from plumb by more than 1/4 inch in 10 ft. (6.4 mm in 3 m), or 1/2-inch (13-mm) maximum.
7. For faces of adjacent exposed masonry units, do not vary from flush alignment by more than 1/16 inch (1.6 mm) except due to warpage of masonry units within tolerances specified for warpage of units.

C. Joints:

1. For bed joints, do not vary from thickness indicated by more than plus or minus 1/8 inch (3.2 mm), with a maximum thickness limited to 1/2 inch (13 mm).
2. For exposed bed joints, do not vary from bed-joint thickness of adjacent courses by more than 1/8 inch (3.2 mm).
3. For head and collar joints, do not vary from thickness indicated by more than plus 3/8 inch (10 mm) or minus 1/4 inch (6.4 mm).
4. For exposed head joints, do not vary from thickness indicated by more than plus or minus 1/8 inch (3.2 mm). Do not vary from adjacent bed-joint and head-joint thicknesses by more than 1/8 inch (3.2 mm).
5. For exposed bed joints and head joints of stacked bond, do not vary from a straight line by more than 1/16 inch (1.6 mm) from one masonry unit to the next.

## 3.4 LAYING MASONRY WALLS

A. Lay out walls in advance for accurate spacing of surface bond patterns with uniform joint thicknesses and for accurate location of openings, movement-type joints, returns, and offsets. Avoid using less-than-half-size units, particularly at corners, jambs, and, where possible, at other locations.

B. Bond Pattern for Exposed Masonry: Unless otherwise indicated, lay exposed masonry to match existing, do not use units with less-than-nominal 4-inch (102-mm) horizontal face dimensions at corners or jambs.

C. Stopping and Resuming Work: Stop work by stepping back units in each course from those in course below; do not tooth. When resuming work, clean masonry surfaces that are to receive mortar, remove loose masonry units and mortar, and wet brick if required before laying fresh masonry.

D. Built-in Work: As construction progresses, build in items specified in this and other Sections. Fill in solidly with masonry around built-in items.

E. Fill space between steel frames and masonry solidly with mortar unless otherwise indicated.

F. Where built-in items are to be embedded in cores of hollow masonry units, place a layer of metal lath, wire mesh, or plastic mesh in the joint below, and rod mortar or grout into core.

G. Fill cores in hollow CMUs with grout 24 inches (610 mm) under bearing plates, beams, lintels, posts, and similar items unless otherwise indicated.

H. Build nonload-bearing interior partitions full height of story to underside of solid floor or roof structure above unless otherwise indicated.

1. Install compressible filler in joint between top of partition and underside of structure above.
2. Fasten partition top anchors to structure above and build into top of partition. Grout cells of CMUs solidly around plastic tubes of anchors, and push tubes down into grout to provide 1/2-inch (13-mm) clearance between end of anchor rod and end of tube. Space anchors 48 inches (1219 mm) o.c. unless otherwise indicated.
3. At fire-rated partitions, treat joint between top of partition and underside of structure above to comply with Section 078443 "Joint Firestopping."

## 3.5 MORTAR BEDDING AND JOINTING

A. Lay CMUs as follows:

1. Bed face shells in mortar and make head joints of depth equal to bed joints.
2. Bed webs in mortar in all courses of piers, columns, and pilasters.
3. Bed webs in mortar in grouted masonry, including starting course on footings.
4. Fully bed entire units, including areas under cells, at starting course on footings where cells are not grouted.
5. Fully bed units and fill cells with mortar at anchors and ties as needed to fully embed anchors and ties in mortar.

B. Lay solid masonry units with completely filled bed and head joints; butter ends with sufficient mortar to fill head joints and shove into place. Do not deeply furrow bed joints or slush head joints.

C. Tool exposed joints slightly concave when thumbprint hard, using a jointer larger than joint thickness unless otherwise indicated.

D. Cut joints flush where indicated to receive cavity wall insulation unless otherwise indicated.

## 3.6 CAVITY WALLS

A. Individual Metal Ties: Provide ties as shown installed in horizontal joints, but not less than one metal tie for 4.5 sq. ft. of wall area spaced not to exceed 36 inches o.c. horizontally and 16 inches o.c. vertically. Stagger ties in alternate courses. Provide additional ties within 12 inches of openings and space not more than 36 inches apart around perimeter of openings. At intersecting and abutting walls, provide ties at no more than 24 inches o.c. vertically.

1. Where bed joints of wythes do not align, use adjustable (two-piece) type ties.

2. Where one wythe is of clay masonry and the other of concrete masonry, use adjustable (two-piece) type ties to allow for differential movement regardless of whether bed joints align.
    a. Header Bonding: Provide masonry unit headers extending not less than 3 inches into each wythe. Space headers not over 12 inches clear horizontally and 16 inches clear vertically.
    b. Masonry Veneer Anchors: Comply with requirements for anchoring masonry veneers.

B. Keep cavities clean of mortar droppings and other materials during construction. Bevel beds away from cavity, to minimize mortar protrusions into cavity. Do not attempt to trowel or remove mortar fins protruding into cavity.

C. Apply air barrier to face of backup wall to comply with Section 072726 "Fluid-Applied Membrane Air Barriers."

D. Installing Cavity-Wall Insulation: As specified in Section 072100 "Thermal Insulation."

## 3.7 MASONRY JOINT REINFORCEMENT

A. General: Install entire length of longitudinal side rods in mortar with a minimum cover of 5/8 inch on exterior side of walls, 1/2 inch elsewhere. Lap reinforcement a minimum of 6 inches.

1. Space reinforcement not more than 16 inches o.c.
2. Space reinforcement not more than 8 inches o.c. in foundation walls and parapet walls.
3. Provide reinforcement not more than 8 inches above and below wall openings and extending 12 inches beyond openings in addition to continuous reinforcement.

B. Interrupt joint reinforcement at control and expansion joints unless otherwise indicated.

C. Provide continuity at corners by using prefabricated L-shaped units.

D. Cut and bend reinforcing units as directed by manufacturer for continuity at corners, returns, offsets, column fireproofing, pipe enclosures, and other special conditions.

## 3.8 ANCHORING MASONRY VENEERS

A. Anchor masonry veneers to concrete and masonry backup with masonry-veneer anchors to comply with the following requirements:

1. Fasten anchors to concrete and masonry backup with metal fasteners of type indicated. Use two fasteners unless anchor design only uses one fastener.
2. Embed tie sections in masonry joints.
3. Locate anchor sections to allow maximum vertical differential movement of ties up and down.
4. Space anchors as indicated, but not more than 16 inches o.c. vertically and 25 inches o.c. horizontally, with not less than one anchor for each 2.67 sq. ft. of wall

area. Install additional anchors within 12 inches of openings and at intervals, not exceeding 36 inches, around perimeter.

B. Provide not less than 2 inches of airspace between back of masonry veneer and face of insulation.

1. Keep airspace clean of mortar droppings and other materials during construction. Bevel beds away from airspace, to minimize mortar protrusions into airspace. Do not attempt to trowel or remove mortar fins protruding into airspace.

## 3.9 CONTROL AND EXPANSION JOINTS

A. General: Install control and expansion joint materials in unit masonry as masonry progresses. Do not allow materials to span control and expansion joints without provision to allow for in-plane wall or partition movement.

B. Form control joints in concrete masonry using one of the following methods:

1. Fit bond-breaker strips into hollow contour in ends of CMUs on one side of control joint. Fill resultant core with grout and rake out joints in exposed faces for application of sealant.
2. Install preformed control-joint gaskets designed to fit standard sash block.
3. Install interlocking units designed for control joints. Install bond-breaker strips at joint. Keep head joints free and clear of mortar or rake out joint for application of sealant.
4. Install temporary foam-plastic filler in head joints and remove filler when unit masonry is complete for application of sealant.

C. Form expansion joints in brick as follows:

1. Build flanges of metal expansion strips into masonry. Lap each joint 4 inches in direction of water flow. Seal joints below grade and at junctures with horizontal expansion joints if any.
2. Build flanges of factory-fabricated, expansion-joint units into masonry.
3. Build in compressible joint fillers where indicated.
4. Form open joint full depth of brick wythe and of width indicated, but not less than 3/8 inch for installation of sealant and backer rod specified in Section 079200 "Joint Sealants."

D. Provide horizontal, pressure-relieving joints by inserting a compressible filler of width required for installing sealant and backer rod specified in Section 079200 "Joint Sealants," but not less than 3/8 inch.

1. Locate horizontal, pressure-relieving joints beneath shelf angles supporting masonry.

## 3.10 LINTELS

A. Install steel lintels where required.

B. Provide concrete or masonry lintels where shown and where openings of more than 12 inches for brick-size units and 24 inches for block-size units are shown without structural steel or other supporting lintels.

C. Provide minimum bearing of 8 inches at each jamb unless otherwise indicated.

## 3.11 FLASHING, WEEP HOLES, CAVITY DRAINAGE, AND VENTS

A. General: Install embedded flashing and weep holes in masonry at shelf angles, lintels, ledges, other obstructions to downward flow of water in wall, and where indicated.

