



CITY of POOLER
— GEORGIA —

SPECIFICATIONS
Pooler Basketball Courts

I. INTRODUCTION

The City of Pooler, a municipality within the State of Georgia, is requesting proposals for Pooler Basketball Courts. This Request for Proposal (RFP) outlines the requirements and instructions for submitting a proposal for the project, the evaluation process, and the terms and conditions of the potential contract.

II. PURPOSE

The purpose of this RFP is to solicit competitive proposals from qualified contractors/vendors to construct two adjoining basketball courts with a surrounding fence. The Municipality is committed to ensuring that the project is completed in compliance with all applicable laws, within the established budget, and within the specified time frame.

III. SCOPE OF WORK

The scope of work for this project includes, but is not limited to, the following:

Task 1: The contractor shall perform all necessary site preparation, including grading and sub-base work, followed by the installation of the complete court surface system. In addition, the contractor shall furnish and install a perimeter fence enclosing the court area, complete with posts, gates, and all required hardware to ensure proper enclosure and functionality. The selected vendor will be responsible for delivering the project in full compliance with municipal and state regulations, including those specific to the State of Georgia, local zoning, permitting, and environmental laws.

IV. ELIGIBILITY CRITERIA

- Must be a legally registered entity in the State of Georgia with a valid business license.
- Demonstrated experience in relevant field or service.
- Ability to provide proof of required insurance and bonding (as applicable).
- Must comply with Georgia's Open Records Act (O.C.G.A. § 50-18-70 et seq.), which governs the transparency of public contracts and submissions.
- Proof of previous experience on projects of a similar size and scope, ideally within Georgia or local government entities.
- Include other specific eligibility requirements relevant to the project.

V. PROPOSAL SUBMISSION INSTRUCTIONS

Proposals must be submitted by **December 2, 2025, at 2pm**. Late submissions will not be considered. Proposals should be submitted in one of the following formats:

- Georgia Procurement Registry
- Email submission to: Kfusco@pooler-ga.gov
- Mail submission to: 100 US Highway 80 SW, Pooler, GA 31322
- Deliver in person to: City Clerk, Kiley Fusco

Proposals should include the following documents:

- Cover Letter: A letter introducing the company, key personnel, and expressing interest in the project.
- Company Profile: An overview of the company, including size, background, and qualifications.
- Detailed Proposal: Including methodology, timeline, costs, and relevant past project examples.
- References: At least three (3) client references with relevant project experience.
- Proof of Insurance and Bonding (if applicable): Include certificates of insurance and bonds required by the State of Georgia and the Municipality.
- Georgian Business License: Proof of business registration within Georgia.

VI. PROPOSAL EVALUATION CRITERIA

Proposals will be evaluated based on the following criteria:

- Experience and Qualifications (30%): Relevant experience in similar projects, expertise of proposed team members, and successful past projects.
- Technical Approach (25%): The proposed solution, methodology, and approach to meeting the Municipality's needs.
- Cost (20%): The total cost, including breakdowns, justifications, and any value-added services.
- Timeline (15%): The ability to complete the project within the required timeframe.
- References and Past Performance (10%): Client feedback and past performance on projects of similar scope.

The Municipality reserves the right to request clarifications, additional information, and to conduct interviews or presentations if necessary.

VII. CONTRACT TERMS AND CONDITIONS

The successful proposer will be required to enter into a formal agreement with the Municipality. Key terms of the contract may include, but are not limited to:

- Payment Terms: pay approvals submitted to engineer, engineer submits pay requests to the city.
- Termination Clause: The Owner may terminate this Contract at any time, without cause, by providing written notice to the Contractor. The Contractor shall be compensated for Work performed up to the date of termination.
- Compliance with Laws: The contractor must comply with all relevant municipal, state, and federal laws, including the Georgia Procurement Manual.

- Insurance and Bonding: The contractor must provide adequate insurance and bonding as required by the State of Georgia and the Municipality.
- Open Records Act: The Municipality is bound by Georgia's Open Records Act, and all submissions are subject to public inspection unless otherwise protected under the law.
- Indemnification: The contractor must indemnify and hold harmless the Municipality from claims, damages, and liabilities arising from the performance of the contract.

VIII. PROPOSAL TIMELINE

RFP Release Date: October 28, 2025

Pre-Proposal Meeting: November 12, 2025, 2pm

Deadline for Submission of Questions: November 21, 2025, 5 pm

Proposal Submission Deadline: December 2, 2025, 2pm

Proposal Evaluation Period: December 3-9, 2025

Award Announcement: December 15, 2025

Contract Start Date: 90 day contract to start when contract is signed and pre-construction meeting completed

Project Completion Date: 90 days after pre-construction meeting

IX. QUESTIONS AND CLARIFICATIONS

All inquiries regarding this RFP should be submitted in writing to the RFP contact person by the specified deadline. The Municipality will provide written responses to all questions and distribute them to all interested vendors.

Deadline for Questions: November 21, 2025

RFP Contact Name: Suzanne Audette

Email Address: saudette@jqolusa.com

Phone Number: (541)647-0874

X. CONTACT INFORMATION

For additional information or clarification regarding this RFP, please contact:

RFP Coordinator: Matt Saxson

Title: Asst. City Manager

Email: msaxson@pooler-ga.gov

Phone: (912) 748-7261

Mailing Address: 100 US Highway 80 SW, Pooler, GA 31322

XI. APPENDICES

Appendix A: Drawings and specifications.

I. Drawings: JQOL Pooler Basketball Courts Set

1. C-0.0 - Cover Sheet
2. C-0.1 - General Notes
3. C-0.2 - Existing Conditions Plan
4. C-0.3 - Erosion Control Plan
5. C-0.4 - Demolition Plan
6. C-0.5 - Erosion control Details
7. C-1.0 - Site Plan
8. C-1.1 - Site Details
9. C-2.0 - Grading Plan

10.C-3.0 – Erosion Control Plan

II. Specifications

1. 030000- Cast in Place Concrete
2. 116800 – Play Field Equipment and Structures
3. 31200 – Earth Moving
4. 3150000 – Excavation and Support Protection
5. 321216 – Asphalt Paving
6. 321723 – Pavement Markings
7. 321800 Athletic Court Surfacing
8. 323113- Chain Link Fences and Gates

CONSTRUCTION PLANS FOR: POOLER BASKETBALL COURTS

900 S. ROGERS ST

POOLER, GA

CHATHAM COUNTY

GENERAL NOTES:

- THE CONSTRUCTION PLANS SHALL GOVERN OVER ANY OTHER FORM OF MEDIA, WHICH INCLUDES DIGITAL FILES OF THIS PROJECT.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING OR VERIFYING THAT ALL PERMITS AND APPROVALS ARE FOR OBTAINING FROM THE RESPECTIVE CITY, COUNTY, STATE & FEDERAL AGENCIES PRIOR TO STARTING CONSTRUCTION.
- IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO DETERMINE THE EXACT LOCATION OF ALL EXISTING UTILITIES IN THE VICINITY OF THE CONSTRUCTION AREA PRIOR TO STARTING CONSTRUCTION UNLESS OTHERWISE INDICATED IN THE CONSTRUCTION DRAWINGS.
- PRIOR TO WORKING WITH OR AROUND EXISTING UTILITIES, THE APPLICABLE UTILITY COMPANY SHALL BE CONTACTED BY THE CONTRACTOR. IT SHALL BE THE CONTRACTORS RESPONSIBILITY TO NOTIFY AND COORDINATE CONSTRUCTION WITH ALL RESPECTIVE UTILITIES.
- ALL CONSTRUCTION METHODS AND MATERIALS MUST CONFORM TO CURRENT STANDARDS AND SPECIFICATIONS FOR THE GOVERNING MUNICIPALITY REQUIREMENTS.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL FIELD DIMENSIONS AND SHALL VERIFY ALL DIMENSIONS ON THE SITE PRIOR TO THE START OF CONSTRUCTION. IF ANY DISCREPANCIES ARE FOUND IN THE PLAN FROM ACTUAL FIELD CONDITIONS, THE CONTRACTOR SHALL NOTIFY THE ENGINEER IMMEDIATELY.
- IT SHALL BE THE RESPONSIBILITY OF THE DEVELOPER AND CONTRACTOR TO MAINTAIN QUALITY CONTROL THROUGHOUT THIS PROJECT.
- ALL GRADES AT THE SITE'S BOUNDARY SHALL MEET EXISTING GRADES.
- NO WORK SHALL BE CONSTRUCTED OFFSITE UNLESS SHOWN OR DENOTED WITHIN THESE PLANS.
- NO CONSTRUCTION WORK SHALL BE PERFORMED WITHIN THE ADJACENT OR ONSITE WATER TRIBUTARIES/WATERCOURSES UNLESS SHOWN OR DENOTED AS SUCH OTHERWISE WITHIN THESE PLANS
- CONTRACTOR SHALL MINIMIZE DAMAGE TO ANY EXISTING TREES UNLESS NOTED OTHERWISE.
- ALL CONSTRUCTION ACTIVITY ON THIS SITE IS TO BE PERFORMED IN COMPLIANCE WITH ALL APPLICABLE O.S.H.A. STANDARDS FOR WORKERS' SAFETY.
- BEARING, DIMENSIONS, AND EASEMENTS ARE SHOWN FOR REFERENCE ONLY. SEE RECORD SURVEYS AND PLATS FOR EXACT INFORMATION.

SITE DATA:

TOTAL SITE ACREAGE - 126.72 AC.
TOTAL ACREAGE OF DISTURBANCE - 0.52 AC.

PROPOSED CONSTRUCTION START - XXXXXXXXXXXXXXXX
PROPOSED CONSTRUCTION END - XXXXXXXXXXXXXXXX
WORK IS SCHEDULED TO BE COMPLETED IN ONE CONTINUOUS CONSTRUCTION PHASE.

SPECIFICATIONS:

- ALL WORK SHALL BE IN ACCORDANCE WITH ALL APPLICABLE CITY OF POOLER/CHATHAM COUNTY STANDARDS, DETAILS, AND SPECIFICATIONS (LATEST EDITIONS) - UNLESS OTHERWISE NOTED.
- GEORGIA DEPARTMENT OF TRANSPORTATION (GDOT) AND GEORGIA SOIL AND WATER CONSERVATION COMMISSION (GASWCC) STANDARD DRAWINGS AND SPECIFICATIONS (LATEST EDITIONS) SHALL BE INCORPORATED INTO AND UTILIZED WITH THESE PLANS (SUPPLEMENTAL SPECIFICATIONS AND DETAILS).

PROJECT LOCATION

900 S ROGERS ST, POOLER, GA 31322

BENCHMARK DESCRIPTIONS:

NAIL SET IN 21" PINE TREE.

ELEV. 21.00 (NAVD 88)

ADDITIONAL BENCHMARKS

CONTROL POINT - 1/2" IRON REBAR. N: 768057.94, E: 939921.89

ELEV. 18.13 (NAVD 88)

CONTROL POINT - 1/2" IRON REBAR. N: 768223.93, E: 939644.89

ELEV. 18.21 (NAVD 88)

SHEET LIST TABLE

SHEET NUMBER	SHEET TITLE
C-0.0	COVER
C-0.1	GENERAL NOTES
C-0.2	EXISTING CONDITIONS PLAN
C-0.3	EROSION CONTROL PLAN - INITIAL
C-0.4	DEMOLITION PLAN
C-0.5	EROSION CONTROL DETAILS
C-1.0	SITE PLAN
C-1.1	SITE DETAILS
C-2.0	GRADING PLAN
C-3.0	EROSION CONTROL PLAN - FINAL



8440 Allison Pointe Blvd.
Indianapolis, IN 46250
www.jqolusa.com



DATE: 09/22/2025

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CONSTRUCTION DOCUMENTS

PROJECT:
POOLER BASKETBALL COURTS

900 S. ROGERS ST
POOLER, GA

PREPARED FOR:
CITY OF POOLER

100 US HIGHWAY 80 SW
POOLER, GA

#	Revision	Date
1	-	-
2	-	-
3	-	-

PROJECT NO.: 2025.143

SHEET NAME:

COVER SHEET

SHEET ISSUE DATE: 27-Oct-25

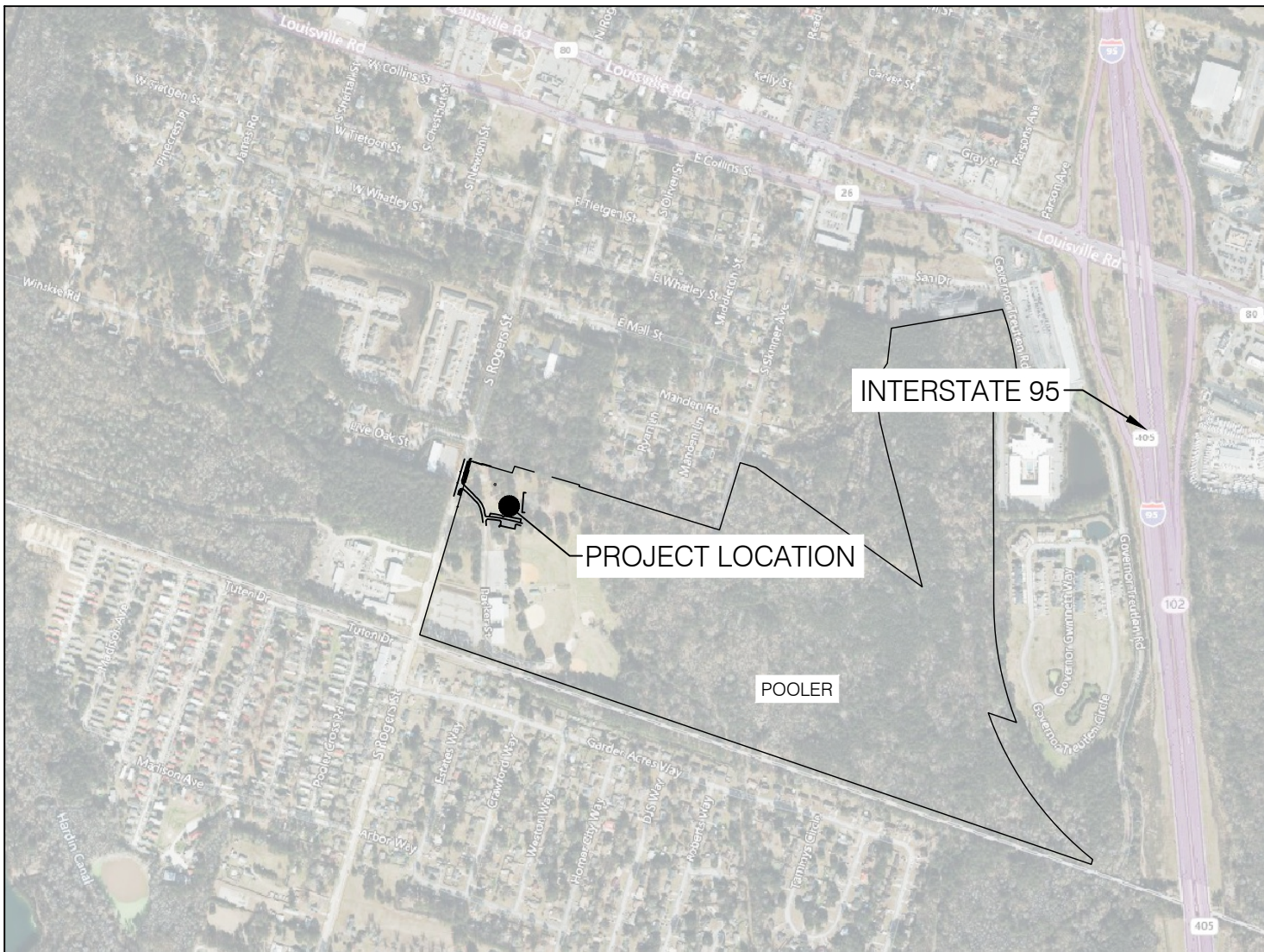
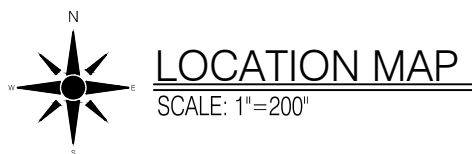
SCALE: NO SCALE

DESIGNED: SP/SDA CHECKED: RS

SHEET NO.:

C-0.0

SHEET
0 OF 9



QUANTITIES NOTE:

ANY AND ALL QUANTITY TABLES, NOTES OR VALUES AS SHOWN ON THESE PLANS ARE FOR REFERENCE ONLY. THE PLANS, DETAILS, AND SPECIFICATION GOVERN. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO REVIEW THE ENTIRE CONSTRUCTION SET AND DETERMINE ALL THE FINAL QUANTITIES FOR ALL NECESSARY ITEMS REQUIRED TO COMPLETE THIS PROJECT. THE OWNER OR THE ENGINEER WILL NOT BE HELD LIABLE OR RESPONSIBLE FOR ESTIMATES NOT CONFIRMED BY THE CONTRACTORS. THE CONTRACTOR SHALL VERIFY ALL QUANTITIES PRIOR TO BIDDING AND CONSTRUCTION. IF DISCREPANCIES ARE FOUND, CONTACT THE ENGINEER IMMEDIATELY.



Know what's below.
Call before you dig.

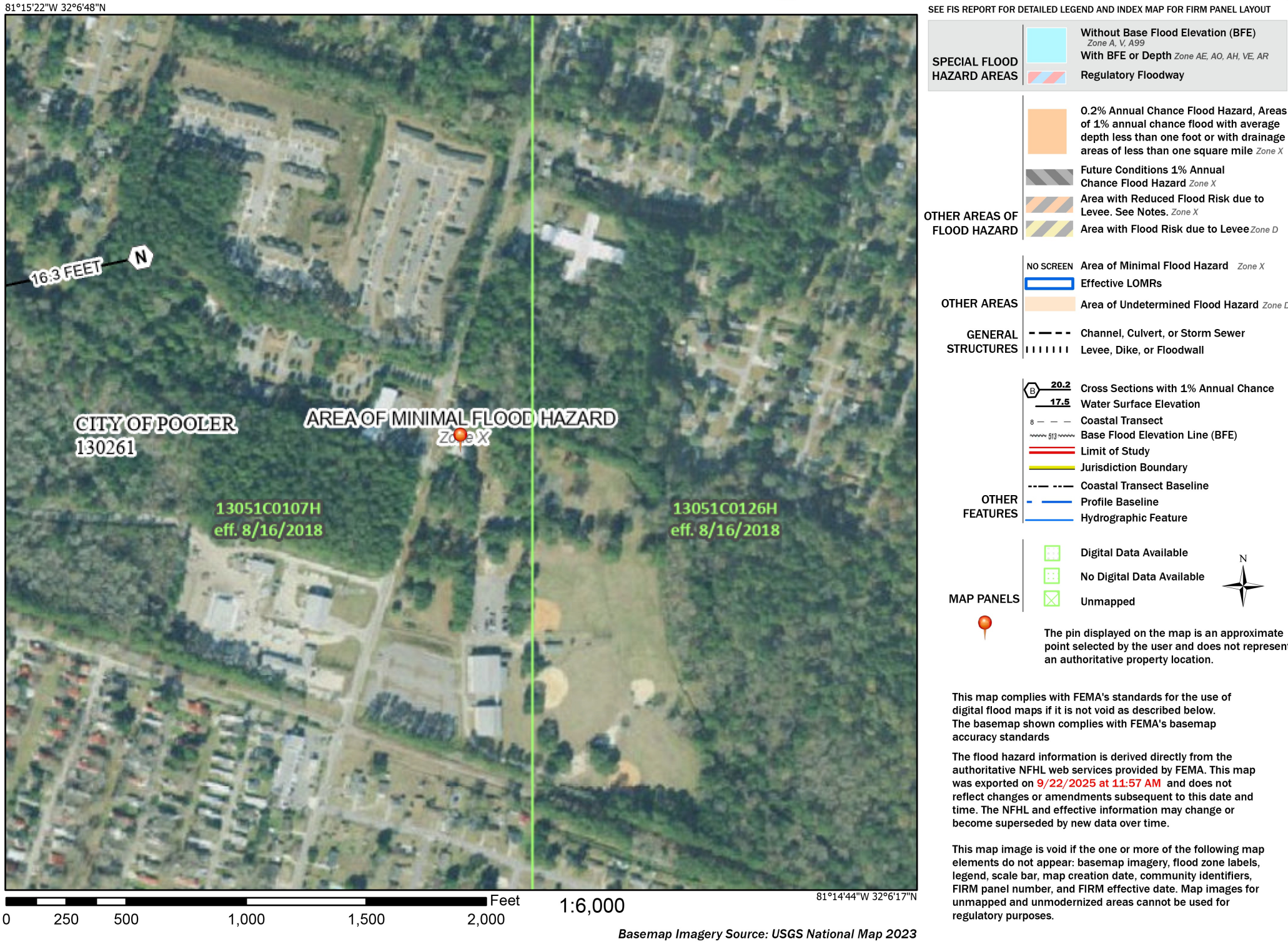
GENERAL CONSTRUCTION NOTES:

- ALL CONSTRUCTION SHALL BE IN CONFORMANCE TO THE CURRENT CITY OF POOLER DESIGN STANDARDS, SPECIFICATIONS AND DETAILS OR AS OTHERWISE ISSUED FOR THIS PROJECT. IN CASE OF CONFLICT BETWEEN THESE PLANS AND THE CITY OF POOLERS ORDINANCES, STANDARDS, SPECIFICATIONS, AND DETAILS, THE CITY OF POOLER REQUIREMENTS SHALL TAKE PRECEDENCE.
- LAYOUT TO BE CONTROLLED BY EXISTING BENCHMARK.
- DIMENSIONS TO CURB AND GUTTER ARE TO FACE OF CURB.
- DIMENSIONS TO WALK ARE TO FACE OF WALK.
- DIMENSIONS TO BUILDING ARE TO FACE OF BUILDING.
- DIMENSIONS TO STRIPING ARE TO CENTERLINE OF STRIPING.
- ALL ANGLES ARE 90" UNLESS OTHERWISE NOTED.
- ALL RADII ARE 5' UNLESS OTHERWISE NOTED.
- TRAFFIC CONTROL DEVICES SHALL BE USED ON ALL WORK ON THIS PROJECT IN ACCORDANCE WITH THE "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES FOR STREETS AND HIGHWAYS" CURRENT EDITION. THE COST TO COMPLY SHALL BE INCLUDED IN THE OVERALL COST OF THE PROJECT.
- REFERENCE SURVEYS:
 - SURVEY - PREPARED BY SHUPE SURVEYING COMPANY, P.C. (05/08/2025).
 - VERTICAL DATUM: NAVD88 - HORIZONTAL DATUM: NAD83
 - PROJECT IS ON STATE PLANE COORDINATES.
 - JQOL USA DOES NOT ACCEPT ANY RESPONSIBILITY FOR ACCURACY OF PROVIDED SURVEY INFORMATION.
 - ONLY ABOVE GROUND, READILY VISIBLE STRUCTURES, UTILITIES AND SURFACE PAINT MARKINGS WERE LOCATED FOR THIS SURVEY. THE SURVEYOR MAKES NO WARRANTY OR GUARANTEE AS TO THE LOCATION, EXISTENCE, OR NON-EXISTENCE OF ANY BELOW GROUND, NON-VISIBLE UTILITIES OR STRUCTURES. CONTRACTOR SHALL FIELD VERIFY LOCATION, TYPE, SIZE, MATERIAL AND GENERAL CONDITION OF ALL UTILITIES PRIOR TO CONSTRUCTION.
 - ALL GRADED EARTH NOT OTHERWISE STABILIZED WITH PAVEMENT OR VEGETATION SHALL BE GRASSED OR SODDED.
 - OWNER SHALL ACCEPT MAINTENANCE OF THE STORM DRAINAGE SYSTEM, INCLUDING ROOF DRAIN CONNECTIONS, WITHIN THE LIMITS OF THE PROPERTY. CITY OF POOLER WILL NOT MAINTAIN THE STORM DRAINAGE SYSTEM WITHIN THE PROPERTY. THIS SITE IS DESIGNED TO DISCHARGE STORM WATER RUNOFF INTO THE APPROVED MASTER DRAINAGE CONVEYANCE AND DETENTION SYSTEM.
 - DITCHES, ALL DRAINAGE STRUCTURES, ORIFICES AND PAVEMENT ELEVATIONS SHALL BE SURVEYED FOR 'AS-BUILT' DRAWINGS ALONG WITH THE WATER AND SANITARY SEWER SERVICES.
 - ADJUST EXISTING MANHOLE FRAMES, GRATES AND VALVE BOXES TO GRADE AS NEEDED.
 - ALL STORM DRAIN PIPE JOINTS SHALL BE WRAPPED WITH FILTER FABRIC.
 - MATCH EXISTING PAVEMENT GRADE ELEVATIONS WHERE CONNECTING TO EXISTING PAVEMENT.
 - CONTRACTOR TO FIELD VERIFY DURING CONSTRUCTION ANY EXISTENCE OF SUB-SURFACE DEBRIS OR ORGANIC MATERIAL. ANY SUB-SURFACE DEBRIS OR ORGANIC MATERIAL FOUND SHALL BE EXCAVATED TO A MINIMUM DEPTH OF 2' BELOW GRADED AGGREGATE BASE IN PAVEMENT AREAS AND 2' BELOW BOTTOM OF FOOTINGS FOR BUILDINGS (CONTRACTOR SHALL CONSULT WITH BUILDING STRUCTURAL ENGINEER FOR ANY WORK BENEATH OR ADJACENT TO BUILDING AND/OR ABOVE OR BELOW GRADE STRUCTURES). IF EXCESSIVE DEBRIS OR ORGANIC MATERIAL IS FOUND, ENGINEER SHALL BE CONTACTED FOR INSPECTION. REMOVAL OF INSPECTED MATERIAL SHALL BE DIRECTED BY THE ENGINEER.
 - ALL EROSION AND SEDIMENT CONTROL DEVICES (BMPs) SHALL BE CONSTRUCTED SIMULTANEOUSLY WITH THE DISTURBANCE OF THE LAND AND SHALL REMAIN FUNCTIONAL AND BE MAINTAINED BY CONTRACTOR UNTIL THE CONTRIBUTING DISTURBED AREA IS STABILIZED IN ACCORDANCE WITH THE GOVERNING NPDES GENERAL PERMIT.
 - IF A RIGHT-OF-WAY ENCROACHMENT PERMIT MUST BE OBTAINED AND IS THE SOLE RESPONSIBILITY OF THE CONTRACTOR TO OBTAIN SUCH PERMIT.
 - THE CITY OF POOLER INSPECTIONS DEPARTMENT RESERVES THE RIGHT TO ACCESS PROPERTY TO INSPECT STORM WATER FACILITIES AT ANY TIME.
 - CHLORINATED, DISINFECTED WATER SHALL NOT BE DISCHARGED INTO THE STORM WATER SYSTEM.
 - TRAFFIC CONTROL AND FLOW SHALL BE MAINTAINED AT ALL TIMES DURING CONSTRUCTION.
 - A MINIMUM SEPARATION OF 10 FEET SHALL BE MAINTAINED BETWEEN ALL INSTALLED OR RELOCATED UTILITIES AND LARGE AND MEDIUM TREES.
 - ANY AND ALL STREET LIGHTING, LANDSCAPE, SIDEWALK AND ACCESSIBILITY REQUIREMENTS TO BE PERFORMED, DESIGNED AND/OR CONSTRUCTED SHALL BE COORDINATED WITH CIVIL ENGINEER.
 - CONTRACTOR SHALL REFER TO ARCHITECTURAL AND/OR MECHANICAL, ELECTRICAL AND PLUMBING PLANS FOR THE ROOF DRAIN SYSTEM. COLLECTION AND DISCHARGE SHALL BE COORDINATED WITH CIVIL ENGINEER.
 - ALL CONSTRUCTION MATERIALS AND WORKMANSHIP SHALL BE IN ACCORDANCE TO THE APPROPRIATE JURISDICTIONS APPROVED CONSTRUCTION SPECIFICATIONS AND DETAILS.
 - THE OWNER, OWNERS REPRESENTATIVES, CITY OF POOLER AND OTHER REGULATORY AGENCIES SHALL HAVE THE RIGHT TO ACCESS THE SITE AT ANY TIME FOR PURPOSES OF OBSERVING WORK PERFORMED.
 - ALL UTILITIES ARE SHOWN AS APPROXIMATE ON THE PLANS AND SHOULD BE FIELD VERIFIED BY THE CONTRACTOR. SOME UTILITIES AND SERVICE LINE LOCATIONS ARE UNKNOWN AND NOT SHOWN ON THE PLANS. THIS DOES NOT RELIEVE THE CONTRACTOR FROM THE RESPONSIBILITY TO PROTECT EXISTING UNDERGROUND FACILITIES. THE CONTRACTOR IS RESPONSIBLE FOR OBTAINING A VALID UTILITY LOCATE TICKET FROM THE GEORGIA UTILITIES PROTECTION CENTER (811/ 800-282-7411), AND COORDINATION WITH OTHER SUCH LOCAL UTILITIES AS MAY BE REQUIRED.
 - THE CONTRACTOR WILL PROTECT ALL TREES NOTED TO REMAIN WITHIN AND ADJACENT TO THE CONSTRUCTION ZONE. ANY UNAUTHORIZED REMOVAL OF TREES NOTED TO REMAIN WILL BE THE RESPONSIBILITY OF THE CONTRACTOR TO REESTABLISH TO THE SATISFACTION OF THE ENGINEER.
 - THE CONTRACTOR IS RESPONSIBLE FOR FURNISHING ALL BORROW MATERIAL NECESSARY FOR THE CONSTRUCTION OF THIS PROJECT. ALL BORROW MATERIAL SHALL BE CLEAN AND FREE OF DEBRIS AND ORGANIC MATERIAL AND SUFFICIENT TO COMPACT TO A MINIMUM BEARING CAPACITY OF 2,500 PSF OR AS OTHERWISE SPECIFIED.
 - ALL ITEMS CLEARED OR DEMOLISHED FROM THE SITE, INCLUDING SPOIL MATERIAL TO BE REMOVED FOR OFF-SITE DISPOSAL, ARE THE PROPERTY OF THE CONTRACTOR UNLESS THEY ARE TO BE REUSED ON THE SITE OR OTHERWISE NOTED. NO BURYING OR BURNING OF DEBRIS WILL BE ALLOWED ON THIS SITE.
 - THE CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING BEST MANAGEMENT PRACTICES (BMP'S) ON THE SITE AT ALL TIMES IN ACCORDANCE WITH THESE PLANS AND THE "MANUAL FOR EROSION AND SEDIMENT CONTROL OF GEORGIA".