B. Install flashing as follows unless otherwise indicated:

1. Prepare masonry surfaces so they are smooth and free from projections that could puncture flashing. Where flashing is within mortar joint, place through-wall flashing on sloping bed of mortar and cover with mortar. Before covering with mortar, seal penetrations in flashing with adhesive, sealant, or tape as recommended by flashing manufacturer.
2. At masonry-veneer walls, extend flashing through veneer, across air space behind veneer, and up face of sheathing at least 8 inches; with upper edge tucked under building paper or building wrap, lapping at least 4 inches.
3. At lintels and shelf angles, extend flashing a minimum of 6 inches into masonry at each end. At heads and sills, extend flashing 6 inches at ends and turn up not less than 2 inches to form end dams.

C. Install reglets and nailers for flashing and other related construction where they are shown to be built into masonry.

D. Head Joints: Use open-head joints to form weep holes spaced at 24-inches o.c.

## 3.12 REINFORCED UNIT MASONRY INSTALLATION

A. Temporary Formwork and Shores: Construct formwork and shores as needed to support reinforced masonry elements during construction.

1. Construct formwork to provide shape, line, and dimensions of completed masonry as indicated. Make forms sufficiently tight to prevent leakage of mortar and grout. Brace, tie, and support forms to maintain position and shape during construction and curing of reinforced masonry.
2. Do not remove forms and shores until reinforced masonry members have hardened sufficiently to carry their own weight and other loads that may be placed on them during construction.

B. Placing Reinforcement: Comply with requirements in ACI 530.1/ASCE 6/TMS 602.

C. Grouting: Do not place grout until entire height of masonry to be grouted has attained enough strength to resist grout pressure.

1. Comply with requirements in ACI 530.1/ASCE 6/TMS 602 for cleanouts and for grout placement, including minimum grout space and maximum pour height.
2. Limit height of vertical grout pours to not more than 60 inches.

## 3.13 FIELD QUALITY CONTROL

A. Testing and Inspecting: Owner will engage special inspectors to perform tests and inspections and prepare reports. Allow inspectors access to scaffolding and work areas, as needed to perform tests and inspections. Retesting of materials that fail to comply with specified requirements shall be done at Contractor's expense.

B. Inspections: Quality assurance program, Level 2/B per TMS 402-13.

1. Begin masonry construction only after inspectors have verified proportions of site-prepared mortar.
2. Place grout only after inspectors have verified compliance of grout spaces and of grades, sizes, and locations of reinforcement.
3. Place grout only after inspectors have verified proportions of site-prepared grout.

C. Testing Prior to Construction: One set of tests.

D. Testing Frequency: One set of tests for each 5000 sq. ft. of wall area or portion thereof.

E. Concrete Masonry Unit Test: For each type of unit provided, according to ASTM C 140 for compressive strength.

F. Mortar Test (Property Specification): For each mix provided, according to ASTM C 780. Test mortar for mortar air content and compressive strength.

G. Grout Test (Compressive Strength): For each mix provided, according to ASTM C 1019.

## 3.14 REPAIRING, POINTING, AND CLEANING

A. Remove and replace masonry units that are loose, chipped, broken, stained, or otherwise damaged or that do not match adjoining units. Install new units to match adjoining units; install in fresh mortar, pointed to eliminate evidence of replacement.

B. Pointing: During the tooling of joints, enlarge voids and holes, except weep holes, and completely fill with mortar. Point up joints, including corners, openings, and adjacent construction, to provide a neat, uniform appearance. Prepare joints for sealant application, where indicated.

C. In-Progress Cleaning: Clean unit masonry as work progresses by dry brushing to remove mortar fins and smears before tooling joints.

D. Final Cleaning: After mortar is thoroughly set and cured, clean exposed masonry as follows:

1. Remove large mortar particles by hand with wooden paddles and nonmetallic scrape hoes or chisels.

2. Test cleaning methods on sample wall panel; leave one-half of panel uncleaned for comparison purposes. Obtain Architect's approval of sample cleaning before proceeding with cleaning of masonry.
3. Protect adjacent stone and nonmasonry surfaces from contact with cleaner by covering them with liquid strippable masking agent or polyethylene film and waterproof masking tape.
4. Wet wall surfaces with water before applying cleaners; remove cleaners promptly by rinsing surfaces thoroughly with clear water.
5. Clean brick by bucket-and-brush hand-cleaning method described in BIA Technical Notes 20.
6. Clean masonry with a proprietary non-acidic cleaner applied according to manufacturer's written instructions.
7. Clean concrete masonry by cleaning method indicated in NCMA TEK 8-2A applicable to type of stain on exposed surfaces.

## 3.15 MASONRY WASTE DISPOSAL

A. Salvageable Materials: Unless otherwise indicated, excess masonry materials are Contractor's property. At completion of unit masonry work, remove from Project site.

END OF SECTION 042000

# SECTION 051200 - STRUCTURAL STEEL FRAMING

## PART 1 - GENERAL

### 1.1 SUMMARY

A. Section Includes:

1. Structural steel.
2. Shrinkage-resistant grout.

B. Related Requirements:

1. Section 053100 "Steel Decking" for field installation of shear stud connectors through deck.
2. Section 055000 "Metal Fabrications" for steel lintels and shelf angles not attached to structural-steel frame, miscellaneous steel fabrications and other steel items not defined as structural steel.
3. Section 099113 "Exterior Painting" and Section 099123 "Interior Painting" and Section 099600 "High-Performance Coatings" for painting requirements.

### 1.2 DEFINITIONS

A. Structural Steel: Elements of the structural frame indicated on Drawings and as described in ANSI/AISC 303.

### 1.3 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.

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.

C. Contractor shall make provisions for a “Beam Signing Ceremony” to be attended by students, staff, and key construction personnel. At a time mutually agreeable to Owner and Contractor, provide one beam, painted white, at an area accessible for all participants designated by the Owner to sign.

### 1.4 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site.

1.5 ACTION SUBMITTALS

A. Product Data:

1. Structural-steel materials.
2. High-strength, bolt-nut-washer assemblies.
3. Shear stud connectors.
4. Anchor rods.
5. Threaded rods.
6. Shop primer.
7. Galvanized-steel primer.
8. Etching cleaner.
9. Galvanized repair paint.
10. Shrinkage-resistant grout.

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.
5. Identify members not to be shop primed.

C. Delegated Design Submittal: For structural-steel connections indicated on Drawings to comply with design loads, design criteria, and structural general notes. Standard connections to be selected by the steel Fabricator's Steel Detailer in conformance with the requirements of the AISC Manual of Steel Construction and the AISC Code of Standard Practice.

1.6 INFORMATIONAL SUBMITTALS

A. Qualification Data: For Installer, fabricator, shop-painting applicators, and testing agency.

B. Welding certificates.

C. Paint Compatibility Certificates: From manufacturers of topcoats applied over shop primers, certifying that shop primers are compatible with topcoats.

D. Survey of existing conditions.

E. Field quality-control reports.

1.7 QUALITY ASSURANCE

A. Comply with the applicable provisions of the following specifications and documents:

1. AISC 303
2. AISC 360
3. RCSC's "Specification for Structural Joints Using ASTM A325 or A490 Bolts"
4. AWS D1.1

B. Fabricator Qualifications: A qualified fabricator that participates in a Quality Certification Program.

C. Installer Qualifications: A qualified Installer who participates in a Quality Certification Program.

D. Welding Qualifications: Qualify procedures and personnel in accordance with AWS D1.1.

1.8 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 F3125/F3125M, Grade F1852 bolt assemblies and for retesting bolt assemblies after lubrication.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Comply with applicable provisions of the following specifications and documents:

1. ANSI/AISC 303.
2. ANSI/AISC 360.
3. RCSC's "Specification for Structural Joints Using High-Strength Bolts."

B. Connection Design Information:

1. Option 2: Fabricator's experienced steel detailer shall select or complete connections in accordance with AISC 303 and AISC 360.

a. Select and complete connections using schematic details indicated and AISC 360.

C. Moment Connections: Type FR, fully restrained.

D. Construction: Shear wall system.

## 2.2 STRUCTURAL-STEEL MATERIALS

A. W-Shapes: ASTM A992 Grade 50.

B. Channels and Angles: ASTM A36 Grade 36.

C. Plate and Bar: ASTM A36 Grade 36.

D. Cold-Formed Hollow Structural Sections: ASTM A500 Grade B structural tubing.

E. Steel Pipe: ASTM A53/A53M, Grade B.

F. Welding Electrodes: Comply with AWS requirements.

## 2.3 BOLTS AND CONNECTORS

A. High-Strength A325 Bolts, Nuts, and Washers: ASTM F3125/F3125M, Grade A325 (Grade A325M), Type 1, heavy-hex steel structural bolts; ASTM A563, Grade DH (ASTM A563M, Class 10S), heavy-hex carbon-steel nuts; and ASTM F436/F436M, Type 1, hardened carbon-steel washers; all with plain finish.

B. Tension-Control, High-Strength Bolt-Nut-Washer Assemblies: ASTM F3125/F3125M, Grade F1852, Type 1, heavy-hex or round head assemblies, consisting of steel structural bolts with splined ends; ASTM A563, Grade DH (ASTM A563M, Class 10S), heavy-hex carbon-steel nuts; and ASTM F436/F436M, Type 1, hardened carbon-steel washers.

C. Shear Stud Connectors: ASTM A108, AISI C-1015 through C-1020, headed-stud type, cold-finished carbon steel; AWS D1.1/D1.1M, Type B.

## 2.4 RODS

A. Headed Anchor Rods: ASTM F1554, Grade 36, straight.

1. Nuts: ASTM A563 (ASTM A563M) heavy-hex carbon steel.
2. Plate Washers: ASTM A36/A36M carbon steel.
3. Washers: ASTM F436 (ASTM F436M), Type 1, hardened carbon steel.
4. Finish: Plain.

B. Threaded Rods: ASTM A36.

1. Nuts: ASTM A63 (ASTM A563M) heavy-hex carbon steel.
2. Washers: ASTM F436 (ASTM F436M), Type 1, hardened or ASTM A36 carbon steel.
3. Finish: Plain.

2.5 PRIMER

A. Steel Primer:

1. Comply with Section 099113 "Exterior Painting," Section 099123 "Interior Painting," and Section 099600 "High-Performance Coatings."
2. Fabricator's standard lead- and chromate-free, nonasphaltic, rust-inhibiting primer complying with MPI#79 and compatible with topcoat.

B. Galvanized-Steel Primer:

1. Etching Cleaner: MPI#25, for galvanized steel.
2. Galvanizing Repair Paint: MPI#18, MPI#19, or SSPC-Paint 20 ASTM A780.

2.6 SHRINKAGE-RESISTANT GROUT

A. Nonmetallic, Shrinkage-Resistant Grout: ASTM C1107/C1107M, factory-packaged, nonmetallic aggregate grout, noncorrosive and nonstaining, mixed with water to consistency suitable for application and a 30-minute working time.

2.7 FABRICATION

A. Structural Steel: Fabricate and assemble in shop to greatest extent possible. Fabricate in accordance with ANSI/AISC 303 and to ANSI/AISC 360.

1. Camber structural-steel members where indicated.
2. Fabricate beams with rolling camber up.
3. Identify high-strength structural steel in accordance with ASTM A6/A6M and maintain markings until structural-steel framing 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 in accordance with SSPC-SP 3.

F. Shear Stud Connectors: Prepare steel surfaces as recommended by manufacturer of shear connectors. Weld using automatic end welding of headed-stud shear connectors in accordance with AWS D1.1/D1.1M and manufacturer's written instructions.

G. Steel Wall-Opening Framing: Select true and straight members for fabricating steel wall-opening framing to be attached to structural-steel frame. Straighten as required to provide uniform, square, and true members in completed wall framing. Build up welded framing, weld exposed joints continuously, and grind smooth.

H. Welded-Steel Door Frames: Build up welded-steel door frames attached to structural-steel frame. Weld exposed joints continuously and grind smooth. Plug-weld fixed steel bar stops to frames. Secure removable stops to frames with countersunk machine screws, uniformly spaced not more than 10 inches (250 mm) o.c. unless otherwise indicated on Drawings.

I. Holes: Provide holes required for securing other work to structural steel and for other work to pass through steel members.

1. Cut, drill, or punch holes perpendicular to steel surfaces. Do not thermally cut bolt holes or enlarge holes by burning.
2. Baseplate Holes: Cut, drill, mechanically thermal cut, or punch holes perpendicular to steel surfaces.
3. Weld threaded nuts to framing and other specialty items indicated to receive other work.

## 2.8 SHOP CONNECTIONS

A. High-Strength Bolts: Shop install high-strength bolts in accordance with RCSC's "Specification for Structural Joints Using High-Strength Bolts" for type of bolt and type of joint specified.

1. Joint Type: Snug tightened, Pretensioned.

B. Weld Connections: Comply with AWS D1.1 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 maintain true alignment of axes without exceeding tolerances in ANSI/AISC 303 for mill material.

## 2.9 GALVANIZING

A. Hot-Dip Galvanized Finish: Apply zinc coating by the hot-dip process to structural steel in accordance with ASTM A123/A123M.

1. Fill vent and drain holes that are exposed in the finished Work unless they function as weep holes, by plugging with zinc solder and filing off smooth.
2. Galvanize all steel permanently exposed to weather and all lintels in exterior walls. Coordinate cleaning of steel after galvanizing with finished coating, comply with Section 099113 "Exterior Painting," Section 099123 "Interior Painting," and Section 099600 "High-Performance Coatings."

## 2.10 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 of high-strength bolted, slip-critical connections.
4. Surfaces to receive sprayed fire-resistive materials (applied fireproofing).
5. Galvanized surfaces unless indicated to be painted.
6. Corrosion-resisting (weathering) steel surfaces.
7. Surfaces enclosed in interior construction.

B. Surface Preparation of Steel: Clean surfaces to be painted. Remove loose rust and mill scale and spatter, slag, or flux deposits. Prepare surfaces in accordance with the following specifications and standards:

1. SSPC-SP 3.

C. Surface Preparation of Galvanized Steel: Prepare galvanized-steel surfaces for shop priming by thoroughly cleaning steel of grease, dirt, oil, flux, and other foreign matter, and treating with etching cleaner or in accordance with SSPC-SP 16.

D. Priming: Immediately after surface preparation, apply primer in accordance with 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.

## 2.11 SOURCE QUALITY CONTROL

A. Testing Agency: Owner will engage a qualified testing agency to perform shop tests and inspections.

1. Allow testing agency access to places where structural-steel work is being fabricated or produced to perform tests and inspections.
2. Bolted Connections: Inspect shop-bolted connections in accordance with RCSC's "Specification for Structural Joints Using High-Strength Bolts."
3. Welded Connections: Visually inspect shop-welded connections in accordance with AWS D1.1.
4. In addition to visual inspection, test and inspect shop-welded shear stud connectors in accordance with requirements in AWS D1.1/D1.1M for stud welding and as follows:

    a. Perform bend tests if visual inspections reveal either a less-than-continuous 360-degree flash or welding repairs to any shear stud connector.
    b. Conduct tests in accordance with requirements in AWS D1.1/D1.1M on additional shear stud connectors if weld fracture occurs on shear stud connectors already tested.

5. Prepare test and inspection reports.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify, with certified 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 existing conditions. Include 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 on Drawings.

1. Do not remove temporary shoring supporting composite deck construction and structural-steel framing 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 in accordance with ANSI/AISC 303 and ANSI/AISC 360.

B. Baseplates, Bearing Plates 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 shrinkage-resistant 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 grouting.

C. Maintain erection tolerances of structural steel within ANSI/AISC 303.

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 are in permanent contact with members. Perform necessary adjustments to compensate for discrepancies in elevations and alignment.

1. Level and plumb individual members of structure. Slope roof framing members to slopes indicated on Drawings.
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 unless approved by Architect. Finish thermally cut sections within smoothness limits in AWS D1.1/D1.1M.

G. Do not enlarge unfair holes in members by burning or using drift pins. Ream holes that must be enlarged to admit bolts.

## 3.4 FIELD CONNECTIONS

A. High-Strength Bolts: Install high-strength bolts in accordance with RCSC's "Specification for Structural Joints Using High-Strength Bolts" for bolt and joint type specified.

1. Joint Type: Snug tightened, Pretensioned.

B. Weld Connections: Comply with AWS D1.1 for tolerances, appearances, welding procedure specifications, weld quality, and methods used in correcting welding work.

1. Comply with ANSI/AISC 303 and ANSI/AISC 360 for bearing, alignment, adequacy of temporary connections, and removal of paint on surfaces adjacent to field welds.
2. Remove backing bars or runoff tabs where indicated, back gouge, and grind steel smooth.
3. Assemble and weld built-up sections by methods that maintain true alignment of axes without exceeding tolerances in ANSI/AISC 303 for mill material.

C. Shear Stud Connectors: Prepare steel surfaces as recommended by manufacturer of shear connectors. Weld using end welding of headed-stud shear connectors in accordance with AWS D1.1/D1.1M and manufacturer's written instructions.

## 3.5 REPAIR

A. Galvanized Surfaces: Clean areas where galvanizing is damaged or missing, and repair galvanizing to comply with ASTM A780/A780M.

B. Touchup Painting:

1. 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.

a. Clean and prepare surfaces by SSPC-SP 2 hand-tool cleaning or SSPC-SP 3 power-tool cleaning.

2. Cleaning and touchup painting are specified in Section 099113 "Exterior Painting.", Section 099123 "Interior Painting.", and Section 099600 "High-Performance Coatings."

C. Touchup Priming: Cleaning and touchup priming are specified in Section 099600 "High-Performance Coatings."

## 3.6 FIELD QUALITY CONTROL

A. Special Inspections: Owner will engage a special inspector to perform the following special inspections:

1. Verify structural-steel materials and inspect steel frame joint details.
2. Verify weld materials and inspect welds.
3. Verify connection materials and inspect high strength bolted connections.