GENERAL DEVELOPMENT NOTES:

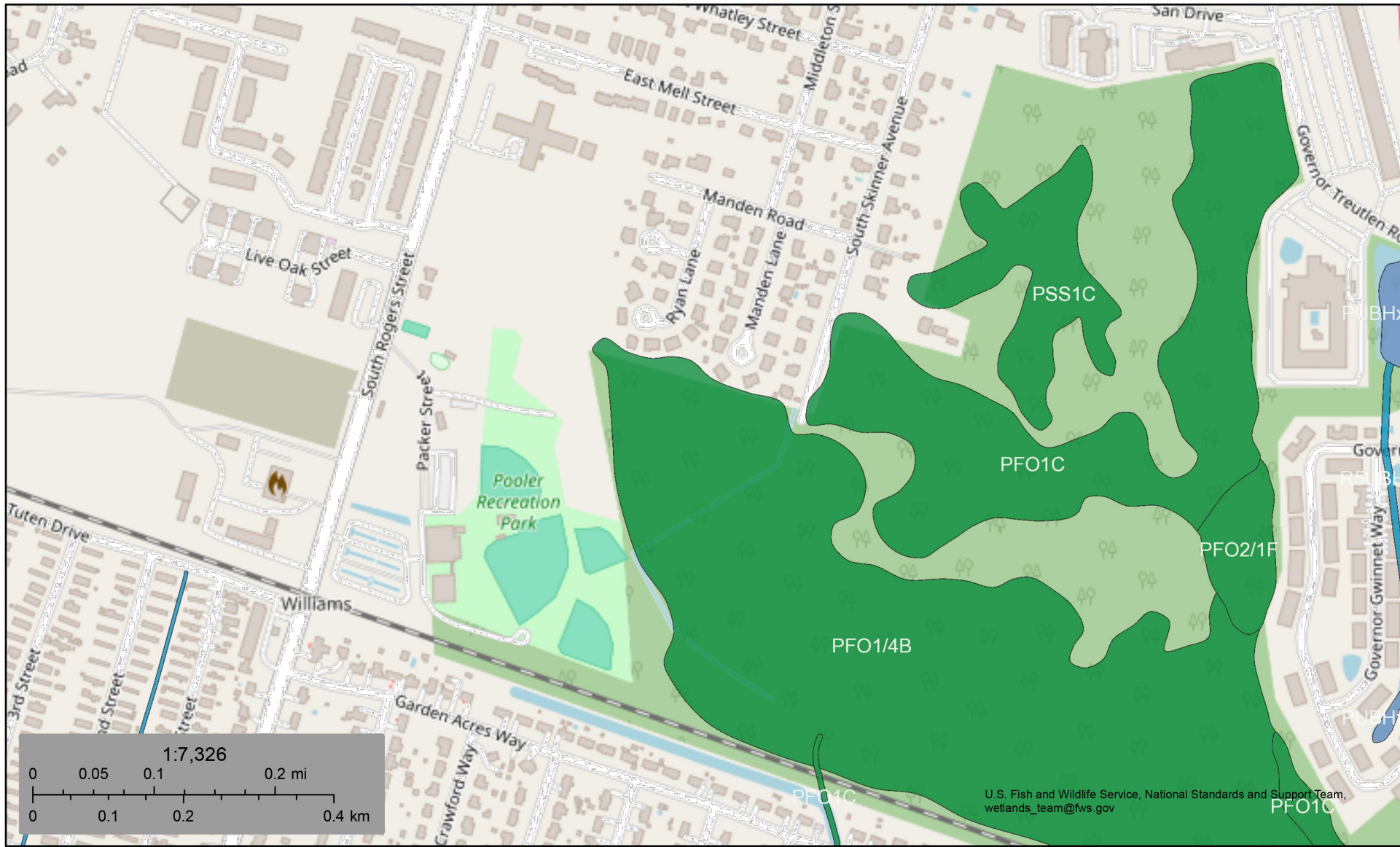
- ADDRESS:
900 S ROGERS ST
POOLER, GA 31322
- CONSTRUCTION EXIT LOCATION:
N: 32.108524°
W: 81.250647°
- TOTAL LAND ACREAGE = 126.72(±) AC
TOTAL DISTURBED ACREAGE = 0.44(±) AC
- EXISTING USE OF PROPERTY : RECREATION
PROPOSED USE OF PROPERTY : RECREATION
PRESENT SITE ZONING : R2
MAXIMUM BUILDING HEIGHT : N/A
- PROPERTY IS LOCATED IN ZONE X, NOT A SPECIAL FLOOD HAZARD AREA AS DETERMINED BY FEMA FLOOD INSURANCE RATE MAP # 13051C0107H, PANEL 107, DATED 08/16/2018
- NO STATE WATERS EXIST ON SITE
- NO WETLANDS EXIST ON SITE

National Flood Hazard Layer FIRMette



U.S. Fish and Wildlife Service
National Wetlands Inventory

POOLER RECREATION PARK



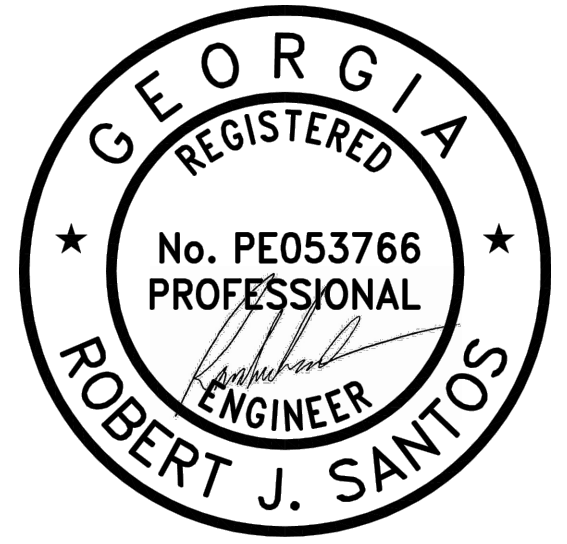
September 19, 2025

This map is for general reference only. The US Fish and Wildlife Service is not responsible for the accuracy or currentness of the base data shown on this map. All wetlands related data should be used in accordance with the layer metadata found on the Wetlands Mapper web site.

National Wetlands Inventory (NWI)
This page was produced by the NWI mapper



8440 Allison Pointe Blvd.
Indianapolis, IN 46250
www.jqolusa.com



DATE: 09/22/2025

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CONSTRUCTION DOCUMENTS

PROJECT: POOLER BASKETBALL COURTS

900 S. ROGERS ST
POOLER, GA

PREPARED FOR:

CITY OF POOLER

100 US HIGHWAY 80 SW
POOLER, GA

#	Revision	Date
1	-	-
2	-	-
3	-	-

PROJECT NO.: 2025.143

SHEET NAME:

GENERAL NOTES

SHEET ISSUE DATE: 27-Oct-25

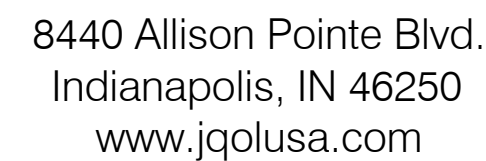
SCALE: NO SCALE

DESIGNED: SP/SDA CHECKED: RS

SHEET NO.:

C-0.1

SHEET
1 OF 9



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CITY OF POOLER

PROJECT NO.: 2025.143

SHEET ISSUE DATE:	27-Oct-25
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SCALE: 1" = 20'

DESIGNED:	SP/SDA	CHECKED:	RS
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SHEET NO.:

C-0.2

SHEET
2 OF 9



- | | | | |
|---|---|---|------------------------|
|  | IRF |  | IRON REBAR FOUND |
| | |  | POST |
| | |  | UTILITY POLE |
| | |  | STORM DRAIN MANHOLE |
| | |  | SIGN |
| | |  | WATER VALVE |
| | |  | WATER VALVE MARKER |
| | x 17.6 | | SPOT ELEVATION |
| | x _____ | | FENCE |
| | OHU _____ | | OVERHEAD UTILITY LINES |
| | ===== | | STORM DRAIN PIPE |
| | ----- | | TOP OF BANK |
| | | | BOTTOM OF BANK |
| |  | | ASPHALT |
| |  | | CONCRETE |
| |  | | GRAVEL |

NOTES:

1. BOUNDARY INFORMATION SHOWN ON THIS SURVEY WAS TAKEN FROM DIGITAL FILES PROVIDED BY CLIENT. THIS SURVEY IS NOT A BOUNDARY SURVEY AND IS NOT TO BE RECORDED OR USED FOR REAL PROPERTY TRANSFER.
2. FIELD EQUIPMENT USED FOR THIS SURVEY: LEICA TS 12 CARLSON BRX7 RTK GPS WITH VRS NETWORK (eGPS SOLUTIONS)
3. THE VERTICAL DATUM IS BASED ON NAVD88 AND WAS ESTABLISHED UTILIZING RTK GPS WITH A VRS NETWORK(eGPS SOLUTIONS)
4. THE ADJOINING PROPERTY INFORMATION SHOWN ON THIS SURVEY WAS TAKEN FROM THE CHATHAM COUNTY GIS WEBSITE ([HTTPS://WWW.SAGIS.ORG/](https://www.sagis.org/)) AND COURTHOUSE RESEARCH.
5. THIS SURVEY AND ALL SUBSEQUENT REVISIONS ARE BASED SOLELY ON FIELD WORK THAT WAS COMPLETED ON 05/29/2025 (UNLESS OTHERWISE NOTED). SHUPE SURVEYING COMPANY, P.C. IS NOT RESPONSIBLE FOR ANY CHANGES TO SITE CONDITIONS AFTER THIS DATE.
6. ACCORDING TO F.I.R.M. MAP NO. 13051C0107H, PANEL 107, EFFECTIVE DATE 08/16/2018, IT IS MY OPINION THAT THE PROPERTY SHOWN ON THIS PLAT LIES WITHIN ZONE ZONE X (UNSHADED), WHICH IS NOT A SPECIAL FLOOD HAZARD AREA.

ZONE X (UNSHADED) – AREAS OF MINIMAL FLOOD HAZARD.
7. FRESHWATER WETLANDS MAY BE UNDER THE JURISDICTION OF THE CORPS OF ENGINEERS. LOT OWNERS AND THE DEVELOPER MAY BE SUBJECT TO PENALTY BY LAW FOR DISTURBANCE TO THESE PROTECTED AREAS WITHOUT PROPER PERMIT APPLICATIONS AND APPROVAL. FRESHWATER WETLANDS WERE NOT SURVEYED AS PART OF THIS PROJECT.
8. THE TERM "CERTIFICATION" AS USED IN BOARD RULE 180-6-.09(2) AND (3) AND RELATING TO PROFESSIONAL SURVEYING SERVICES AS DEFINED IN O.C.G.A. 43-15-2(6) AND (11) SHALL MEAN A SIGNED STATEMENT BASED UPON FACTS AND KNOWLEDGE KNOWN TO THE REGISTRANT AND IS NOT A GUARANTEE OR WARRANTY, EITHER EXPRESSED OR IMPLIED.
9. THE LOCATION OF THE UTILITIES SHOWN HEREON ARE BASED ON ABOVE GROUND, READILY VISIBLE STRUCTURES (MANHOLES, VALVES, POLES, ETC.). THE SURVEYOR MAKES NO GUARANTEES THAT THE UTILITIES SHOWN HEREON COMPREHEND ALL UTILITIES IN THE AREA, EITHER IN-SERVICE OR ABANDONED. UTILITIES NOT OBSERVED OR LOCATED MAY EXIST ON THIS SITE BUT NOT BE SHOWN, AND MAY BE FOUND UPON EXCAVATION.

ZONE X (UNSHADED) - AREAS OF MINIMAL FLOOD HAZARD.



EROSION CONTROL PLAN KEYNOTES

- (Sd1) SILT FENCE
- (Tr) TREE PROTECTION FENCE
- (Co) CONSTRUCTION EXIT
- (CSA) CONSTRUCTION STAGING AREA
- (Cr) CONSTRUCTION ROAD STABILIZATION
- (CWA) CONCRETE WASHOUT
- (LOD) LIMITS OF DISTURBANCE
- (Ds1) DISTURBED AREA STABILIZATION (WITH MULCHING ONLY)
- (Ds2) DISTURBED AREA STABILIZATION (WITH TEMP SEEDING)

AREA OF DISTURBANCE: 0.52 AC.

CITY OF POOLER NOTES:

1. ALL PROPOSED EROSION AND SEDIMENT CONTROL SHALL BE IN CONFORMANCE WITH CHAPTER 24 OF CHATHAM COUNTY DEVELOPMENT ORDINANCE AND GASWCC MANUAL FOR EROSION AND SEDIMENT CONTROL IN GEORGIA (LATEST EDITION). THE CONTRACTOR IS RESPONSIBLE FOR COMPLYING WITH THE REQUIREMENTS SET FORTH WITHIN THE MANUAL AND ALL OTHER APPLICABLE LAWS.

SWPPP CONTACT:

NAME: TBD
ADDRESS: TBD
TELEPHONE: TBD
EMAIL: TBD

CONSTRUCTION SEQUENCE:

PRE-CONSTRUCTION ACTIVITIES:

1. CALL 811 SERVICE TO VERIFY THE LOCATION OF ANY EXISTING UTILITIES. 811 SHOULD BE NOTIFIED 2 WORKING DAYS BEFORE CONSTRUCTION BEGINS.
2. SILT FENCE IS TO BE INSTALLED ALONG ANY AREAS WHERE STORM RUNOFF MAY POTENTIALLY EXIT THE PROJECT SITE BASED ON THE EXISTING TOPOGRAPHY SHOWN ON THIS SHEET. THE SILT FENCE IS TO BE INSPECTED AND ANY ACCUMULATING SEDIMENT REMOVED.
3. EXISTING PAVEMENT SHALL BE UTILIZED AS A CONSTRUCTION ENTRANCE UNLESS OTHERWISE SHOWN ON THIS SHEET.
4. A CONSTRUCTION STAGING AREA FOR EQUIPMENT AND VEHICLES SHALL BE PLACED AS SHOWN ON THIS SHEET.
5. ONSITE LOCATION IS TO BE ESTABLISHED FOR CONTRACTOR PLACEMENT OF APPROVED PLANS AND INSPECTION DOCUMENTS.

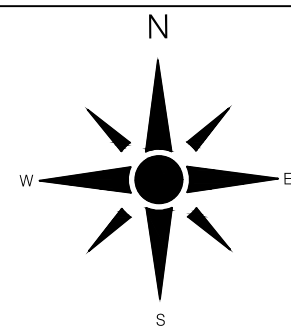
CONSTRUCTION ACTIVITIES:

1. ONCE EROSION AND SEDIMENT CONTROL MEASURES HAVE BEEN IMPLEMENTED, BEGIN LAND CLEARING FOLLOWED IMMEDIATELY BY ROUGH GRADING. LARGE AREAS ARE NOT TO BE LEFT UNPROTECTED FOR MORE THAN 14 DAYS. ANY LARGE AREAS THAT MAY BE INACTIVE FOR MORE THAN 14 DAYS ARE TO BE STABILIZED.
2. UPON COMPLETION OF ROUGH GRADING, FINAL GRADE; SEED LANDSCAPE BERMS AND SWALES IMMEDIATELY AFTER GRADING IS COMPLETED.
3. CONTRACTOR IS RESPONSIBLE FOR MAINTAINING EROSION CONTROL MEASURES AND DEVICES DURING THE CONSTRUCTION PHASE AND UNTIL SILTING OF STREETS AND STORM NETWORK WILL NO LONGER OCCUR.
4. ONCE ALL DISTURBED AREAS HAVE BEEN STABILIZED, REMOVE ACCUMULATED SEDIMENT FROM INSTALLED EROSION CONTROL DEVICES.
5. UPON ACHIEVING 70% OF VEGETATIVE COVER, THE CONTRACTOR SHALL REMOVE ALL TEMPORARY EROSION AND SEDIMENT CONTROL COMPONENTS.

MULCHING & STRAWING RATES		
MATERIAL	RATE	DEPTH
STRAW OR HAY	-	2" TO 4"
WOOD CHIPS, SAWDUST, BARK	-	2" TO 3"

Ds1 NOTES:

1. APPLY DRY STRAW, HAY, OR MULCH UNIFORMLY BY HAND OR BY MECHANICAL EQUIPMENT.
2. PRESS THE STRAW/HAY INTO THE SOIL IMMEDIATELY AFTER APPLICATION.
3. ANCHOR WOOD USING APPROPRIATE SIZED NETTING.



GRAPHIC SCALE

0' 20' 40' 60'

(IN FEET)



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DATE: 09/22/2025

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CONSTRUCTION DOCUMENTS

PROJECT: POOLER BASKETBALL COURTS

800 S. ROGERS ST
POOLER, GA

PREPARED FOR: CITY OF POOLER

100 US HIGHWAY 80 SW
POOLER, GA

#	Revision	Date
1	-	-
2	-	-
3	-	-

PROJECT NO.: 2025.143

SHEET NAME:

EROSION CONTROL PLAN - INITIAL

SHEET ISSUE DATE: 27-Oct-25

SCALE: 1" = 20'

DESIGNED: SP/SDA CHECKED: RS

SHEET NO.:

C-0.3

SHEET 3 OF 9



Know what's below.
Call before you dig.