B. Testing Agency: Owner will engage a qualified testing agency to perform tests and inspections.

1. Bolted Connections: Inspect bolted connections in accordance with RCSC's "Specification for Structural Joints Using High-Strength Bolts."
2. Welded Connections: Visually inspect field welds in accordance with AWS D1.1/D1.1M.
3. Shear Stud Connectors: 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:

a. Perform bend tests if visual inspections reveal either a less-than-continuous 360-degree flash or welding repairs to any shear connector.
b. Conduct tests according to requirements in AWS D1.1/D1.1M on additional shear connectors if weld fracture occurs on shear connectors already tested.

END OF SECTION 051200

# SECTION 079200 - JOINT SEALANTS

## 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. Section Includes:

1. Nonstaining silicone joint sealants.
2. Mildew-resistant joint sealants.
3. Latex joint sealants.

### 1.3 ACTION SUBMITTALS

A. Product Data: For each joint-sealant product.

B. Samples for Initial Selection: Manufacturer's color charts consisting of strips of cured sealants showing the full range of colors available for each product exposed to view.

### 1.4 QUALITY ASSURANCE

A. Mockups: Install sealant in mockups of assemblies specified in other Sections that are indicated to receive joint sealants specified in this Section. Use materials and installation methods specified in this Section.

### 1.5 FIELD CONDITIONS

A. Do not proceed with installation of joint sealants under the following conditions:

1. When ambient and substrate temperature conditions are outside limits permitted by joint-sealant manufacturer or are below 40 deg F.
2. When joint substrates are wet.
3. Where joint widths are less than those allowed by joint-sealant manufacturer for applications indicated.
4. Where contaminants capable of interfering with adhesion have not yet been removed from joint substrates.

1.6 WARRANTY

A. Special Installer's Warranty: Installer agrees to repair or replace joint sealants that do not comply with performance and other requirements specified in this Section within specified warranty period.

1. Warranty Period: Two years from date of Substantial Completion.

B. Special warranties specified in this article exclude deterioration or failure of joint sealants from the following:

1. Movement of the structure caused by stresses on the sealant exceeding sealant manufacturer's written specifications for sealant elongation and compression.
2. Disintegration of joint substrates from causes exceeding design specifications.
3. Mechanical damage caused by individuals, tools, or other outside agents.
4. Changes in sealant appearance caused by accumulation of dirt or other atmospheric contaminants.

PART 2 - PRODUCTS

2.1 JOINT SEALANTS, GENERAL

A. Compatibility: Provide joint sealants, backings, and other related materials that are compatible with one another and with joint substrates under conditions of service and application, as demonstrated by joint-sealant manufacturer, based on testing and field experience.

B. VOC Content of Interior Sealants: Sealants and sealant primers used inside the weatherproofing system shall comply with the following:

1. Architectural sealants shall have a VOC content of 250 g/L or less.
2. Sealants and sealant primers for nonporous substrates shall have a VOC content of 250 g/L or less.

C. Colors of Exposed Joint Sealants: As selected by Architect from manufacturer's full range.

2.2 NONSTAINING SILICONE JOINT SEALANTS

A. Nonstaining Joint Sealants: No staining of substrates when tested according to ASTM C 1248.

B. Silicone, Nonstaining, S, NS, 50, NT: Nonstaining, single-component, nonsag, plus 50 percent and minus 50 percent movement capability, nontraffic-use, neutral-curing silicone joint sealant; ASTM C 920, Type S, Grade NS, Class 50, Use NT.

1. Products: Subject to compliance with requirements, provide one of the following:

a. Dow Corning Corporation; 756 SMS or 795.

b. GE Construction Sealants; SilPruf NB.
c. Pecora Corporation; 864 NST.
d. Tremco Incorporated; Spectrem 3.

2.3 MILDEW-RESISTANT JOINT SEALANTS

A. Mildew-Resistant Joint Sealants: Formulated for prolonged exposure to humidity with fungicide to prevent mold and mildew growth.

B. Silicone, Mildew Resistant, Acid Curing, S, NS, 25, NT: Mildew-resistant, single-component, nonsag, plus 25 percent and minus 25 percent movement capability, nontraffic-use, acid-curing silicone joint sealant; ASTM C 920, Type S, Grade NS, Class 25, Use NT.

1. Products: Subject to compliance with requirements, provide one of the following:

a. Dow Corning Corporation; 786-M White.
b. GE Construction Sealants; SCS1700 Sanitary.
c. Tremco Incorporated; Tremsil 200.

2.4 LATEX JOINT SEALANTS

A. Acrylic Latex: Acrylic latex or siliconized acrylic latex, ASTM C 834, Type OP, Grade NF.

1. Products: Subject to compliance with requirements, provide one of the following:

a. Master Builders Solutions; MasterSeal NP 520.
b. Pecora Corporation; AC-20.
c. Sherwin-Williams Company (The); 850A.
d. Tremco Incorporated; Tremflex 834.

2.5 JOINT-SEALANT BACKING

A. Sealant Backing Material, General: Nonstaining; compatible with joint substrates, sealants, primers, and other joint fillers; and approved for applications indicated by sealant manufacturer based on field experience and laboratory testing.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. BASF Construction Chemicals, LLC, Building Systems.
b. Construction Foam Products, a division of Nomaco, Inc.

B. Cylindrical Sealant Backings: ASTM C 1330, Type C (closed-cell material with a surface skin) or Type O (open-cell material), and of size and density to control sealant depth and otherwise contribute to producing optimum sealant performance. Use open-cell material at double caulk beads in vertical joints for curing of initial (internal) caulk bead.

C. Bond-Breaker Tape: Polyethylene tape or other plastic tape recommended by sealant manufacturer for preventing sealant from adhering to rigid, inflexible joint-filler materials or joint surfaces at back of joint. Provide self-adhesive tape where applicable.

2.6 MISCELLANEOUS MATERIALS

A. Primer: Material recommended by joint-sealant manufacturer where required for adhesion of sealant to joint substrates indicated, as determined from preconstruction joint-sealant-substrate tests and field tests.

B. Cleaners for Nonporous Surfaces: Chemical cleaners acceptable to manufacturers of sealants and sealant backing materials, free of oily residues or other substances capable of staining or harming joint substrates and adjacent nonporous surfaces in any way, and formulated to promote optimum adhesion of sealants to joint substrates.

C. Masking Tape: Nonstaining, nonabsorbent material compatible with joint sealants and surfaces adjacent to joints.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine joints indicated to receive joint sealants, with Installer present, for compliance with requirements for joint configuration, installation tolerances, and other conditions affecting performance of the Work.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Surface Cleaning of Joints: Clean out joints immediately before installing joint sealants to comply with joint-sealant manufacturer's written instructions and the following requirements:

1. Remove all foreign material from joint substrates that could interfere with adhesion of joint sealant, including dust, paints (except for permanent, protective coatings tested and approved for sealant adhesion and compatibility by sealant manufacturer), old joint sealants, oil, grease, waterproofing, water repellents, water, surface dirt, and frost.
2. Remove laitance and form-release agents from concrete.

B. Joint Priming: Prime joint substrates where recommended by joint-sealant manufacturer or as indicated by preconstruction joint-sealant-substrate tests or prior experience. Apply primer to comply with joint-sealant manufacturer's written instructions. Confine primers to areas of joint-sealant bond; do not allow spillage or migration onto adjoining surfaces.

C. Masking Tape: Use masking tape where required to prevent contact of sealant or primer with adjoining surfaces that otherwise would be permanently stained or damaged by such contact or by cleaning methods required to remove sealant smears. Remove tape immediately after tooling without disturbing joint seal.

## 3.3 INSTALLATION OF JOINT SEALANTS

A. General: Comply with joint-sealant manufacturer's written installation instructions for products and applications indicated, unless more stringent requirements apply.

B. Sealant Installation Standard: Comply with recommendations in ASTM C 1193 for use of joint sealants as applicable to materials, applications, and conditions indicated.

C. Install sealant backings of kind indicated to support sealants during application and at position required to produce cross-sectional shapes and depths of installed sealants relative to joint widths that allow optimum sealant movement capability.

1. Do not leave gaps between ends of sealant backings.
2. Do not stretch, twist, puncture, or tear sealant backings.
3. Remove absorbent sealant backings that have become wet before sealant application and replace them with dry materials.

D. Install bond-breaker tape behind sealants where sealant backings are not used between sealants and backs of joints.

E. Install sealants using proven techniques that comply with the following and at the same time backings are installed:

1. Place sealants so they directly contact and fully wet joint substrates.
2. Completely fill recesses in each joint configuration.
3. Produce uniform, cross-sectional shapes and depths relative to joint widths that allow optimum sealant movement capability.

F. Tooling of Nonsag Sealants: Immediately after sealant application and before skinning or curing begins, tool sealants according to requirements specified in subparagraphs below to form smooth, uniform beads of configuration indicated; to eliminate air pockets; and to ensure contact and adhesion of sealant with sides of joint.

1. Remove excess sealant from surfaces adjacent to joints.
2. Use tooling agents that are approved in writing by sealant manufacturer and that do not discolor sealants or adjacent surfaces.
3. Provide concave joint profile per Figure 8A in ASTM C 1193 unless otherwise indicated.

## 3.4 FIELD QUALITY CONTROL

A. Field-Adhesion Testing: Field test joint-sealant adhesion to joint substrates as follows:

1. Extent of Testing: Test completed and cured sealant joints as follows:

a. Perform 10 tests for the first 1000 feet of joint length for each kind of sealant and joint substrate.
b. Perform one test for each 1000 feet of joint length thereafter or one test per each floor per elevation.

2. Test Method: Test joint sealants according to Method A, Field-Applied Sealant Joint Hand Pull Tab, in Appendix X1 in ASTM C 1193 or Method A, Tail Procedure, in ASTM C 1521.

a. For joints with dissimilar substrates, verify adhesion to each substrate separately; extend cut along one side, verifying adhesion to opposite side. Repeat procedure for opposite side.

3. Inspect tested joints and report on the following:

a. Whether sealants filled joint cavities and are free of voids.
b. Whether sealant dimensions and configurations comply with specified requirements.
c. Whether sealants in joints connected to pulled-out portion failed to adhere to joint substrates or tore cohesively. Include data on pull distance used to test each kind of product and joint substrate. Compare these results to determine if adhesion complies with sealant manufacturer's field-adhesion hand-pull test criteria.

4. Record test results in a field-adhesion-test log. Include dates when sealants were installed, names of persons who installed sealants, test dates, test locations, whether joints were primed, adhesion results and percent elongations, sealant material, sealant configuration, and sealant dimensions.
5. Repair sealants pulled from test area by applying new sealants following same procedures used originally to seal joints. Ensure that original sealant surfaces are clean and that new sealant contacts original sealant.

B. Evaluation of Field-Adhesion-Test Results: Sealants not evidencing adhesive failure from testing or noncompliance with other indicated requirements will be considered satisfactory. Remove sealants that fail to adhere to joint substrates during testing or to comply with other requirements. Retest failed applications until test results prove sealants comply with indicated requirements.

## 3.5 CLEANING

A. Clean off excess sealant or sealant smears adjacent to joints as the Work progresses by methods and with cleaning materials approved in writing by manufacturers of joint sealants and of products in which joints occur.

3.6 PROTECTION

A. Protect joint sealants during and after curing period from contact with contaminating substances and from damage resulting from construction operations or other causes so sealants are without deterioration or damage at time of Substantial Completion. If, despite such protection, damage or deterioration occurs, cut out, remove, and repair damaged or deteriorated joint sealants immediately so installations with repaired areas are indistinguishable from original work.

3.7 JOINT-SEALANT SCHEDULE

A. Joint-Sealant Application: Exterior joints in vertical surfaces and horizontal nontraffic surfaces.

1. Joint Locations:

a. Joints in unit masonry.
b. Perimeter joints between materials listed above and frames of doors and windows.
c. Other joints as indicated on Drawings.

2. Joint Sealant: Silicone, nonstaining, S, NS, 50, NT.
3. Joint-Sealant Color: As selected by Architect from manufacturer's full range of colors.

B. Joint-Sealant Application: Interior joints in vertical surfaces and horizontal nontraffic surfaces not subject to significant movement.

1. Joint Locations:

a. Control joints on exposed interior surfaces of exterior walls.
b. Perimeter joints between interior wall surfaces and frames of interior doors.
c. Other joints as indicated on Drawings.

2. Joint Sealant: Acrylic latex.
3. Joint-Sealant Color: As selected by Architect from manufacturer's full range of colors.

C. Joint-Sealant Application: Mildew-resistant interior joints in vertical surfaces and horizontal nontraffic surfaces.

1. Joint Locations:

a. Joints between plumbing fixtures and adjoining walls, floors, and counters.
b. Other joints in wet areas as indicated on Drawings.

2. Joint Sealant: Silicone, mildew resistant, acid curing, S, NS, 25, NT.
3. Joint-Sealant Color: As selected by Architect from manufacturer's full range of colors.

END OF SECTION 079200

# SECTION 099113 - EXTERIOR PAINTING

## 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. Section includes surface preparation and the application of paint systems on exterior substrates.

### 1.3 DEFINITIONS

A. MPI Gloss Level 3: 10 to 25 units at 60 degrees and 10 to 35 units at 85 degrees, according to ASTM D 523.

### 1.4 ACTION SUBMITTALS

A. Product Data: For each type of product. Include preparation requirements and application instructions.

1. Include printout of current "MPI Approved Products List" for each product category specified, with the proposed product highlighted.

B. Samples for Initial Selection: For each type of topcoat product.

C. Product List: Cross-reference to paint system and locations of application areas. Use same designations indicated on Drawings and in schedules. Include color designations.

### 1.5 MAINTENANCE MATERIAL SUBMITTALS

A. Furnish extra materials, from the same product run, that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

1. Paint: 5 percent, but not less than 1 gal. of each material and color applied.

### 1.6 DELIVERY, STORAGE, AND HANDLING

A. Store materials not in use in tightly covered containers in well-ventilated areas with ambient temperatures continuously maintained at not less than 45 deg F.

1. Maintain containers in clean condition, free of foreign materials and residue.
2. Remove rags and waste from storage areas daily.

1.7 FIELD CONDITIONS

A. Apply paints only when temperature of surfaces to be painted and ambient air temperatures are between 50 and 95 deg F.

B. Do not apply paints in snow, rain, fog, or mist; when relative humidity exceeds 85 percent; at temperatures less than 5 deg F above the dew point; or to damp or wet surfaces.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, provide specified products by one of the following:

1. Behr Process Corporation.
2. Benjamin Moore & Co.
3. PPG Architectural Coatings.
4. Sherwin-Williams Company (The).

2.2 PAINT, GENERAL

A. MPI Standards: Products shall comply with MPI standards indicated and shall be listed in its "MPI Approved Products Lists."

B. Material Compatibility:

1. Materials for use within each paint system shall be compatible with one another and substrates indicated, under conditions of service and application as demonstrated by manufacturer, based on testing and field experience.
2. For each coat in a paint system, products shall be recommended in writing by topcoat manufacturers for use in paint system and on substrate indicated.

C. VOC Content: Products shall comply with VOC limits of authorities having jurisdiction.

D. Colors: As selected by Architect from manufacturer's full range.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates and conditions, with Applicator present, for compliance with requirements for maximum moisture content and other conditions affecting performance of the Work.

B. Verify suitability of substrates, including surface conditions and compatibility, with existing finishes and primers.

C. Proceed with coating application only after unsatisfactory conditions have been corrected.

1. Application of coating indicates acceptance of surfaces and conditions.

3.2 PREPARATION

A. Comply with manufacturer's written instructions and recommendations in "MPI Architectural Painting Specification Manual" applicable to substrates and paint systems indicated.

B. Remove hardware, covers, plates, and similar items already in place that are removable and are not to be painted. If removal is impractical or impossible because of size or weight of item, provide surface-applied protection before surface preparation and painting.

1. After completing painting operations, use workers skilled in the trades involved to reinstall items that were removed. Remove surface-applied protection.

C. Clean substrates of substances that could impair bond of paints, including dust, dirt, oil, grease, and incompatible paints and encapsulants.

1. Remove incompatible primers and reprime substrate with compatible primers or apply tie coat as required to produce paint systems indicated.

D. Steel Substrates: Remove rust, loose mill scale, and shop primer if any. Clean using methods recommended in writing by paint manufacturer.

3.3 APPLICATION

A. Apply paints according to manufacturer's written instructions and recommendations in "MPI Architectural Painting Specification Manual."

1. Use applicators and techniques suited for paint and substrate indicated.
2. Paint surfaces behind movable items same as similar exposed surfaces. Before final installation, paint surfaces behind permanently fixed items with prime coat only.
3. Paint both sides and edges of exterior doors and entire exposed surface of exterior door frames.

4. Paint entire exposed surface of window frames and sashes.
5. Do not paint over labels of independent testing agencies or equipment name, identification, performance rating, or nomenclature plates.
6. Primers specified in painting schedules may be omitted on items that are factory primed or factory finished if acceptable to topcoat manufacturers.

B. Tint undercoats same color as topcoat, but tint each undercoat a lighter shade to facilitate identification of each coat if multiple coats of same material are to be applied. Provide sufficient difference in shade of undercoats to distinguish each separate coat.

C. If undercoats or other conditions show through topcoat, apply additional coats until cured film has a uniform paint finish, color, and appearance.

D. Apply paints to produce surface films without cloudiness, spotting, holidays, laps, brush marks, roller tracking, runs, sags, ropiness, or other surface imperfections. Cut in sharp lines and color breaks.

## 3.4 FIELD QUALITY CONTROL

A. Dry Film Thickness Testing: Owner may engage the services of a qualified testing and inspecting agency to inspect and test paint for dry film thickness.