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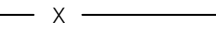
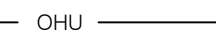
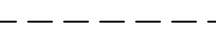


CITY OF POOLER

PROJECT NO.: 2025.143

C-0.4 SHEET 1 OF 2



- | | | | |
|---|--|---|------------------------|
|  | IRF |  | IRON REBAR FOUND |
| | |  | POST |
| | |  | UTILITY POLE |
| | |  | STORM DRAIN MANHOLE |
| | |  | SIGN |
| | |  | WATER VALVE |
| | |  | WATER VALVE MARKER |
| |  17.6 | | SPOT ELEVATION |
| |  | | FENCE |
| |  | | OVERHEAD UTILITY LINES |
| |  | | STORM DRAIN PIPE |
| |  | | TOP OF BANK |
| |  | | BOTTOM OF BANK |
| |  | | ASPHALT |
| |  | | CONCRETE |
| |  | | GRAVEL |

- ① REMOVE EXISTING CONCRETE PAVEMENT
- ② REMOVE EXISTING BASKETBALL GOAL/POST
- ③ REMOVE EXISTING TREE
- ④ PROTECT AND PRESERVE EXISTING TREE
- ⑤ REMOVE AND REPLACE WOOD POSTS
(REUSE IF SUITABLE)

1. CONTRACTOR TO COORDINATE WITH OWNER TO REMOVE ALL OUTDOOR FURNISHINGS (PICNIC TABLES, LITTER RECEPTACLES, ETC.) PRIOR TO CONSTRUCTION.

CRUSHED STONE CONSTRUCTION EXIT

EXIT DIAGRAM

ENTRANCE ELEVATION

NOTES:

1. AVOID LOCATING ON STEEP SLOPES OR AT CURVES ON PUBLIC ROADS.

2. REMOVE ALL VEGETATION AND OTHER UNSUITABLE MATERIAL FROM THE FOUNDATION AREA, GRADE, AND CROWN FOR POSITIVE DRAINAGE.

3. AGGREGATE SIZE SHALL BE IN ACCORDANCE WITH NATIONAL STONE ASSOCIATION R-2 (1.5"-3.5" STONE).

4. GRAVEL PAD SHALL HAVE A MINIMUM THICKNESS OF 6".

5. PAD WIDTH SHALL BE EQUAL FULL WIDTH AT ALL POINTS OF VEHICULAR EGRESS, BUT NO LESS THAN 20'.

6. A DIVERSION RIDGE SHOULD BE CONSTRUCTED WHEN GRADE TOWARD PAVED AREA IS GREATER THAN 2%.

7. INSTALL PIPE UNDER THE ENTRANCE IF NEEDED TO MAINTAIN DRAINAGE DITCHES.

8. WHEN WASHING IS REQUIRED, IT SHOULD BE DONE ON AN AREA STABILIZED WITH CRUSHED STONE THAT DRAINS INTO AN APPROVED SEDIMENT TRAP OR SEDIMENT BASIN (DIVERT ALL SURFACE RUNOFF AND DRAINAGE FROM THE ENTRANCE TO A SEDIMENT CONTROL DEVICE).

9. WASHRACKS AND/OR TIRE WASHERS MAY BE REQUIRED DEPENDING ON SCALE AND CIRCUMSTANCE. IF NECESSARY, WASHRACK DESIGN MAY CONSIST OF ANY MATERIAL SUITABLE FOR TRUCK TRAFFIC THAT REMOVE MUD AND DIRT.

10.MAINTAIN AREA IN A WAY THAT PREVENTS TRACKING AND/OR FLOW OF MUD ONTO PUBLIC RIGHTS-OF-WAYS. THIS MAY REQUIRE TOP DRESSING, REPAIR AND/OR CLEANOUT OF ANY MEASURES USED TO TRAP SEDIMENT.

SILT FENCE - TYPE NON-SENSITIVE

SIDE VIEW

FRONT VIEW

NOTES:

1. USE STEEL OR WOOD POSTS OR AS SPECIFIED BY THE EROSION, SEDIMENTATION, AND POLLUTION CONTROL PLAN.

2. HEIGHT (*) IS TO BE SHOWN ON THE EROSION, SEDIMENTATION, AND POLLUTION CONTROL PLAN.

CONCRETE WASHOUT

NTS

NOTES:

1. ACTUAL LAYOUT TO BE DETERMINED IN THE FIELD.

2. A CONCRETE WASHOUT SIGN SHALL BE INSTALLED WITHIN 30' OF THE TEMPORARY CONCRETE WASHOUT FACILITY.

3. MATERIALS USED TO CONSTRUCT TEMPORARY CONCRETE WASHOUT FACILITIES SHALL BE REMOVED FROM THE SITE OF THE WORK AND DISPOSED OF OR RECYCLED.

4. HOLES, DEPRESSIONS OR OTHER GROUND DISTURBANCE CAUSED BY THE REMOVAL OF THE TEMPORARY CONCRETE WASHOUT FACILITY SHALL BE BACKFILLED, REPAIRED, AND STABILIZED TO PREVENT EROSION.

TREE PROTECTION

CHAIN LINK FENCE DETAIL

FOR ADDED PROTECTION

-PROVIDE 4" DEEP ORGANIC MULCH OVER ANY UNPROTECTED ROOT ZONE.

-PROVIDE TEMPORARY IRRIGATION WHERE PRACTICAL AND FEASIBLE.

UNIFORM CODING SYSTEM

FOR SOIL EROSION AND SEDIMENT CONTROL PRACTICES

GEORGIA SOIL AND WATER CONSERVATION COMMISSION

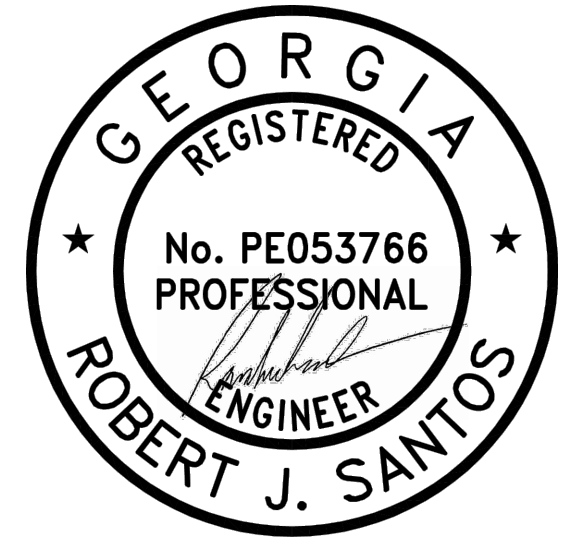
STRUCTURAL PRACTICES				
CODE	PRACTICE	DETAIL	MAP SYMBOL	DESCRIPTION
	CHECKDAM			A small temporary barrier or dam constructed across a swale, drainage ditch or area of concentrated flow.
Ch	CHANNEL STABILIZATION			Improving, constructing or stabilizing an open channel, existing stream, or ditch.
Co	CONSTRUCTION EXIT			A crushed stone pad located at the construction site exit to provide a place for removing mud from tires thereby protecting public streets.
Cr	CONSTRUCTION ROAD STABILIZATION			A travelway constructed as part of a construction plan including access roads, subdivision roads, parking areas and other on-site vehicle transportation routes.
Dc	STREAM DIVERSION CHANNEL			A temporary channel constructed to convey flow around a construction site while a permanent structure is being constructed.
Di	DIVERSION			An earth channel or dike located above, below, or across a slope to divert runoff. This may be a temporary or permanent structure.
Dn1	TEMPORARY DOWNSLOPE STRUCTURE			A flexible conduit of heavy-duty fabric or other material designed to safely conduct surface runoff down a slope. This is temporary and inexpensive.
Dn2	PERMANENT DOWNSLOPE STRUCTURE			A paved chute, pipe, sectional conduit or similar material designed to safely conduct surface runoff down a slope.
Fr	FILTER RING			A temporary stone barrier constructed at storm drain inlets and pond outlets.
Ga	GABION			Rock filter baskets which are hand-placed into position forming soil stabilizing structures.
Gr	GRADE STABILIZATION STRUCTURE			Permanent structures installed to protect channels or waterways where otherwise the slope would be sufficient for the running water to form gullies.
Lv	LEVEL SPREADER			A structure to convert concentrated flow of water into less erosive sheet flow. This should be constructed only on undisturbed soils.
Rd	ROCK FILTER DAM			A permanent or temporary stone filter dam installed across small streams or drainageways.
Re	RETAINING WALL			A wall installed to stabilize cut and fill slopes where maximum permissible slopes are not obtainable. Each situation will require special design.
Rt	RETRO FITTING			A device or structure placed in front of a permanent stormwater detention pond outlet structure to serve as a temporary sediment filter.
Sd1	SEDIMENT BARRIER			A barrier to prevent sediment from leaving the construction site. It may be sandbags, bales of straw or hay, brush, logs and poles, gravel, or a silt fence.
Sd2	INLET SEDIMENT TRAP			An impounding area created by excavating around a storm drain drop inlet. The excavated area will be filled and stabilized on completion of construction activities.
Sd3	TEMPORARY SEDIMENT BASIN			A basin created by excavation or a dam across a waterway. The surface water runoff is temporarily stored allowing the bulk of the sediment to drop out.
Sd4	TEMPORARY SEDIMENT TRAP			A small temporary pond that drains a disturbed area so that sediment can settle out. The principle feature distinguishing a temporary sediment trap from a temporary sediment basin is the lack of a pipe or riser.
Sk	FLOATING SURFACE SOMMER			A buoyant device that releases/drains water from the surface of sediment ponds, traps, or basins at a controlled rate of flow.
Spb	SEEP BERM			A linear control device constructed as a diversion perpendicular to the direction of the runoff to enhance dissipation and infiltration of runoff, while creating multiple sedimentation chambers with the employment of intermediate dikes.

STRUCTURAL PRACTICES				
CODE	PRACTICE	DETAIL	MAP SYMBOL	DESCRIPTION
Sr	TEMPORARY STREAM CROSSING			A temporary bridge or culvert-type structure protecting a stream or watercourse from damage by crossing construction equipment.
St	STORMDRAIN OUTLET PROTECTION			A paved or short section of riprap channel at the outlet of a storm drain system preventing erosion from the concentrated runoff.
Su	SURFACE ROUGHENING			A rough soil surface with horizontal depressions on a contour or slopes left in a roughened condition after grading.
Tc	TURBIDITY CURTAIN			A floating or staked barrier installed within the water (It may also be referred to as a floating boom, silt barrier, or silt curtain).
Tp	TOPSOILING			The practice of stripping off the more fertile soil, storing it, then spreading it over the disturbed area after completion of construction activities.
Tr	TREE PROTECTION			To protect desirable trees from injury during construction activity.
Wl	VEGETATED WATERWAY OR STORMWATER CONVEYANCE CHANNEL			Paved or vegetative water outlets for diversions, terraces, berms, dikes or similar structures.

VEGETATIVE PRACTICES				
CODE	PRACTICE	DETAIL	MAP SYMBOL	DESCRIPTION
Bf	BUFFER ZONE			Strip of undisturbed original vegetation, enhanced or restored existing vegetation or the reestablishment of vegetation surrounding an area of disturbance or bordering streams.
Cs	CONSTANT DUNE STABILIZATION (WITH VEGETATION)			Planting vegetation on dunes that are denuded, artificially constructed, or re-nourished.
Ds1	DISTURBED AREA STABILIZATION (WITH MULCHING ONLY)			Establishing temporary protection for disturbed areas where seedlings may not have a suitable growing season to produce an erosion retarding cover.
Ds2	DISTURBED AREA STABILIZATION (WITH TEMP. SEEDING)			Establishing a temporary vegetative cover with fast growing seedlings on disturbed areas.
Ds3	DISTURBED AREA STABILIZATION (WITH PERM. SEEDING)			Establishing a permanent vegetative cover such as trees, shrubs, vines, grasses, or legumes on disturbed areas.
Ds4	DISTURBED AREA STABILIZATION (SOODING)			A permanent vegetative cover using sods on highly erodible or critically eroded lands.
Du	DUST CONTROL ON DISTURBED AREAS			Controlling surface and air movement of dust on construction site, roadways and similar sites.
Fl-Co	FLOCCULANTS AND COAGULANTS			Substance formulated to assist in the solids/liquid separation of suspended particles in solution.
Sb	STREAMBANK STABILIZATION (USING NATIVE VEGETATION)			The use of readily available native plant materials to maintain and enhance streambanks, or to prevent, or restore and repair small streambank erosion problems.
Ss	SLOPE STABILIZATION			A protective covering used to prevent erosion and establish temporary or permanent vegetation on steep slopes, shore lines, or channels.
Tac	TACKERS AND BONDERS			Substance used to anchor straw or hay mulch by causing the organic material to bind together.



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CONSTRUCTION

DOCUMENTS

PROJECT: POOLER BASKETBALL COURTS

900 S. ROGERS ST
POOLER, GA

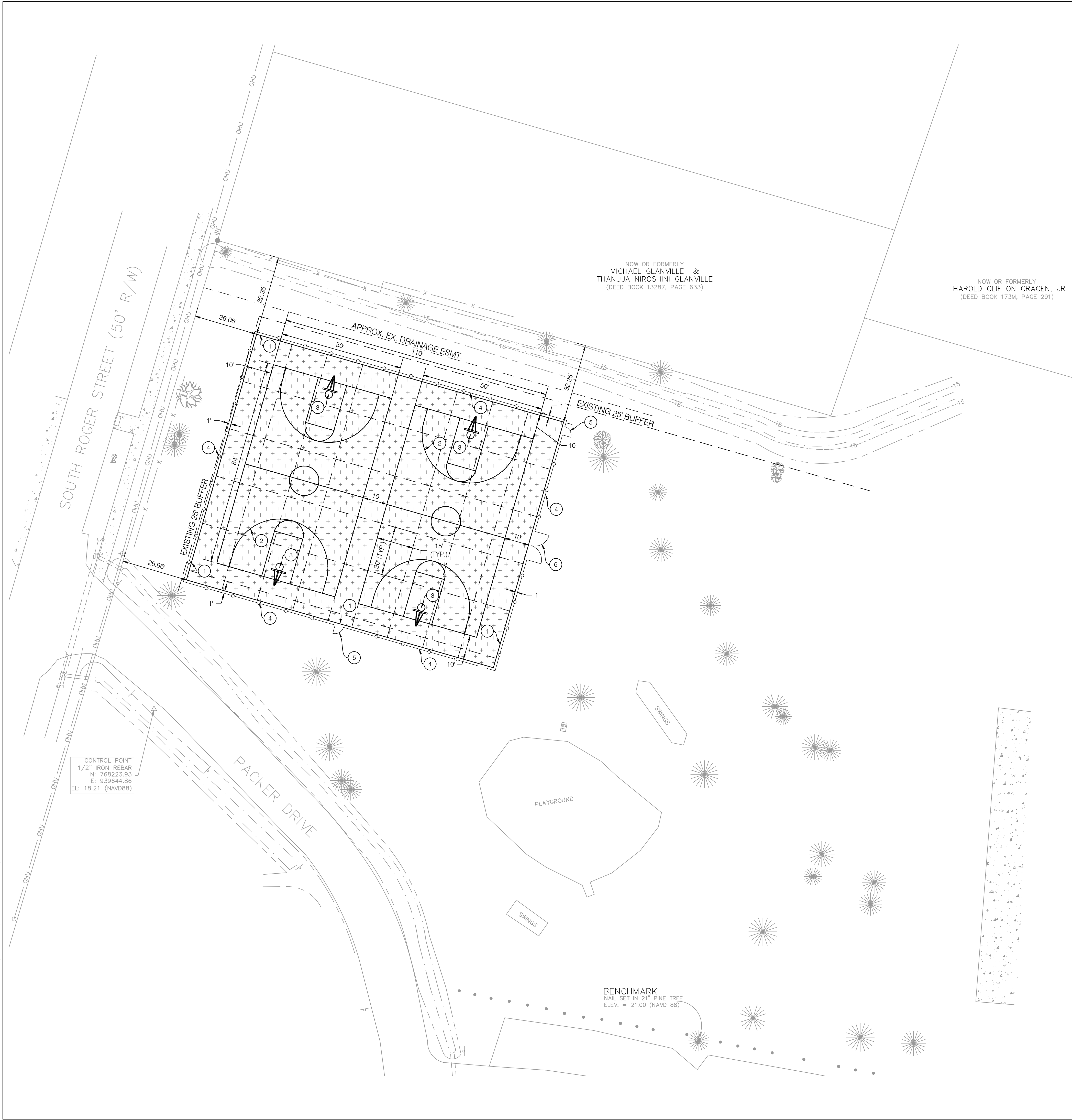
PREPARED FOR:

CITY OF POOLER

100 US HIGHWAY 80 SW
POOLER, GA

#	Revision	Date
1	-	-
2	-	-
3	-	-
PROJECT NO.: 2025.143		
SHEET NAME:		
EROSION CONTROL DETAILS		
SHEET ISSUE DATE:		27-Oct-25
SCALE:		NO SCALE
DESIGNED:	SP/SDA	CHECKED: RS
SHEET NO.:		C-0.5

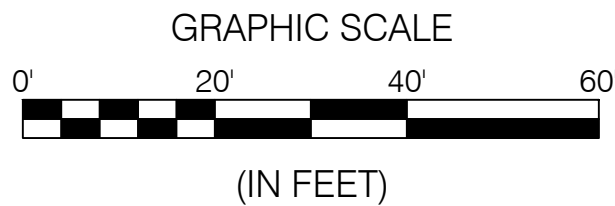
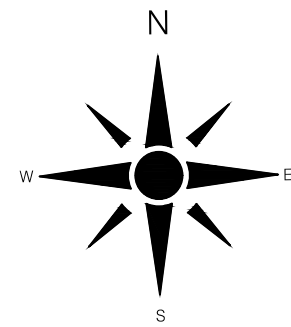
C:\Projects\2025\2025_143 Pooler GA - Basketball Courts Design\02 - Drawing\2025_143 SITE PLAN.dwg



SITE PLAN KEYNOTES

- PROPOSED EDGE OF BASKETBALL COURT PAVEMENT (SEE SITE DETAILS; SHEET C-1.1)
- PROPOSED STRIPING (2 IN. - WHITE PAINT; TYPICAL)
- PROPOSED BASKETBALL BACKBOARD & POST (SEE SITE DETAILS; SHEET C-1.1)
- PROPOSED 10' CHAIN LINK FENCE (SEE SITE DETAILS; SHEET C-1.1)
- PROPOSED PEDESTRIAN GATE (SEE SITE DETAILS; SHEET C-1.1)
- PROPOSED MAINTENANCE GATE (SEE SITE DETAILS; SHEET C-1.1)
- PROPOSED CONCRETE PAVEMENT EXPANSION JOINTS (SEE SITE DETAILS ALTERNATE; SHEET C-1.1)

PROPOSED PAVEMENT LEGEND



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CONSTRUCTION DOCUMENTS

PROJECT:
POOLER BASKETBALL COURTS

900 S. ROGERS ST
POOLER, GA

PREPARED FOR:
CITY OF POOLER

100 US HIGHWAY 80 SW
POOLER, GA

#	Revision	Date
1	-	-
2	-	-
3	-	-

PROJECT NO.: 2025.143

SHEET NAME:

SITE PLAN

SHEET ISSUE DATE: 27-Oct-25

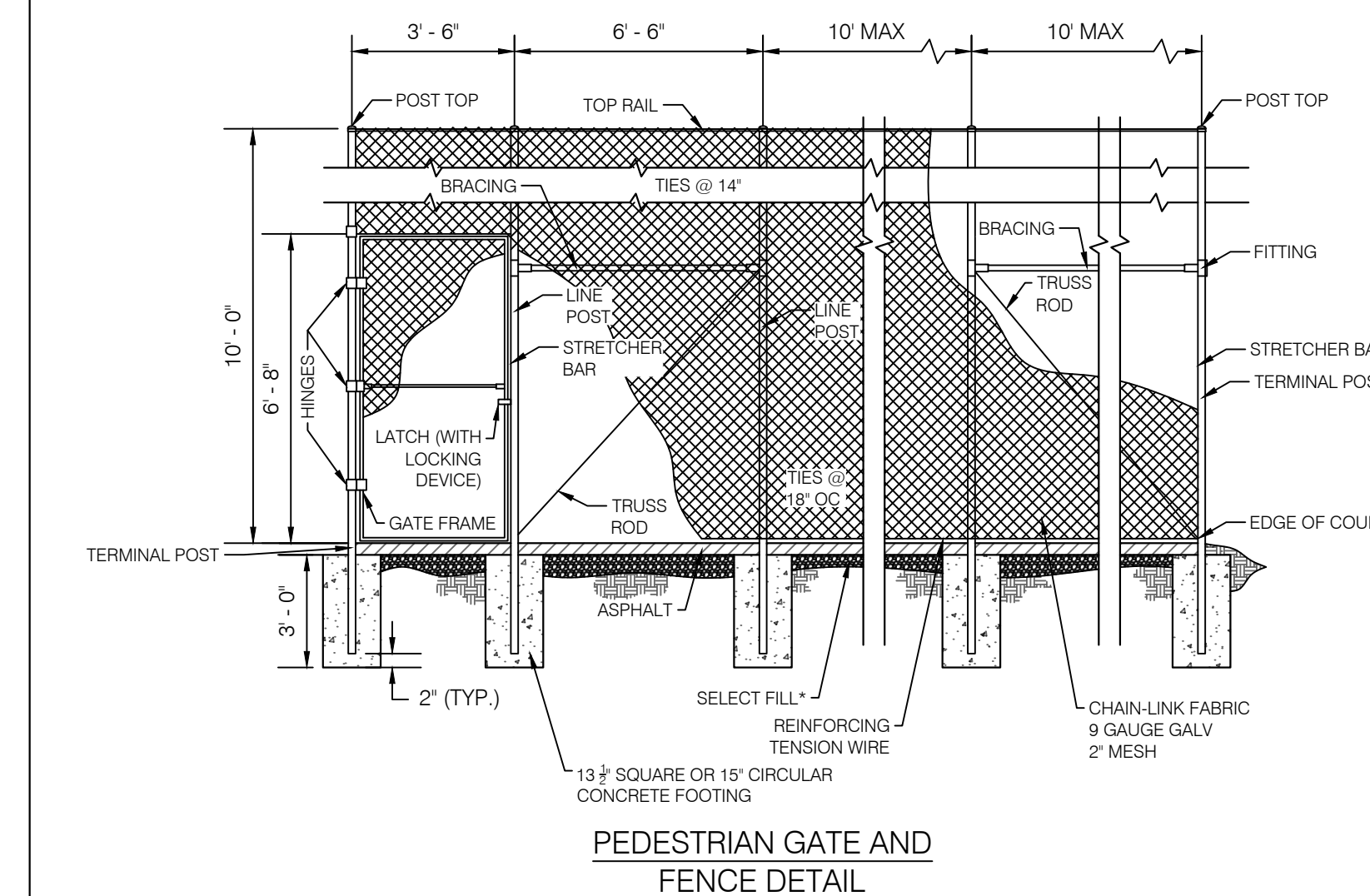
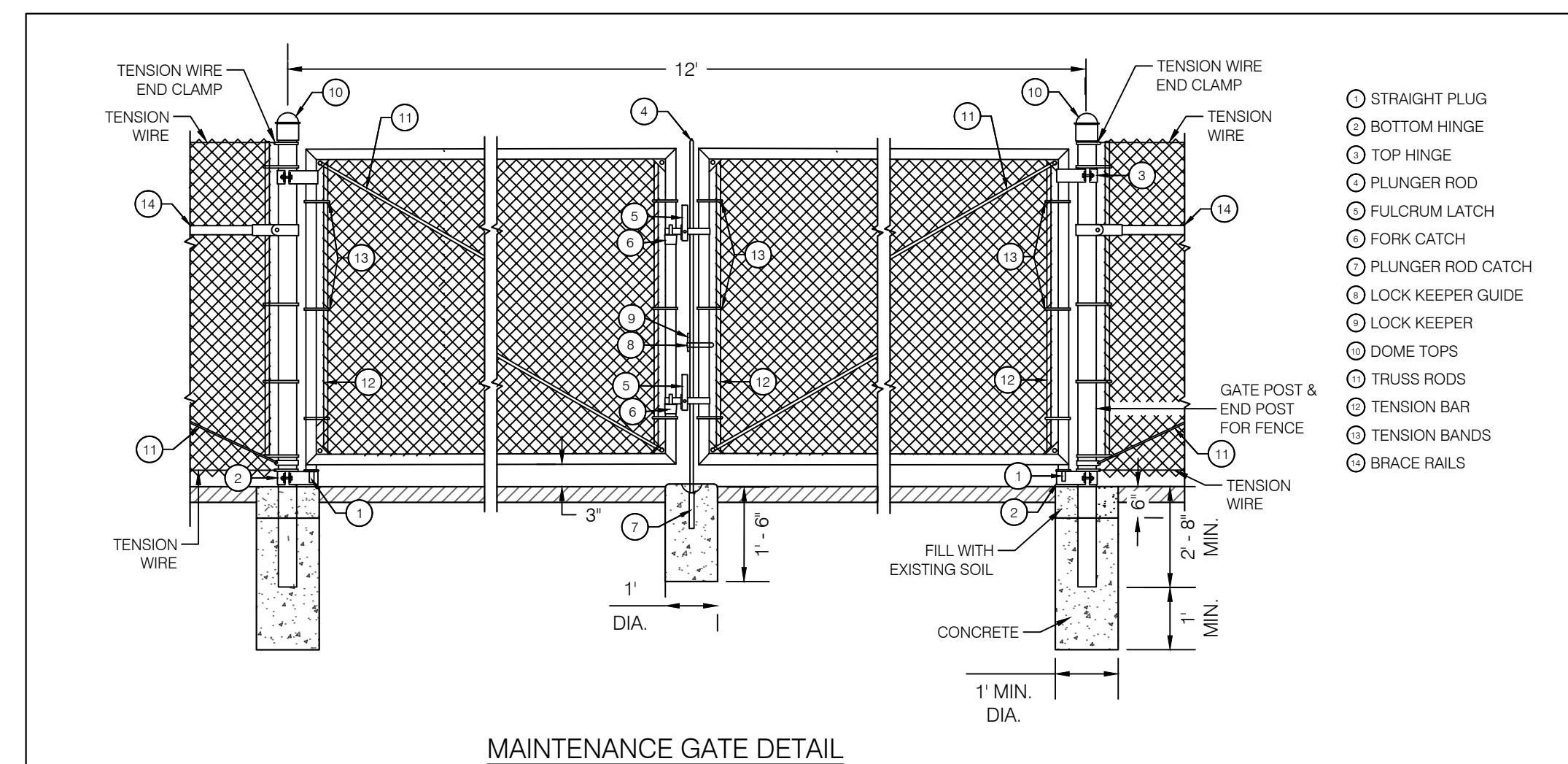
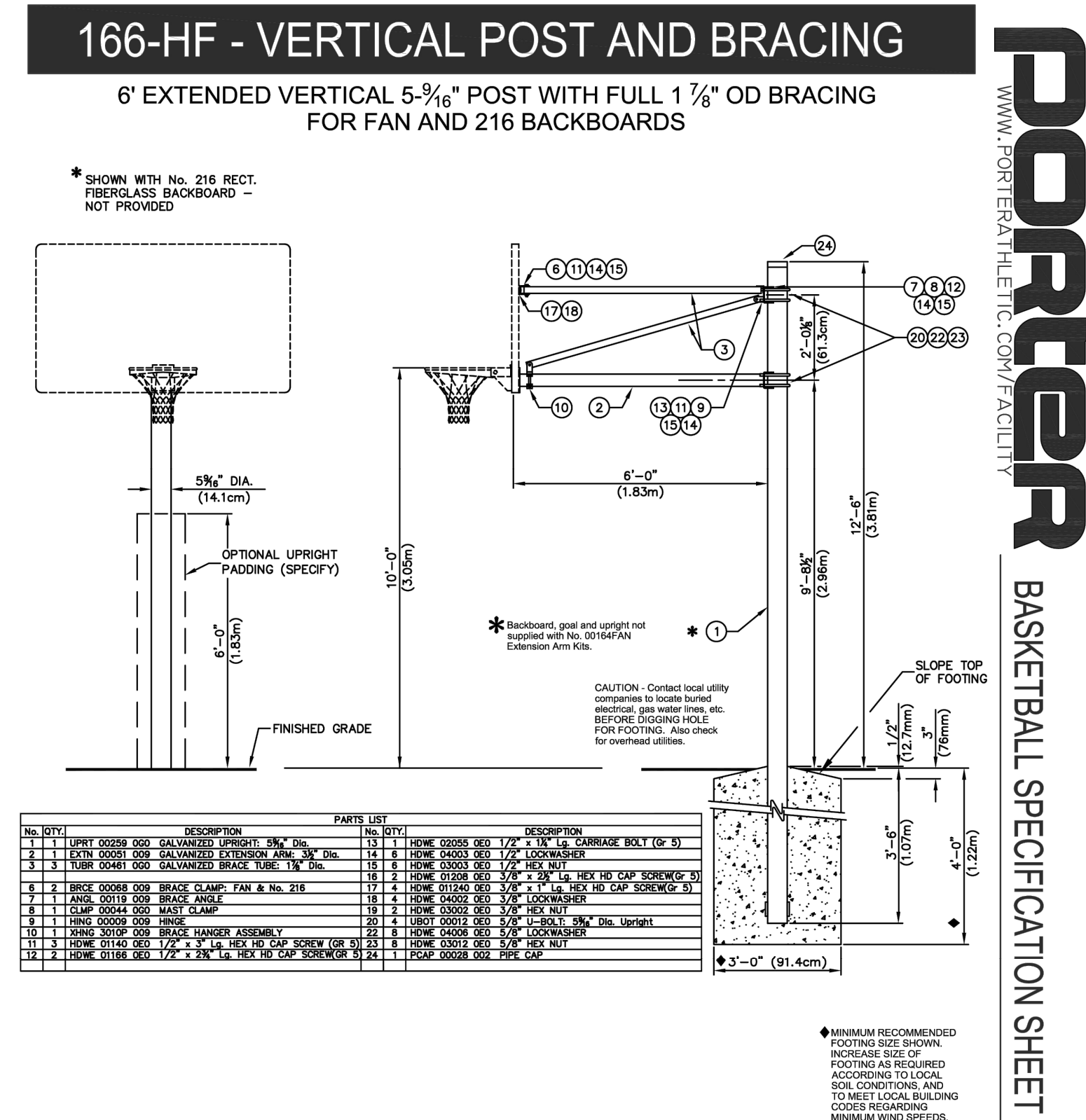
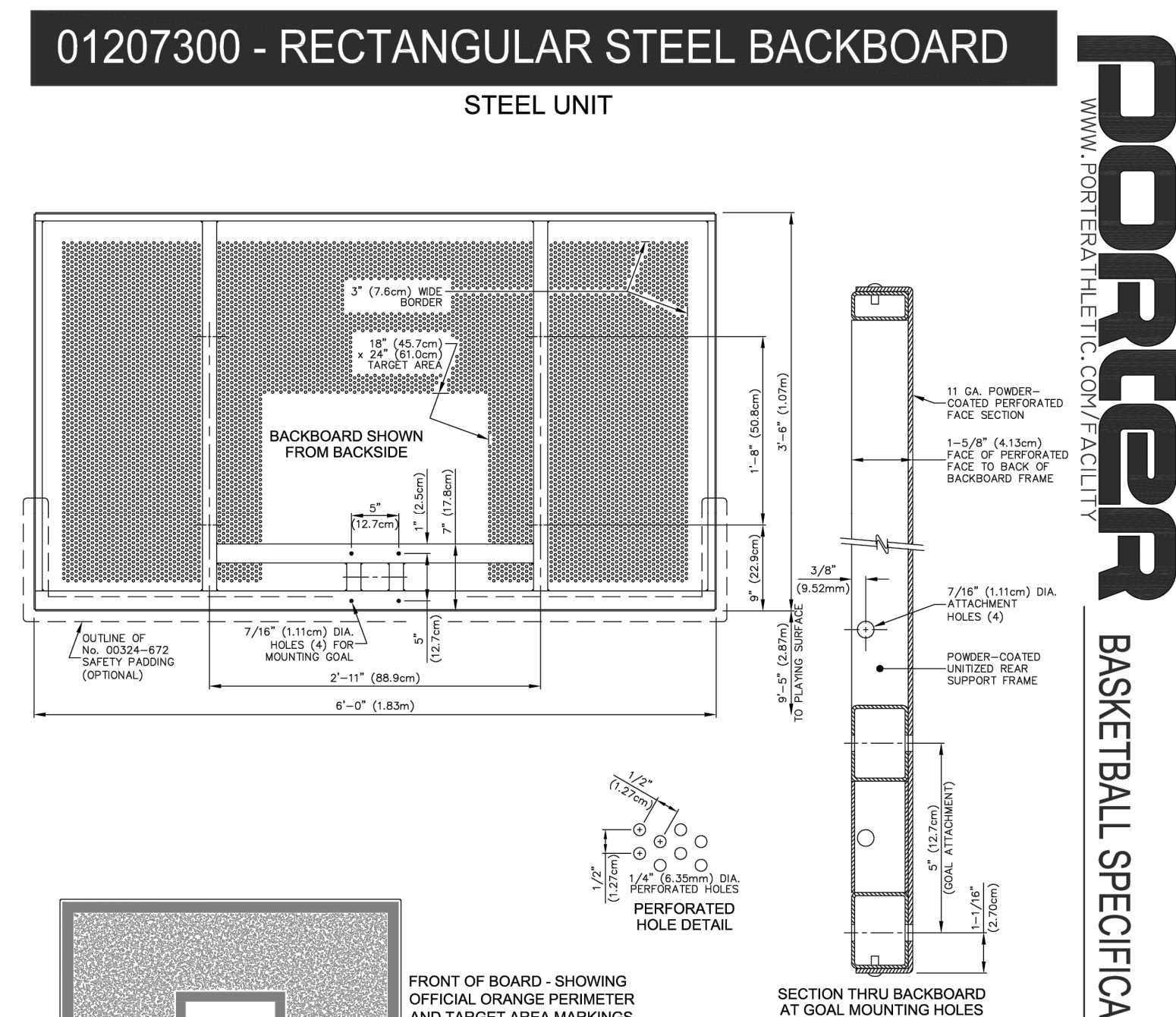
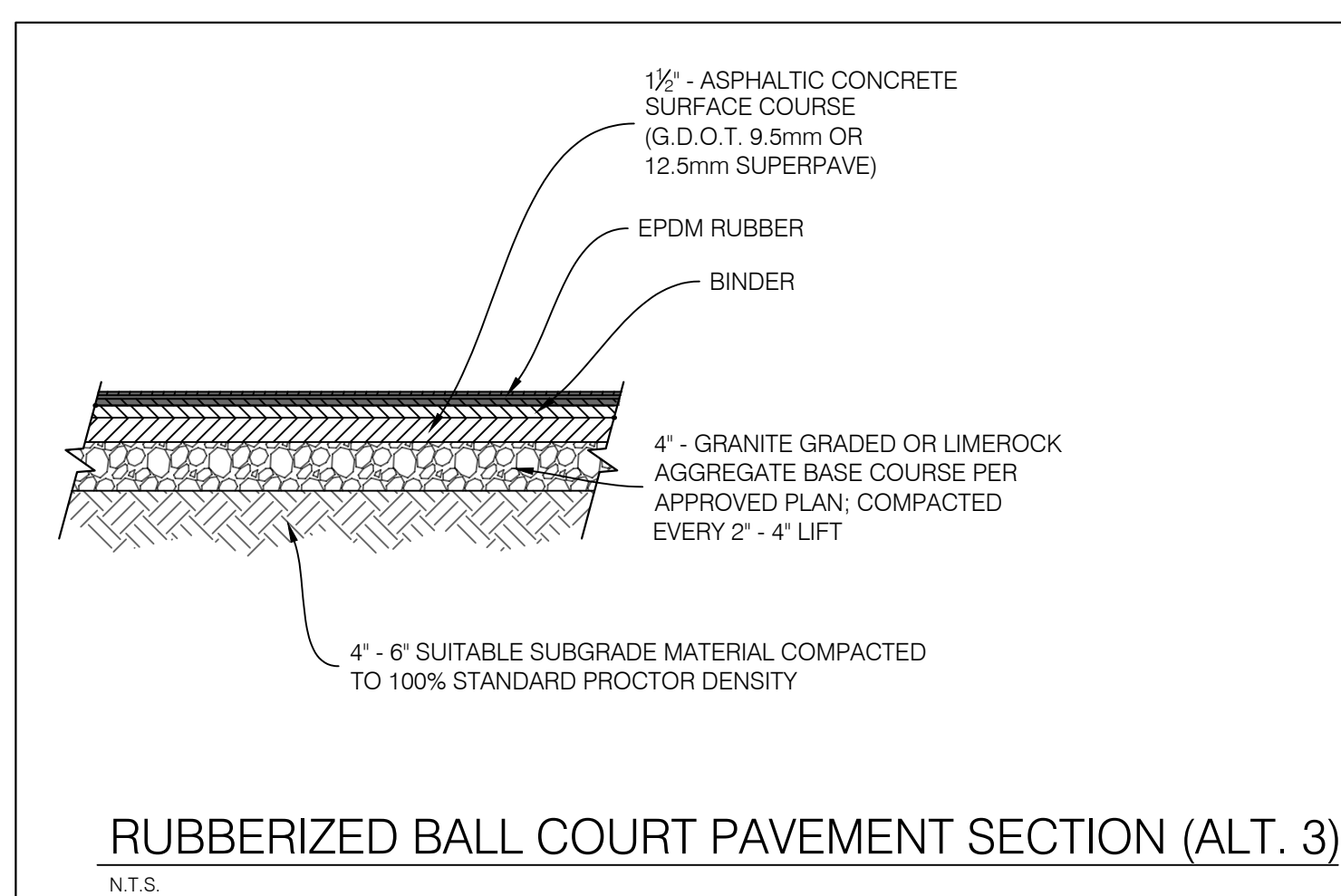
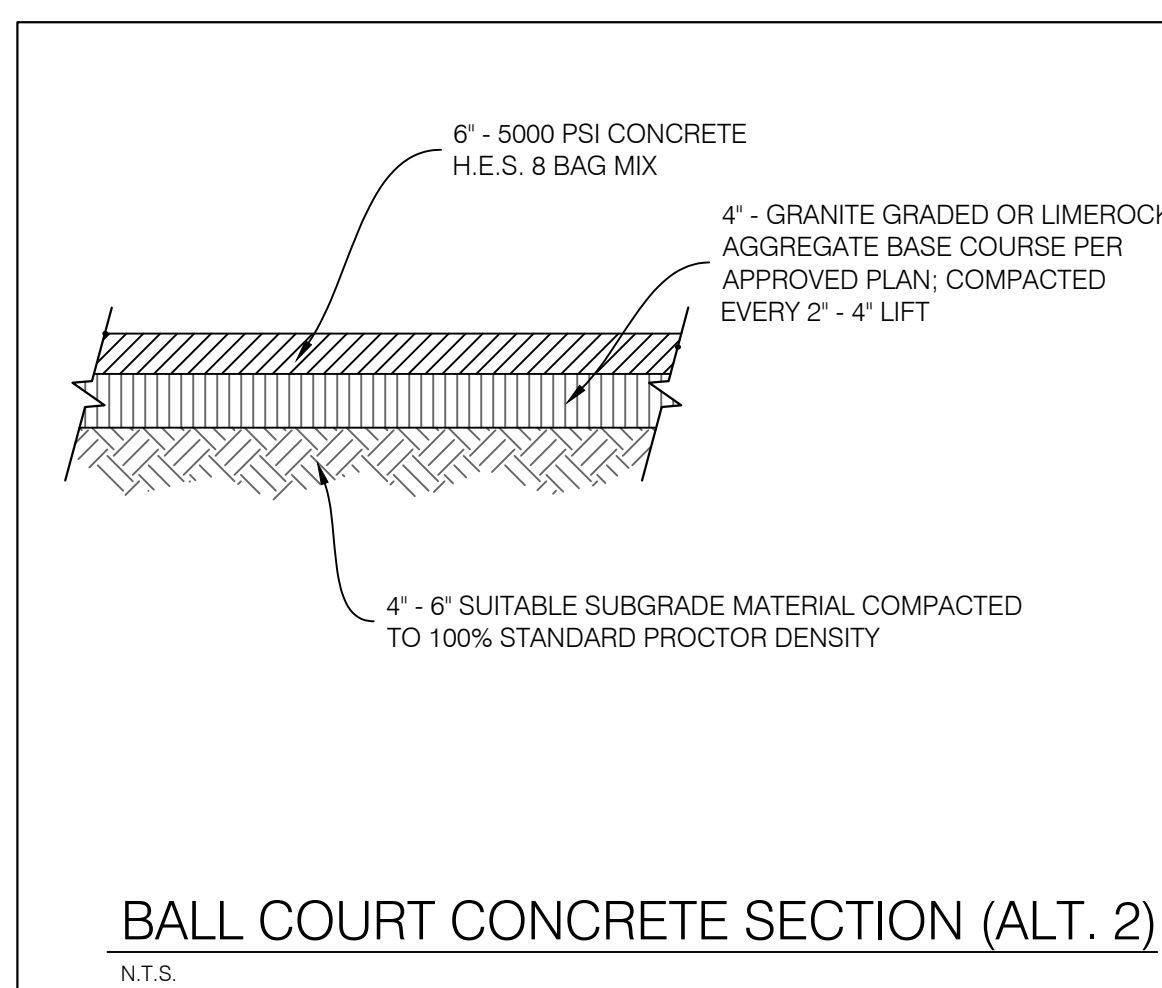
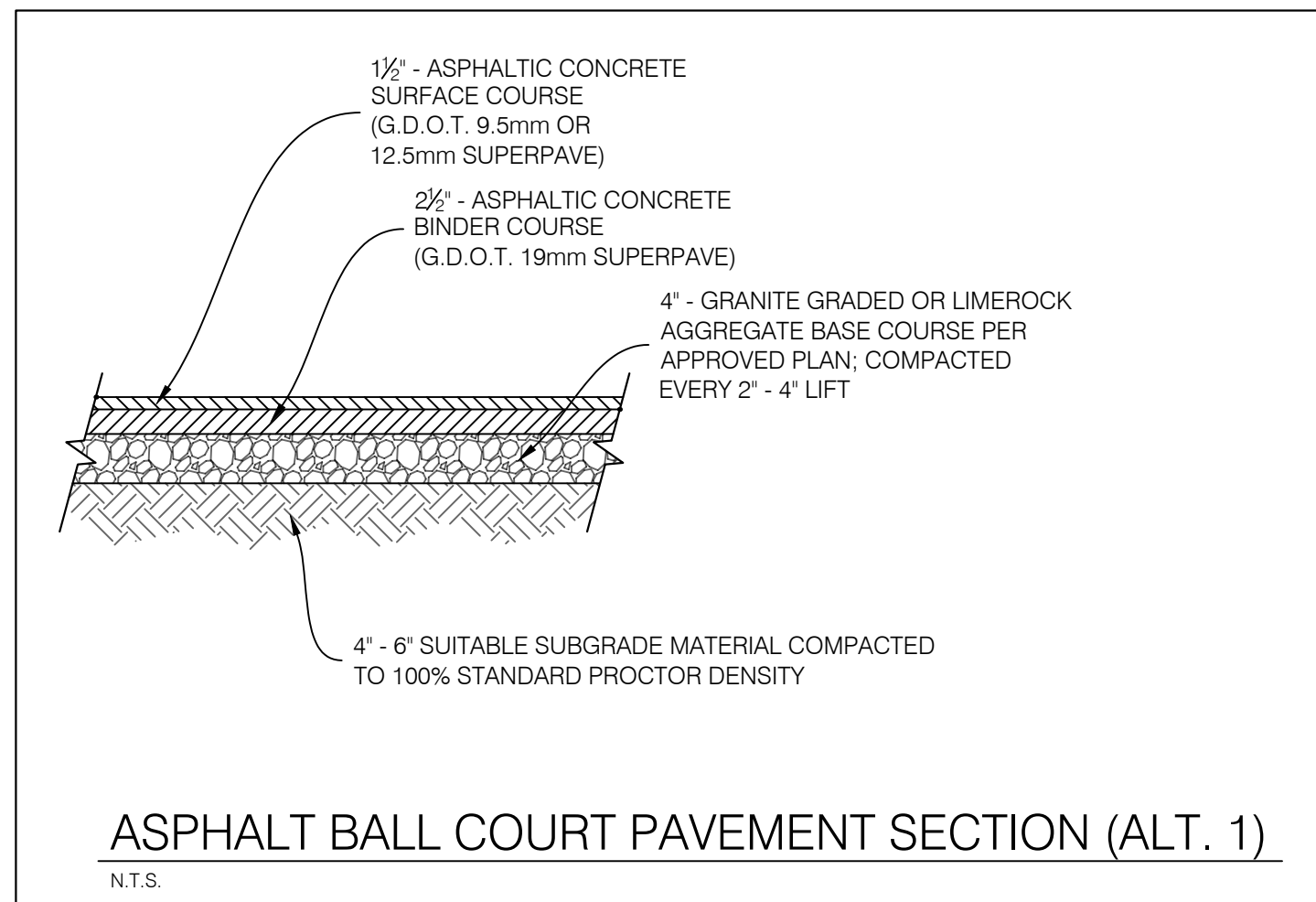
SCALE: 1" = 20'