1. Contractor shall touch up and restore painted surfaces damaged by testing.
2. If test results show that dry film thickness of applied paint does not comply with paint manufacturer's written recommendations, Contractor shall pay for testing and apply additional coats as needed to provide dry film thickness that complies with paint manufacturer's written recommendations.

## 3.5 CLEANING AND PROTECTION

A. At end of each workday, remove rubbish, empty cans, rags, and other discarded materials from Project site.

B. After completing paint application, clean spattered surfaces. Remove spattered paints by washing, scraping, or other methods. Do not scratch or damage adjacent finished surfaces.

C. Protect work of other trades against damage from paint application. Correct damage to work of other trades by cleaning, repairing, replacing, and refinishing, as approved by Architect, and leave in an undamaged condition.

D. At completion of construction activities of other trades, touch up and restore damaged or defaced painted surfaces.

## 3.6 EXTERIOR PAINTING SCHEDULE

A. Steel and Iron Substrates:

1. Alkyd System:

a. Prime Coat: Primer, alkyd, anticorrosive, for metal.

1) BEHR: Premium Plus Multi-Surface Primer, 436 (<50 g/L).
2) BM: Super Spec Alkyd Metal Primer P06.
3) PPG Paints: Multiprime 4360 (<338 g/L).
4) S-W: Kem Bond HS, B50 Series.

b. Topcoat: Alkyd, exterior, semi-gloss (MPI Gloss Level 5).

1) BEHR: Oil-Base Interior/Exterior Semi-Gloss Enamel, 3900 (<350 g/L).
2) BM: Super Spec HP Alkyd Semi-Gloss Enamel P24.
3) PPG Paints: Urethane Alkyd 4336 Semi-Gloss Enamel (<328 g/L).
4) S-W: Metalatex DTM, B55 Series.

B. Galvanized-Metal Substrates:

1. Latex System:

a. Prime Coat: Primer, galvanized, water based.

1) BEHR: Behr Interior/Exterior Metal Primer, 435. (<50 g/L).
2) BM: Ultra Spec Acrylic Metal Primer HP04 (45g/L).
3) PPG Paints: Pitt-Tech Plus Waterborne Acrylic Primer/Finish 4020PF (<91 g/L).
4) S-W: Pro Industrial ProCryl WB Metal Primer, B66-310 Series.

b. Topcoat: Latex, exterior, semi-gloss (MPI Gloss Level 5).

1) BEHR: Behr Direct To Metal Semi-Gloss, 3200. (<50 g/L).
2) BM: Ultra Spec EXT Satin Finish N448 (46g/L).
3) PPG Paints: Pitt-Tech Plus Waterborne Acrylic Semi-Gloss 4216 Series (<91 g/L).
4) S-W: Pro Industrial Acrylic Semi-Gloss, B66-651 Series.

END OF SECTION 099113

DSSECTION 099600 - HIGH-PERFORMANCE COATINGS

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. Section includes surface preparation and the application of a three coat high-performance coating systems on the following substrates:

1. Exterior Substrates:

a. Clay masonry.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product. Include preparation requirements and application instructions.

1. Indicate VOC content.

B. Samples for Initial Selection: For each type of topcoat product indicated.

1.4 MAINTENANCE MATERIAL SUBMITTALS

A. Furnish extra materials, from the same product run, that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

1. Coatings: 5 percent, but not less than 1 gal. of each material and color applied.

1.5 QUALITY ASSURANCE

A. Mockups: Apply mockups of each coating system indicated to verify preliminary selections made under Sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution.

1. Architect will select one surface to represent surfaces and conditions for application of each coating system.

a. Wall Surfaces: Provide samples of at least 100 sq. ft.

2. Final approval of color selections will be based on mockups.

    a. If preliminary color selections are not approved, apply additional mockups of additional colors selected by Architect at no added cost to Owner.

3. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.
4. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Store materials not in use in tightly covered containers in well-ventilated areas with ambient temperatures continuously maintained at not less than 45 deg F.

1. Maintain containers in clean condition, free of foreign materials and residue.
2. Remove rags and waste from storage areas daily.

1.7 FIELD CONDITIONS

A. Apply coatings only when temperature of surfaces to be coated and ambient air temperatures are between 50 and 95 deg F.

B. Do not apply coatings when relative humidity exceeds 85 percent; at temperatures less than 5 deg F above the dew point; or to damp or wet surfaces.

C. Do not apply exterior coatings in snow, rain, fog, or mist.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Products: Subject to compliance with requirements, provide product listed in the High-Performance Coating Schedule for the coating category indicated. No substitutions will be permitted.

2.2 HIGH-PERFORMANCE COATINGS, GENERAL

A. Material Compatibility:

1. Materials for use within each paint system shall be compatible with one another and substrates indicated, under conditions of service and application as demonstrated by manufacturer, based on testing and field experience.
2. For each coat in a paint system, products shall be recommended in writing by topcoat manufacturers for use in paint system and on substrate indicated.
3. Products shall be of same manufacturer for each coat in a coating system.

B. Colors: As selected by Architect from manufacturer's full range.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

A. Examine substrates and conditions, with Applicator present, for compliance with requirements for other conditions affecting performance of the Work.

B. Verify suitability of substrates, including surface conditions and compatibility, with existing finishes and primers.

C. Proceed with coating application only after unsatisfactory conditions have been corrected.

1. Application of coating indicates acceptance of surfaces and conditions.

### 3.2 PREPARATION

A. Comply with manufacturer's written instructions and recommendations in "MPI Architectural Painting Specification Manual" applicable to substrates and coating systems indicated.

B. Clean substrates of substances that could impair bond of coatings, including dust, dirt, oil, grease, and incompatible paints and encapsulants.

### 3.3 APPLICATION

A. Apply high-performance coatings according to manufacturer's written instructions and recommendations in "MPI Architectural Painting Specification Manual."

1. Use applicators and techniques suited for coating and substrate indicated.

B. Tint each undercoat a lighter shade to facilitate identification of each coat if multiple coats of the same material are to be applied. Tint undercoats to match color of finish coat, but provide sufficient difference in shade of undercoats to distinguish each separate coat.

C. If undercoats or other conditions show through final coat, apply additional coats until cured film has a uniform coating finish, color, and appearance.

D. Apply coatings to produce surface films without cloudiness, spotting, holidays, laps, brush marks, runs, sags, ropiness, or other surface imperfections. Produce sharp glass lines and color breaks.

## 3.4 FIELD QUALITY CONTROL

A. Dry Film Thickness Testing: Owner may engage the services of a qualified testing and inspecting agency to inspect and test coatings for dry film thickness.

1. Contractor shall touch up and restore coated surfaces damaged by testing.
2. If test results show that dry film thickness of applied coating does not comply with coating manufacturer's written recommendations, Contractor shall pay for testing and apply additional coats as needed to provide dry film thickness that complies with coating manufacturer's written recommendations.

## 3.5 CLEANING AND PROTECTION

A. At end of each workday, remove rubbish, empty cans, rags, and other discarded materials from Project site.

B. After completing coating application, clean spattered surfaces. Remove spattered coatings by washing, scraping, or other methods. Do not scratch or damage adjacent finished surfaces.

C. Protect work of other trades against damage from coating operation. Correct damage to work of other trades by cleaning, repairing, replacing, and recoating, as approved by Architect, and leave in an undamaged condition.

D. At completion of construction activities of other trades, touch up and restore damaged or defaced coated surfaces.

## 3.6 HIGH-PERFORMANCE COATING SCHEDULE

A. Steel Substrates:

1. Pigmented Polyurethane over High-Build Epoxy System:

a. Prime Coat: Primer, epoxy for metal @ 5.0 – 8.0 mils DFT:

1) Behr Paint Company; US Coatings EpoxyGrip 2000 VOC; Distributed by Behr Process Corp.
2) Benjamin Moore & Co.; COROTECH Epoxy Mastic Coating V160.
3) International Paint, LLC. (a subsidiary of AkzoNobel); Intercure 200HS.
4) PPG Paints; Amerlock 2/400.
5) Sherwin Williams Company (The); Macropoxy 646.
6) Tnemec Company, Inc.; Series 135 Chembuild

b. Topcoat: Polyurethane, two-component, pigmented, gloss (Gloss Level 6) @ 2.0 – 3.0 mils DFT:

1) Behr Paint Company; US Coatings UreGrip 3010 VOC; Distributed by Behr Process Corp.
2) Benjamin Moore & Co.; Corotech Acrylic Urethane V500.
3) International Paint, LLC. (a subsidiary of AkzoNobel); Interthane 990HS.
4) PPG Paints; Pitt-thane Ultra.

5) Sherwin Williams Company (The); Acrolon Ultra.
6) Tnemec Company, Inc.; Series 1074 Endura-Shield.

END OF SECTION 099600

# SECTION 312000.13 - EARTH MOVING FOR BUILDINGS

## 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. Section Includes:

1. Excavating and backfilling for buildings and structures.
2. Drainage course for concrete slabs-on-grade.
3. Excavating and backfilling trenches for utilities and pits for buried utility structures.
4. Geofoam.