DESIGNED: SP/SDA CHECKED: RS

SHEET NO.:

C-1.0

SHEET
6 OF 9



DESCRIPTION	MIN. SIZE IN INCHES	MIN. WEIGHT PER L.F. IN LBS
LINE POST	2.375 IN OD	3.65 LBS
TERMINAL POST	2.875 IN OD	5.79 LBS
TOP RAIL	1.660 IN OD	2.27 LBS
BRACING	1.660 IN OD	2.27 LBS
GATE FRAME	1.660 IN OD	2.27 LBS

NOTE:

VINYL COATED CHAIN LINK FABRIC SHALL BE ERECTED ON THE INTERIOR SIDE OF COURTS.

USE FENCE FABRIC KNUCKLED AT BOTH SELVAGES.

FOR LEAF GATES GREATER THAN 8 FT. WIDE, INSTALL INTERIOR VERTICAL BRACE RAIL AT 8 FT. INTERVALS.

FOR FABRIC HEIGHTS GREATER THAN 8 FT., INSTALL HORIZONTAL BRACE RAILS TO LEAF GATE.

MAXIMUM SAG FOR OUTER GATE MEMBER SHALL NOT EXCEED THE GREATER OF 1% OF THE LEAF GATE WIDTH OR 2 IN.

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CONSTRUCTION
DOCUMENTS

PROJECT: POOLER BASKETBALL COURTS

900 S. ROGERS ST

PREPARED FOR:

CITY OF POOLER

100 US HIGHWAY 80 SW

#	Revision	Date
1	-	-
2	-	-
3	-	-

PROJECT NO.: 2025.143

SHEET NAME

SITE DETAILS

SHEET ISSUE DATE: 27-Oct-25

SCALE:	NO SCALE
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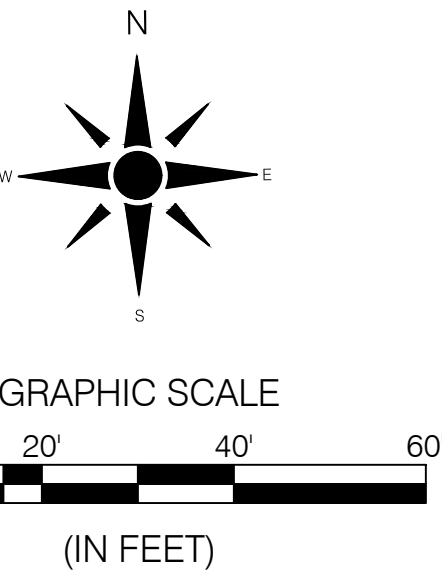
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SHEET NO.

C-1.1

SHEET
7 OF 9

C:\Projects\2025\2025.143 Pooler GA - Basketball Courts Design\02 - Drawing\2025.143 GRADING PLAN.dwg



GRADING PLAN LEGEND:

- EXISTING CONTOUR ——— 700 ———
PROPOSED CONTOUR ——— 700 ———
PROPOSED GRADE SPOT ELEVATION (M.E. XXXX.XX)
MATCH EXISTING SPOT ELEVATION (M.E. XXXX.XX)
LIMITS OF DISTURBANCE ——— LOD ———

AREA OF DISTURBANCE: 0.52 AC.



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CONSTRUCTION DOCUMENTS

PROJECT:
POOLER BASKETBALL COURTS

900 S. ROGERS ST
POOLER, GA

PREPARED FOR:
CITY OF POOLER

100 US HIGHWAY 80 SW
POOLER, GA

#	Revision	Date
1	-	-
2	-	-
3	-	-

PROJECT NO.: 2025.143

SHEET NAME:

GRADING PLAN

SHEET ISSUE DATE: 27-Oct-25

SCALE: 1" = 20'

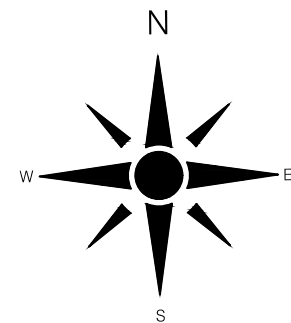
DESIGNED: SP/SDA CHECKED: RS

SHEET NO.:

C-2.0

SHEET
8 OF 9

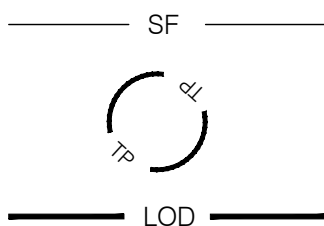
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GRAPHIC SCALE
0' 20' 40' 60'
(IN FEET)

EROSION CONTROL PLAN KEYNOTES

- Sd1** SILT FENCE
- Tr** TREE PROTECTION FENCE
- LOD** LIMITS OF DISTURBANCE
- Ds3** DISTURBED AREA STABILIZATION (WITH PERM SEEDING)
- Ss** SLOPE STABILIZATION



AREA OF DISTURBANCE: 0.52 AC.

CITY OF POOLER NOTES:

- ALL PROPOSED EROSION AND SEDIMENT CONTROL SHALL BE IN CONFORMANCE WITH CHAPTER 24 OF CHATHAM COUNTY DEVELOPMENT ORDINANCE AND GASWCC MANUAL FOR EROSION AND SEDIMENT CONTROL IN GEORGIA (LATEST EDITION). THE CONTRACTOR IS RESPONSIBLE FOR COMPLYING WITH THE REQUIREMENTS SET FORTH WITHIN THE MANUAL AND ALL OTHER APPLICABLE LAWS.

SWPPP CONTACT:

NAME: TBD
ADDRESS: TBD
TELEPHONE: TBD
EMAIL: TBD

SEEDING RATES FOR TEMPORARY & PERMANENT COVER					
MONTH	TEMPORARY COVER	RATES PER ACRE	MONTH	PERMANENT COVER	RATES PER ACRE
MARCH - JUNE	COMMON BERMUDA (HULLED)	10 lbs.	MARCH - JUNE	COMMON BERMUDA (HULLED)	10 lbs.
	WEEPING LOVEGRASS	4 lbs.		WEEPING LOVEGRASS	4 lbs.
APRIL - AUGUST	BROWN TOP MILLET SUDANGRASS PEARL MILLET	40 lbs. 60 lbs. 50 lbs.	JULY - AUGUST	COMMON BERMUDA (HULLED) & BROWN TOP MILLET	10 lbs. 10 lbs.
				COMMON BERMUDA (HULLED) & WEEPING LOVEGRASS	6 lbs. 2 lbs.
				COMMON BERMUDA (HULLED) & PENSACOLA BAHIA & BROWN TOP MILLET	6 lbs. 30 lbs. 10 lbs.
SEPT. - FEBRUARY	RYE (MOST WINTER HARDY) RYEGRASS BARLEY WHEAT	3 BU 40 lbs. 3 BU 3 BU		PENSACOLA BAHIA & BROWN TOP MILLET	60 lbs. 10 lbs.
				PENSACOLA BAHIA & WEEPING LOVEGRASS & BROWN TOP MILLET	30 lbs. 2 lbs. 10 lbs.
				WEEPING LOVEGRASS & BROWN TOP MILLET	4 lbs. 10 lbs.

NOTES:

- LISTED IN ORDER OF PREFERENCE.
- ALL PERMANENT GRASS PLANTINGS SHALL BE MULCHED

Ds2 NOTES:

- A TEMPORARY GRASSING OF ANNUAL RYEGRASS SHALL BE APPLIED AT A RATE OF 40 LBS. PER ACRE TO DISTURBED AREAS WITHIN 14 DAYS OF DISTURBANCE. THE PROPOSED ANNUAL RYEGRASS SHALL BE APPLIED DURING THE MONTHS OF SEPTEMBER THROUGH DECEMBER.
- A 6-12-12 FERTILIZER SHALL BE USED ON THE DISTURBED AREA OF Ds2 AND SHALL BE APPLIED AT A RATE OF 1500 LBS. PER ACRE.
- AGRICULTURAL LIME IS REQUIRED UNLESS SOIL TESTS INDICATE OTHERWISE.

Ds3 NOTES:

- A PERMANENT GRASSING OF UNHULLED COMMON BERMUDA SHALL BE APPLIED AT A RATE OF 10 LBS. PER ACRE DURING THE MONTHS OF SEPTEMBER THROUGH FEBRUARY. IF A HYDRAULIC SEEDER IS TO BE USED, REFER TO THE EROSION AND SEDIMENT CONTROL MANUAL FOR FURTHER DIRECTION ON THE METHOD OF APPLICATION
- A 6-12-12 FERTILIZER SHALL BE USED ON THE DISTURBED AREA OF Ds3 AND SHALL BE APPLIED AT A RATE OF 1500 LBS. PER ACRE.
- DRIED STRAW OR DRY HAY SHALL BE USED FOR MULCHING AND APPLIED AT A RATE OF 2 TONS PER ACRE. MULCH WILL BE SPREAD UNIFORMLY WITHIN 24 HOURS AFTER SEEDING. THE MULCH MAY BE SPREAD BY BLOWER-TYPE SPREADING EQUIPMENT, OTHER SPREADING EQUIPMENT, OR BY HAND. MULCH SHALL BE APPLIED TO COVER 75% OF THE SOIL SURFACE.
- AGRICULTURAL LIME IS REQUIRED AT A RATE OF 1 - 2 TONS PER ACRE UNLESS SOIL TESTS INDICATE OTHERWISE.



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Indianapolis, IN 46250
www.jqolusa.com



DATE: 09/22/2025

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CONSTRUCTION DOCUMENTS

PROJECT:
POOLER BASKETBALL COURTS
900 S. ROGERS ST
POOLER, GA

PREPARED FOR:
CITY OF POOLER
100 US HIGHWAY 80 SW
POOLER, GA

#	Revision	Date
1	-	-
2	-	-
3	-	-

PROJECT NO.: 2025.143

SHEET NAME:
EROSION CONTROL PLAN - FINAL

SHEET ISSUE DATE: 27-Oct-25

SCALE: 1" = 20'

DESIGNED: SP/SDA CHECKED: RS

SHEET NO.: C-3.0

SHEET 9 OF 9

SECTION 033000 - CAST-IN-PLACE CONCRETE

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Concrete standards.
2. Concrete materials.
3. Admixtures.
4. Fiber reinforcement.
5. Vapor retarders.
6. Floor and slab treatments.
7. Liquid floor treatments.
8. Curing materials.
9. Accessories.
10. Repair materials.
11. Concrete mixture materials.
12. Concrete mixture class types.
13. Concrete mixing.

B. Related Requirements:

1. Section 031000 "Concrete Forming and Accessories" for form-facing materials, form liners, insulating concrete forms, and waterstops.
2. Section 032000 "Concrete Reinforcing" for steel reinforcing bars and welded-wire reinforcement.
3. Section 035300 "Concrete Topping" for concrete floor toppings.
4. Section 312000 "Earth Moving" for drainage fill under slabs-on-ground.
5. Section 321313 "Concrete Paving" for concrete pavement and walks.

1.2 DEFINITIONS

A. Cementitious Materials: Portland cement or blended hydraulic cement alone or in combination with one or more of the following:

1. Fly ash, slag cement, other pozzolans, and silica fume; materials subject to compliance with requirements.

B. Water/Cementitious Materials (w/cm) Ratio: The ratio by weight of mixing water to cementitious materials.

1.3 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Pooler Basketball Courts 900 S Rogers Street Pooler, Ga 31322.

1. 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 inspections and acceptance testing of concrete at Project site.
 - c. Concrete Subcontractor.
 - d. 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.
 - o. Initial curing of standard-cured and field curing of field-cured test cylinders (ASTM C31/C31M.)
 - p. Protection of field cured field test cylinders.
 - q. Distribution of test reports.

1.4 ACTION SUBMITTALS

A. Product Data:

1. Portland cement.
2. Blended hydraulic cement.
3. Performance-based hydraulic cement.
4. Fly ash.
5. Slag cement.
6. Silica fume.
7. Natural or other pozzolans.
8. Aggregates.
9. Ground calcium carbonate and aggregate mineral fillers.
10. Admixtures:
 - a. Include limitations of use. Admixtures that do not comply with reference ASTM International requirements must be submitted with test data for approval.
11. Color pigments.

12. Fiber reinforcement.
13. Vapor retarders.
14. Floor and slab treatments.
15. Liquid floor treatments.
16. Curing materials.
 - a. Include documentation from color pigment manufacturer, indicating that proposed methods of curing are recommended by color pigment manufacturer.
17. Joint fillers.
18. Repair materials.

B. Sustainable Design Submittals:

1. Product Data: For recycled content, indicating postconsumer and preconsumer recycled content and cost.
2. Product Certificates: For indigenous materials, indicating location of material manufacturer and point of extraction, harvest, or recovery for each raw material. Include distance to Project, means of transportation, and cost for each indigenous material.
3. Laboratory Test Reports: For liquid floor treatments and curing and sealing compounds, indicating compliance with requirements for low-emitting materials.
4. Health Product Declaration (HPD): Provide documentation confirming product compliance with one of the following:
 - a. Inventory or HPD to at least 0.01 percent by weight with no GreenScreen LT-1 or GHS Category 1 hazards.
 - b. Inventory or HPD to at least 0.01 percent by weight, with at least 75 percent assessed using GreenScreen Benchmark assessment.
 - c. Third-party-verified Declare product label, designated "Red List Free."
 - d. Material Health Certificate or Cradle to Cradle certification with minimum Bronze level of Material Health.

C. Design Mixtures: For each concrete mixture, include the following:

1. Mixture identification.
2. Compressive strength at 28 days or other age as specified.
3. Compressive strength required at stages of construction.
4. Durability exposure classes for Exposure Categories F, S, W, and C.
5. Maximum w/cm ratio.
6. Calculated equilibrium and fresh density for lightweight concrete.
7. Slump or slump flow limit.
8. Air content.
9. Nominal maximum aggregate size.
10. Steel-fiber reinforcement content.
11. Synthetic microfiber content.
12. Synthetic macrofiber content.
13. Intended placement method.
14. Submit adjustments to design mixtures when characteristics of materials, Project conditions, weather, test results, or other circumstances warrant changes.

D. Shop Drawings:

1. Construction Joint Layout: Indicate proposed construction joints required to construct the structure.
 - a. Location of construction joints is subject to approval of the Architect.
- E. Concrete Schedule: For each location of each class of concrete indicated in "Concrete Mixture Class Types" Article, including the following:
 1. Concrete class designation.
 2. Location within Project.
 3. Exposure class designation.
 4. Formed surface finish designation and final finish.
 5. Final finish for floors.
 6. Floor treatment, if any.

1.5 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For the following:
 1. Installer: Include copies of applicable ACI certificates.
 2. Testing Agency: Include documentation indicating compliance with ASTM E329 or ASTM C1077 and copies of applicable ACI certificates for testing technicians or ACI Concrete Construction Special Inspector - MH, ASCC.
- B. Material Certificates: For each of the following:
 1. Cementitious materials.
 2. Admixtures.
 3. Fiber reinforcement.
 4. Curing compounds.
 5. Floor and slab treatments.
 6. Bonding agents.
 7. Adhesives.
 8. Vapor retarders.
 9. Semirigid joint filler.
 10. Joint-filler strips.
 11. Repair materials.
- C. Material Test Reports: For the following:
 1. Portland cement.
 2. Blended hydraulic cement.
 3. Performance-based hydraulic cement.
 4. Fly ash.
 5. Slag cement.
 6. Silica fume.
 7. Natural or other pozzolans.
 8. Aggregates.
 9. Ground calcium carbonate and aggregate mineral filler.
 10. Admixtures.

- D. Floor surface flatness and levelness measurements report, indicating compliance with specified tolerances in accordance with ACI 117 and in compliance with ASTM E1155.
- E. Research Reports:
 - 1. For concrete admixtures in accordance with ICC's Acceptance Criteria AC198.
 - 2. For sheet vapor retarder/termite barrier, showing compliance with ICC's Acceptance Criteria AC380.
- F. Preconstruction Test Reports: For each mix design.
- G. Field quality-control reports.
- H. Minutes of preinstallation conference.

1.6 QUALITY ASSURANCE

- A. Installer Qualifications: A qualified Installer who employs Project personnel qualified as an ACI-certified Concrete Flatwork Associate and Concrete Flatwork Finisher and a supervisor who is a certified ACI Advanced Concrete Flatwork Finisher/Technician or an ACI Concrete Flatwork Finisher with experience installing and finishing concrete.
 - 1. Post-Installed Concrete Anchors Installers: ACI-certified Adhesive Anchor Installer.
- B. Ready-Mixed Concrete Manufacturer Qualifications: A firm experienced in manufacturing ready-mixed concrete products and that complies with ASTM C94/C94M requirements for production facilities and equipment.
 - 1. Manufacturer's production facilities and delivery vehicles certified in accordance with NRMCA's certification requirements or equivalent approval by a State DOT.
- C. Laboratory Testing Agency Qualifications: A testing agency qualified in accordance with ASTM C1077 and ASTM E329 for testing that performs duties on behalf of the Architect/Engineer.
 - 1. Personnel performing laboratory tests to be an ACI-certified Concrete Strength Testing Technician and Concrete Laboratory Testing Technician, Level 1. Testing agency laboratory supervisor tests to be an ACI-certified Concrete Laboratory Testing Technician, Level 2.
- D. Field Quality-Control Testing Agency Qualifications: An independent agency acceptable to City of Pooler, GA, qualified in accordance with ASTM C1077 and ASTM E329 for testing indicated.
 - 1. Personnel conducting field tests on plastic concrete properties are to be qualified as an ACI Concrete Field Testing Technician, Grade 1, in accordance with policies from ACI CPP 610.1 or an equivalent certification program.

1.7 PRECONSTRUCTION TESTING

- A. Preconstruction Testing Service: Engage a qualified testing agency to perform preconstruction testing on each concrete mixture.
 - 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.
 - f. Evaluation of permeability-reducing admixtures.

1.8 DELIVERY, STORAGE, AND HANDLING

- A. Comply with ASTM C94/C94M and ACI 301.

1.9 FIELD CONDITIONS

- A. Cold-Weather Placement: Comply with ACI 301 as follows:
 - 1. Protect concrete work from physical damage or reduced strength that could be caused by frost, freezing actions, or low temperatures.
 - 2. When air temperature has fallen to or is expected to fall below 40 deg F during the protection period, 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 in contact with surfaces less than 35 deg F, other than reinforcing steel.
- B. Hot-Weather Placement: Comply with ACI 301 and ACI 305.1, and as follows:
 - 1. Maintain concrete temperature at time of discharge to not exceed 95 deg F.
 - 2. Fog-spray forms, steel reinforcement, and subgrade just before placing concrete. Keep subgrade uniformly moist without standing water, soft spots, or dry areas.

1.10 WARRANTY

- A. Manufacturer's Warranty: Manufacturer agrees to furnish replacement sheet vapor retarder/termite barrier material and accessories for sheet vapor retarder/ termite barrier and accessories that do not comply with requirements or that fail to resist penetration by termites within specified warranty period.
 - 1. Warranty Period: 10 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 CONCRETE STANDARDS

- A. ACI Publications: Comply with ACI 301 unless modified by requirements in the Contract Documents.