B. Related Requirements:

1. Civil drawings for earthwork required for site construction, pavements, walks, and drives.

### 1.3 DEFINITIONS

A. Backfill: Soil material or controlled low-strength material used to fill an excavation.

1. Initial Backfill: Backfill placed beside and over pipe in a trench, including haunches to support sides of pipe.
2. Final Backfill: Backfill placed over initial backfill to fill a trench.

B. Bedding Course: Aggregate layer placed over the excavated subgrade in a trench before laying pipe.

C. Borrow Soil: Satisfactory soil imported from off-site for use as fill or backfill.

D. Drainage Course: Aggregate layer supporting the slab-on-grade that also minimizes upward capillary flow of pore water.

E. Excavation: Removal of material encountered above subgrade elevations and to lines and dimensions indicated.

1. Authorized Additional Excavation: Excavation below subgrade elevations or beyond indicated lines and dimensions as directed by Architect. Authorized additional excavation and replacement material will be paid for according to Contract provisions.

2. Unauthorized Excavation: Excavation below subgrade elevations or beyond indicated lines and dimensions without direction by Architect. Unauthorized excavation, as well as remedial work directed by Architect, shall be without additional compensation.

F. Fill: Soil materials used to raise existing grades.

G. Structures: Buildings, footings, foundations, retaining walls, slabs, tanks, curbs, mechanical and electrical appurtenances, or other man-made stationary features constructed above or below the ground surface.

H. Subbase Course: Aggregate layer placed between the subgrade and base course for hot-mix asphalt pavement, or aggregate layer placed between the subgrade and a cement concrete pavement or a cement concrete or hot-mix asphalt walk.

I. Subgrade: Uppermost surface of an excavation or the top surface of a fill or backfill immediately below subbase, drainage fill, drainage course, or topsoil materials.

J. Utilities: On-site underground pipes, conduits, ducts, and cables as well as underground services within buildings.

## 1.4 ACTION SUBMITTALS

A. Product Data: For each type of the following manufactured products required:

1. Warning tapes.
2. Geofoam.

## 1.5 QUALITY ASSURANCE

A. Geotechnical Testing Agency Qualifications: Qualified according to ASTM E 329 and ASTM D 3740 for testing indicated.

## 1.6 FIELD CONDITIONS

A. Traffic: Minimize interference with adjoining roads, streets, walks, and other adjacent occupied or used facilities during earth-moving operations.

1. Do not close or obstruct streets, walks, or other adjacent occupied or used facilities without permission from Owner and authorities having jurisdiction.
2. Provide alternate routes around closed or obstructed traffic ways if required by Owner or authorities having jurisdiction.

B. Improvements on Adjoining Property: Authority for performing earth moving indicated on property adjoining Owner's property will be obtained by Owner before award of Contract.

1. Do not proceed with work on adjoining property until directed by Architect.

C. Utility Locator Service: Notify J.U.L.I.E. before beginning earth-moving operations.

D. Do not commence earth-moving operations until temporary site fencing and erosion- and sedimentation-control measures specified in Section 015000 "Temporary Facilities and Controls" are in place.

E. The following practices are prohibited within protection zones:

1. Storage of construction materials, debris, or excavated material.
2. Parking vehicles or equipment.
3. Foot traffic.
4. Erection of sheds or structures.
5. Impoundment of water.
6. Excavation or other digging unless otherwise indicated.
7. Attachment of signs to or wrapping materials around trees or plants unless otherwise indicated.

F. Do not direct vehicle or equipment exhaust towards protection zones.

G. Prohibit heat sources, flames, ignition sources, and smoking within or near protection zones.

## PART 2 - PRODUCTS

### 2.1 SOIL MATERIALS

A. General: Provide borrow soil materials when sufficient satisfactory soil materials are not available from excavations.

B. Satisfactory Soils: Soil Classification Groups A-1, A-2-4, A-2-5, and A-3 according to AASHTO M 145, or a combination of these groups; free of rock or gravel larger than 3 inches in any dimension, debris, waste, frozen materials, vegetation, and other deleterious matter.

C. Unsatisfactory Soils: Soil Classification Groups A-2-6, A-2-7, A-4, A-5, A-6, and A-7 according to AASHTO M 145, or a combination of these groups.

1. Unsatisfactory soils also include satisfactory soils not maintained within 2 percent of optimum moisture content at time of compaction.

D. Subbase Material: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; ASTM D 2940/D 2940M; with at least 90 percent passing a 1-1/2-inch sieve and not more than 12 percent passing a No. 200 sieve.

E. Base Course: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; ASTM D 294/D 2940M 0; with at least 95 percent passing a 1-1/2-inch sieve and not more than 8 percent passing a No. 200 sieve.

F. Engineered Fill: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; ASTM D 2940/D 2940M; with at least 90 percent passing a 1-1/2-inch sieve and not more than 12 percent passing a No. 200 sieve.

G. Bedding Course: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; ASTM D 2940/D 2940M; except with 100 percent passing a 1-inch sieve and not more than 8 percent passing a No. 200 sieve.

H. Drainage Course: Narrowly graded mixture of washed crushed stone, or crushed or uncrushed gravel; ASTM D 448; coarse-aggregate grading Size 57; with 100 percent passing a 1-1/2-inch sieve and zero to 5 percent passing a No. 8 sieve.

I. Filter Material: Narrowly graded mixture of natural or crushed gravel, or crushed stone and natural sand; ASTM D 448; coarse-aggregate grading Size 67; with 100 percent passing a 1-inch sieve and zero to 5 percent passing a No. 4 sieve.

J. Sand: ASTM C 33/C 33M; fine aggregate.

K. Impervious Fill: Clayey gravel and sand mixture capable of compacting to a dense state.

## 2.2 ACCESSORIES

A. Detectable Warning Tape: Acid- and alkali-resistant, polyethylene film warning tape manufactured for marking and identifying underground utilities, a minimum of 6 inches wide and 4 mils thick, continuously inscribed with a description of the utility, with metallic core encased in a protective jacket for corrosion protection, detectable by metal detector when tape is buried up to 30 inches deep; colored as follows:

1. Red: Electric.
2. Yellow: Gas, oil, steam, and dangerous materials.
3. Orange: Telephone and other communications.
4. Blue: Water systems.
5. Green: Sewer systems.

## 2.3 GEOFOAM

A. Rigid Cellular Polystyrene Geofoam: ASTM D6817, Type EPS 19, 1.15-lb/cu. ft. density, 5.8-psi compressive strength at 1 percent deformation; 16-psi compressive strength at 10 percent deformation.

B. Connectors: Geofoam manufacturer's multibarbed, galvanized-steel sheet connectors.

PART 3 - EXECUTION

3.1 PREPARATION

A. Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout, and other hazards created by earth-moving operations.

B. Protect and maintain erosion and sedimentation controls during earth-moving operations.

C. Protect subgrades and foundation soils from freezing temperatures and frost. Remove temporary protection before placing subsequent materials.

3.2 DEWATERING

A. Prevent surface water and ground water from entering excavations, from ponding on prepared subgrades, and from flooding Project site and surrounding area.

B. Protect subgrades from softening, undermining, washout, and damage by rain or water accumulation.

1. Reroute surface water runoff away from excavated areas. Do not allow water to accumulate in excavations. Do not use excavated trenches as temporary drainage ditches.

3.3 EXCAVATION, GENERAL

A. Unclassified Excavation: Excavate to subgrade elevations regardless of the character of surface and subsurface conditions encountered. Unclassified excavated materials may include rock, soil materials, and obstructions. No changes in the Contract Sum or the Contract Time will be authorized for rock excavation or removal of obstructions.

1. If excavated materials intended for fill and backfill include unsatisfactory soil materials and rock, replace with satisfactory soil materials.

3.4 EXCAVATION FOR STRUCTURES

A. Excavate to indicated elevations and dimensions within a tolerance of plus or minus 1 inch. If applicable, extend excavations a sufficient distance from structures for placing and removing concrete formwork, for installing services and other construction, and for inspections.

1. Excavations for Footings and Foundations: Do not disturb bottom of excavation. Excavate by hand to final grade just before placing concrete reinforcement. Trim bottoms to required lines and grades to leave solid base to receive other work.

B. Excavations at Edges of Tree- and Plant-Protection Zones:

1. Excavate by hand or with an air spade to indicated lines, cross sections, elevations, and subgrades. If excavating by hand, use narrow-tine spading forks to comb soil and expose roots. Do not break, tear, or chop exposed roots. Do not use mechanical equipment that rips, tears, or pulls roots.
2. Cut and protect roots according to requirements in Section 015639 "Temporary Tree and Plant Protection."

## 3.5 EXCAVATION FOR UTILITY TRENCHES

A. Excavate trenches to indicated gradients, lines, depths, and elevations.

1. Beyond building perimeter, excavate trenches to allow installation of top of pipe below frost line.

B. Excavate trenches to uniform widths to provide the following clearance on each side of pipe or conduit. Excavate trench walls vertically from trench bottom to 12 inches higher than top of pipe or conduit unless otherwise indicated.

1. Clearance: 12 inches each side of pipe or conduit.

C. Trench Bottoms: Excavate trenches 4 inches deeper than bottom of pipe and conduit elevations to allow for bedding course. Hand-excavate deeper for bells of pipe.

1. Excavate trenches 6 inches deeper than elevation required in rock or other unyielding bearing material to allow for bedding course.

D. Trenches in Tree- and Plant-Protection Zones:

1. Hand-excavate to indicated lines, cross sections, elevations, and subgrades. Use narrow-tine spading forks to comb soil and expose roots. Do not break, tear, or chop exposed roots. Do not use mechanical equipment that rips, tears, or pulls roots.
2. Do not cut main lateral roots or taproots; cut only smaller roots that interfere with installation of utilities.

## 3.6 SUBGRADE INSPECTION

A. Notify Architect when excavations have reached required subgrade.

B. If Architect determines that unsatisfactory soil is present, continue excavation and replace with compacted backfill or fill material as directed.

C. Proof-roll subgrade below the building slabs and pavements with a pneumatic-tired and loaded 10-wheel, tandem-axle dump truck weighing not less than 15 tons to identify soft pockets and areas of excess yielding. Do not proof-roll wet or saturated subgrades.

1. Completely proof-roll subgrade in one direction, repeating proof-rolling in direction perpendicular to first direction. Limit vehicle speed to 3 mph.

2. Excavate soft spots, unsatisfactory soils, and areas of excessive pumping or rutting, as determined by Architect, and replace with compacted backfill or fill as directed.

D. Authorized additional excavation and replacement material will be paid for according to Contract provisions.

E. Reconstruct subgrades damaged by freezing temperatures, frost, rain, accumulated water, or construction activities, as directed by Architect, without additional compensation.

## 3.7 UNAUTHORIZED EXCAVATION

A. Fill unauthorized excavation under foundations or wall footings by extending bottom elevation of concrete foundation or footing to excavation bottom, without altering top elevation. Lean concrete fill, with 28-day compressive strength of 2500 psi, may be used when approved by Architect.

1. Fill unauthorized excavations under other construction, pipe, or conduit as directed by Architect.

## 3.8 STORAGE OF SOIL MATERIALS

A. Stockpile borrow soil materials and excavated satisfactory soil materials without intermixing. Place, grade, and shape stockpiles to drain surface water. Cover to prevent windblown dust.

1. Stockpile soil materials away from edge of excavations. Do not store within drip line of remaining trees.

## 3.9 BACKFILL

A. Place and compact backfill in excavations promptly, but not before completing the following:

1. Construction below finish grade including, where applicable, subdrainage, dampproofing, waterproofing, and perimeter insulation.
2. Surveying locations of underground utilities for Record Documents.
3. Testing and inspecting underground utilities.
4. Removing concrete formwork.
5. Removing trash and debris.
6. Removing temporary shoring, bracing, and sheeting.
7. Installing permanent or temporary horizontal bracing on horizontally supported walls.

B. Place backfill on subgrades free of mud, frost, snow, or ice.

## 3.10 UTILITY TRENCH BACKFILL

A. Place backfill on subgrades free of mud, frost, snow, or ice.

B. Place and compact bedding course on trench bottoms and where indicated. Shape bedding course to provide continuous support for bells, joints, and barrels of pipes and for joints, fittings, and bodies of conduits.

C. Trenches under Footings: Backfill trenches excavated under footings and within bottom of footings with satisfactory soil; fill with concrete to elevation of bottom of footings. Concrete is specified in Section 033000 "Cast-in-Place Concrete."

D. Initial Backfill:

1. Soil Backfill: Place and compact initial backfill of subbase material, free of particles larger than 1 inch in any dimension, to a height of 12 inches over the pipe or conduit.

    a. Carefully compact initial backfill under pipe haunches and compact evenly up on both sides and along the full length of piping or conduit to avoid damage or displacement of piping or conduit. Coordinate backfilling with utilities testing.

E. Final Backfill:

1. Soil Backfill: Place and compact final backfill of satisfactory soil to final subgrade elevation.

F. Warning Tape: Install warning tape directly above utilities, 12 inches below finished grade, except 6 inches below subgrade under pavements and slabs.

## 3.11 SOIL FILL

A. Plow, scarify, bench, or break up sloped surfaces steeper than 1 vertical to 4 horizontal so fill material will bond with existing material.

B. Place and compact fill material in layers to required elevations as follows:

1. Under grass and planted areas, use satisfactory soil material.
2. Under walks and pavements, use satisfactory soil material.
3. Under building slabs, use engineered fill.
4. Under footings and foundations, use engineered fill.

C. Place soil fill on subgrades free of mud, frost, snow, or ice.

## 3.12 SOIL MOISTURE CONTROL

A. Uniformly moisten or aerate subgrade and each subsequent fill or backfill soil layer before compaction to within 2 percent of optimum moisture content.

1. Do not place backfill or fill soil material on surfaces that are muddy, frozen, or contain frost or ice.
2. Remove and replace, or scarify and air dry, otherwise satisfactory soil material that exceeds optimum moisture content by 2 percent and is too wet to compact to specified dry unit weight.

## 3.13 COMPACTION OF SOIL BACKFILLS AND FILLS

A. Place backfill and fill soil materials in layers not more than 8 inches in loose depth for material compacted by heavy compaction equipment and not more than 4 inches in loose depth for material compacted by hand-operated tampers.

B. Place backfill and fill soil materials evenly on all sides of structures to required elevations and uniformly along the full length of each structure.

C. Compact soil materials to not less than the following percentages of maximum dry unit weight according to ASTM D 698:

1. Under structures, building slabs, steps, and pavements, scarify and recompact top 12 inches of existing subgrade and each layer of backfill or fill soil material at 95 percent.
2. Under walkways, scarify and recompact top 6 inches below subgrade and compact each layer of backfill or fill soil material at 92 percent.
3. Under turf or unpaved areas, scarify and recompact top 6 inches below subgrade and compact each layer of backfill or fill soil material at 85 percent.
4. For utility trenches, compact each layer of initial and final backfill soil material at 85 percent.

## 3.14 GRADING

A. General: Uniformly grade areas to a smooth surface, free of irregular surface changes. Comply with compaction requirements and grade to cross sections, lines, and elevations indicated.

1. Provide a smooth transition between adjacent existing grades and new grades.
2. Cut out soft spots, fill low spots, and trim high spots to comply with required surface tolerances.

B. Site Rough Grading: Slope grades to direct water away from buildings and to prevent ponding. Finish subgrades to elevations required to achieve indicated finish elevations, within the following subgrade tolerances:

1. Turf or Unpaved Areas: Plus or minus 1 inch.
2. Walks: Plus or minus 1 inch.
3. Pavements: Plus or minus 1/2 inch.

C. Grading inside Building Lines: Finish subgrade to a tolerance of 1/2 inch when tested with a 10-foot straightedge.

3.15 FIELD QUALITY CONTROL

A. Testing Agency: Owner will engage a qualified geotechnical engineering testing agency to perform tests and inspections.

B. Allow testing agency to inspect and test subgrades and each fill or backfill layer. Proceed with subsequent earth moving only after test results for previously completed work comply with requirements.

C. Footing Subgrade: At footing subgrades, at least one test of each soil stratum will be performed to verify design bearing capacities. Subsequent verification and approval of other footing subgrades may be based on a visual comparison of subgrade with tested subgrade when approved by Architect.

D. Testing agency will test compaction of soils in place according to ASTM D 1556, ASTM D 2167, ASTM D 2937, and ASTM D 6938, as applicable. Tests will be performed at the following locations and frequencies:

1. Paved and Building Slab Areas: At subgrade and at each compacted fill and backfill layer, at least one test for every 2000 sq. ft. or less of paved area or building slab but in no case fewer than three tests.
2. Foundation Wall Backfill: At each compacted backfill layer, at least one test for every 100 feet or less of wall length but no fewer than two tests.
3. Trench Backfill: At each compacted initial and final backfill layer, at least one test for every 150 feet or less of trench length but no fewer than two tests.

E. When testing agency reports that subgrades, fills, or backfills have not achieved degree of compaction specified, scarify and moisten or aerate, or remove and replace soil materials to depth required; recompact and retest until specified compaction is obtained.

3.16 PROTECTION

A. Protecting Graded Areas: Protect newly graded areas from traffic, freezing, and erosion. Keep free of trash and debris.

B. Repair and reestablish grades to specified tolerances where completed or partially completed surfaces become eroded, rutted, settled, or where they lose compaction due to subsequent construction operations or weather conditions.

1. Scarify or remove and replace soil material to depth as directed by Architect; reshape and recompact.

C. Where settling occurs before Project correction period elapses, remove finished surfacing, backfill with additional soil material, compact, and reconstruct surfacing.

1. Restore appearance, quality, and condition of finished surfacing to match adjacent work, and eliminate evidence of restoration to greatest extent possible.

3.17 DISPOSAL OF SURPLUS AND WASTE MATERIALS

A. Remove surplus satisfactory soil and waste materials, including unsatisfactory soil, trash, and debris, and legally dispose of them off Owner's property.

END OF SECTION 312000.13