2.2 CONCRETE MATERIALS

- A. Regional Materials: Concrete shall be manufactured within 100 miles of Project site from aggregates that have been extracted, harvested, or recovered, as well as manufactured, within 100 miles of Project site.
- B. Indigenous Materials: Concrete shall be manufactured within 500 miles of Project site from aggregates that have been extracted, harvested, or recovered, as well as manufactured, within 500 miles of Project site. If materials are transported by rail or water, the distance transported by rail or water shall be multiplied by 0.25 to determine the distance to Project site.
- C. Source Limitations:
 - 1. Obtain all concrete mixtures from a single ready-mixed concrete manufacturer for entire Project.
 - 2. Obtain each type of admixture from single source from single manufacturer.
- D. Cementitious Materials:
 - 1. Portland Cement: ASTM C150/C150M, Type I, gray
 - 2. Blended Hydraulic Cement: ASTM C595/C595M, cement.
 - 3. Performance-Based Hydraulic Cement: ASTM C1157/C1157M: Type GU, general use.
 - 4. Pozzolans: ASTM C618, Class C, F, or N.
 - 5. Slag Cement: ASTM C989/C989M, Grade 100 or 120.
 - 6. Ground Glass Pozzolan: ASTM C1866/C1866M, Type GS or GE.
 - 7. Silica Fume: ASTM C1240.
- E. Normal-Weight Aggregates:
 - 1. Coarse Aggregate: ASTM C33/C33M, Class 1N
 - 2. Maximum Coarse-Aggregate Size: 3/4 inch nominal.
 - 3. Fine Aggregate: ASTM C33/C33M.
 - 4. Recycled Aggregate: Provide documentation of characteristics of recycled aggregate and mechanical properties and durability of proposed concrete, which incorporates recycled aggregate to conform to applicable requirements for the class of concrete.
 - 5. Alkali-Silica Reaction: Comply with one of the following for each aggregate used:
 - a. Expansion Result of Aggregate: Not more than 0.04 percent at one year when tested in accordance with ASTM C1293.

- b. Expansion Results of Aggregate and Cementitious Materials in Combination: Not more than 0.10 percent at an age of 16 days when tested in accordance with ASTM C1567. Do not use this option with fly ash with an alkali content greater than 4.0 percent. Submit supporting data for each aggregate showing expansion in excess of 0.10 percent when tested in accordance with ASTM C1260.
 - c. Alkali Content in Concrete: Not to exceed 4 lb./cu. yd. for aggregate with expansion greater than or equal to 0.04 percent and less than 0.12 percent or 3 lb./cu. yd. for aggregate with expansion greater than or equal to 0.12 percent and less than 0.24 percent. Test aggregate reactivity in accordance with ASTM C1293. Calculate alkali content of concrete in accordance with ACI 301. Do not use this option with natural pozzolan or fly ash that has a calcium oxide content greater than 18 percent or an alkali content greater than 4.0 percent; or for an aggregate with expansion at one year greater than or equal to 0.24 percent when tested in accordance with ASTM C1293.
- F. Lightweight Aggregate: ASTM C330/C330M, 1-inch 3/4-inch 1/2-inch 3/8-inch nominal maximum aggregate size.
 - 1. Limit lightweight aggregate for internal curing to prewetted lightweight fine aggregate in accordance with ASTM C1761/C1761M.
- G. Ground Calcium Carbonate or Aggregate Mineral Filler: ASTM C1797. Unless otherwise permitted, do not use mineral filler derived from carbonate sources in concrete for members assigned to Exposure Class S1, S2, or S3.

2.3 ADMIXTURES

- A. Air-Entraining Admixture: ASTM C260/C260M.
- B. Chemical Admixtures: Do not use calcium chloride or admixtures containing calcium chloride in steel-reinforced concrete.
 - 1. Water-Reducing Admixture: ASTM C494/C494M, Type A.
 - a. Manufacturers: Subject to compliance with requirements:
 - 1) Euclid Chemical Company (The); a subsidiary of RPM International, Inc.
 - 2) GCP Applied Technologies Inc.
 - 3) MAPEI Corporation.
 - 4) Master Builders Solutions; brand of MBCC Group.
 - 5) Sika Corporation.
 - 2. Permeability-Reducing Admixture: ASTM C494/C494M, Type S, hydrophilic, permeability-reducing crystalline or colloidal nano-silica admixture, capable of reducing water absorption of concrete exposed to hydrostatic pressure (PRAH).
 - a. Manufacturers: Subject to compliance with requirements:
 - 1) AQUAFIN, Inc.
 - 2) AVECS LLC.

- 3) Barrier One, Inc.
 - 4) Bone Dry Products, Inc.
 - 5) ISE Logik Industries, Inc.
 - 6) Kryton International, Inc.
 - 7) Master Builders Solutions; brand of MBCC Group.
 - 8) Penetron International, Ltd.
 - 9) Xypex Chemical Corporation.
- b. Permeability: No leakage when tested in accordance with U.S. Army Corps of Engineers CRD C48 at a hydraulic pressure of 200 psi for 14 days.
3. Moisture-Vapor-Reducing Admixture: ASTM C494/C494M, Type S, hydrophilic, moisture-vapor-reducing, capable of reducing water absorption in and moisture-vapor emission from concrete (MVRA).
- a. Manufacturers: Subject to compliance with requirements:
- 1) AQUAFIN, Inc.
 - 2) AVECS LLC.
 - 3) Barrier One, Inc.
 - 4) Concure Products Inc.
 - 5) ISE Logik Industries, Inc.
 - 6) Kryton International, Inc.
 - 7) Master Builders Solutions; brand of MBCC Group.
 - 8) Moxie International.
 - 9) Penetron International, Ltd.
 - 10) Xypex Chemical Corporation.
- C. Color Pigment: ASTM C979/C979M, synthetic mineral-oxide pigments, color stable, free of carbon black, nonfading, and resistant to lime and other alkalis.
1. Manufacturers: Subject to compliance with requirements,:
- a. Alabama Pigments Company, LLC.
 - b. Bon Tool Co.
 - c. Brickform; a division of Solomon Colors.
 - d. Butterfield Color, Inc.
 - e. Dynamic Color Solutions, Inc.
 - f. Euclid Chemical Company (The); a subsidiary of RPM International, Inc.
 - g. Hoover Color Corporation.
 - h. Lambert Corporation.
 - i. Lanxess Corporation.
 - j. Master Builders Solutions; brand of MBCC Group.
 - k. Matcrete Inc.
 - l. NewLook International, Inc.
 - m. Proline Concrete Tools, Inc.
 - n. QC Construction Products.
 - o. Scofield, a Business Unit of Sika Corporation.
 - p. Solomon Colors Inc.
 - q. Stampcrete International, Ltd.
 - r. SureCrete Design Products, a Fenix Group SPC Company.

- s. Venator Materials PLC.
- 2. Color: As indicated by manufacturer's designation.
- D. Mixing Water for Concrete Mixtures and Water Used to Make Ice: ASTM C1602/C1602M. Include documentation of compliance with limits for alkalis, sulfates, chlorides, or solids content of mixing water from Table 2 in ASTM C1602/C1602M.

2.4 FIBER REINFORCEMENT

- A. Carbon-Steel-Wire Fiber: ASTM A820/A820M, Type 1, cold-drawn wire, deformed, minimum of 2 inches long, with an aspect ratio of 45 to 50
 - 1. Manufacturers: Subject to compliance with requirements,:
 - a. Bekaert.
 - b. Euclid Chemical Company (The); a subsidiary of RPM International, Inc.
 - c. FullForce by ABC Polymer Industries, LLC.
 - d. Sika Corporation.
- B. Carbon-Steel Cut Sheet Fiber: ASTM A820/A820M, Type 2, cut sheet, deformed, minimum of 2 inches long, and aspect ratio of 45 to 50
 - 1. Manufacturers: Subject to compliance with requirements,:
 - a. Concrete Fiber Solutions.
 - b. Fibercon International, Inc.
 - c. Sika Corporation.
- C. Synthetic Monofilament Microfiber: Monofilament polypropylene microfibers complying with ASTM C1116/C1116M, Type III, 1/2 to 1-1/2 inches long.
 - 1. Manufacturers: Subject to compliance with requirements,:
 - a. Euclid Chemical Company (The); a subsidiary of RPM International, Inc.
 - b. FullForce by ABC Polymer Industries, LLC.
 - c. GCP Applied Technologies Inc.
 - d. MAPEI Corporation.
 - e. Master Builders Solutions; brand of MBCC Group.
 - f. Sika Corporation.
 - g. >.
- D. Synthetic Fibrillated Microfiber: Fibrillated polypropylene microfibers complying with ASTM C1116/C1116M, Type III, 1/2 to 1-1/2 inches long.
 - 1. Manufacturers: Subject to compliance with requirements,:
 - a. Euclid Chemical Company (The); a subsidiary of RPM International, Inc.
 - b. FullForce by ABC Polymer Industries, LLC.
 - c. GCP Applied Technologies Inc.
 - d. Master Builders Solutions; brand of MBCC Group.

- e. Sika Corporation.
- E. Synthetic Macrofiber: Synthetic macrofibers complying with ASTM C1116/C1116M, Type III, 1 to 2-1/4 inches long.
- 1. Manufacturers: Subject to compliance with requirements,
 - a. Euclid Chemical Company (The); a subsidiary of RPM International, Inc.
 - b. FullForce by ABC Polymer Industries, LLC.
 - c. GCP Applied Technologies Inc.
 - d. MAPEI Corporation.
 - e. Master Builders Solutions; brand of MBCC Group.
 - f. Sika Corporation.

2.5 FLOOR AND SLAB TREATMENTS

- A. Slip-Resistive Emery Aggregate Finish: Factory-graded, packaged, rustproof, nonglazing, abrasive, crushed emery aggregate containing not less than 50 percent aluminum oxide and not less than 20 percent ferric oxide; unaffected by freezing, moisture, and cleaning materials with 100 percent passing 3/8-inch No. 4 sieve.
- 1. Manufacturers: Subject to compliance with requirements,
 - a. Anti-Hydro International, Inc.
 - b. Dayton Superior Corporation.
 - c. Lambert Corporation.
 - d. Laticrete International, Inc.
 - e. Metalcrete Industries.
- B. Slip-Resistive Aluminum Granule Finish: Factory-graded, packaged, rustproof, nonglazing, abrasive aggregate of not less than 95 percent fused aluminum-oxide granules.
- 1. Manufacturers: Subject to compliance with requirements,
 - a. Anti-Hydro International, Inc.
 - b. Laticrete International, Inc.
 - c. Master Builders Solutions; brand of MBCC Group.
- C. Emery Dry-Shake Floor Hardener: Unpigmented, factory-packaged, dry combination of portland cement, graded emery aggregate, and plasticizing admixture; with emery aggregate consisting of no less than 60 percent of total aggregate content.
- 1. Color. Grey
- D. Metallic Dry-Shake Floor Hardener: Pigmented Unpigmented, factory-packaged, dry combination of portland cement, graded metallic aggregate, rust inhibitors, and plasticizing admixture; with metallic aggregate consisting of no less than 65 percent of total aggregate content.
- 1. Color:

- E. Unpigmented Mineral Dry-Shake Floor Hardener: Factory-packaged dry combination of portland cement, graded quartz aggregate, and plasticizing admixture.

1. Manufacturers: Subject to compliance with requirements,:
 - a. Dayton Superior Corporation.
 - b. Euclid Chemical Company (The); a subsidiary of RPM International, Inc.
 - c. Kaufman Products, Inc.
 - d. Laticrete International, Inc.
 - e. Master Builders Solutions; brand of MBCC Group.
 - f. Metalcrete Industries.
 - g. SpecChem, LLC.
 - h. US MIX Co.
 - i.

- F. Pigmented Mineral Dry-Shake Floor Hardener: Factory-packaged, dry combination of portland cement, graded quartz aggregate, color pigments, and plasticizing admixture. Use color pigments that are finely ground, nonfading mineral oxides interground with cement.

1. Manufacturers: Subject to compliance with requirements,:
 - a. Anti-Hydro International, Inc.
 - b. Butterfield Color, Inc.
 - c. Dynamic Color Solutions, Inc.
 - d. Euclid Chemical Company (The); a subsidiary of RPM International, Inc.
 - e. H&C Decorative Concrete Products; a brand of Sherwin-Williams Co.
 - f. Kaufman Products, Inc.
 - g. Lambert Corporation.
 - h. Master Builders Solutions; brand of MBCC Group.
 - i. Scofield, a Business Unit of Sika Corporation.
 - j. SpecChem, LLC.
2. Color: Grey.

2.6 CURING MATERIALS

- A. Evaporation Retarder: Waterborne, monomolecular film forming, manufactured for application to fresh concrete.

1. Manufacturers: Subject to compliance with requirements,:
 - a. Bon Tool Co.
 - b. Brickform; a division of Solomon Colors.
 - c. ChemMasters, Inc.
 - d. Dayton Superior Corporation.
 - e. Euclid Chemical Company (The); a subsidiary of RPM International, Inc.
 - f. Kaufman Products, Inc.
 - g. Lambert Corporation.
 - h. Laticrete International, Inc.
 - i. MAPEI Corporation.

- j. Master Builders Solutions; brand of MBCC Group.
 - k. Metalcrete Industries.
 - l. Nox-Crete Products Group.
 - m. Sika Corporation.
 - n. SINAK.
 - o. SpecChem, LLC.
 - p. TK Products Construction Coatings, a Fenix Group SPC Company.
 - q. Vexcon Chemicals Inc.
 - r. W. R. Meadows, Inc.

- B. Absorptive Cover: AASHTO M 182, Class 2, burlap cloth made from jute or kenaf, weighing approximately 9 oz./sq. yd. when dry.

- C. Water: Potable water that does not cause staining of the surface.

- D. Clear, Waterborne, Membrane-Forming, Dissipating Curing Compound: ASTM C309, Type 1, Class B.
 - 1. Manufacturers: Subject to compliance with requirements,:
 - a. Anti-Hydro International, Inc.
 - b. ChemMasters, Inc.
 - c. Dayton Superior Corporation.
 - d. Euclid Chemical Company (The); a subsidiary of RPM International, Inc.
 - e. Kaufman Products, Inc.
 - f. Lambert Corporation.
 - g. Laticrete International, Inc.
 - h. MAPEI Corporation.
 - i. Nox-Crete Products Group.
 - j. SpecChem, LLC.
 - k. TK Products Construction Coatings, a Fenix Group SPC Company.
 - l. Vexcon Chemicals Inc.
 - m. W. R. Meadows, Inc.

- E. Clear, Solvent-Borne, Membrane-Forming, Curing and Sealing Compound: ASTM C1315, Type 1, Class A.
 - 1. Manufacturers: Subject to compliance with requirements,:
 - a. ChemMasters, Inc.
 - b. Concrete Sealers USA.
 - c. Dayton Superior Corporation.
 - d. Euclid Chemical Company (The); a subsidiary of RPM International, Inc.
 - e. Kaufman Products, Inc.
 - f. Lambert Corporation.
 - g. Laticrete International, Inc.
 - h. MAPEI Corporation.
 - i. Master Builders Solutions; brand of MBCC Group.
 - j. Metalcrete Industries.
 - k. Nox-Crete Products Group.
 - l. PROSOCO, Inc.

- m. Right Pointe.
 - n. SpecChem, LLC.
 - o. TK Products Construction Coatings, a Fenix Group SPC Company.
 - p. Vexcon Chemicals Inc.
 - q. W. R. Meadows, Inc.
- 2. Products shall comply with the requirements of the Georgia Department of Public Health's "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers."
 - 3. Products shall comply with the requirements of the Georgia Department of Public Health's "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers." Formaldehyde emissions shall not exceed 16.5 mcg/cu. m or 13.5 ppb, whichever is less.
 - 4. Products shall comply with the requirements of the Georgia Department of Public Health's "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers."
- F. Clear, Waterborne, Membrane-Forming, Curing and Sealing Compound: ASTM C1315, Type 1, Class A.
- 1. Manufacturers: Subject to compliance with requirements,:
- a. ChemMasters, Inc.
 - b. Concrete Sealers USA.
 - c. Dayton Superior Corporation.
 - d. Euclid Chemical Company (The); a subsidiary of RPM International, Inc.
 - e. Kaufman Products, Inc.
 - f. Lambert Corporation.
 - g. Laticrete International, Inc.
 - h. MAPEI Corporation.
 - i. Metacrete Industries.
 - j. Nox-Crete Products Group.
 - k. Right Pointe.
 - l. SINAK.
 - m. SpecChem, LLC.
 - n. TK Products Construction Coatings, a Fenix Group SPC Company.
 - o. Vexcon Chemicals Inc.
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 - 4. Products shall comply with the requirements of the Georgia Department of Public Health's "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers."

2.7 ACCESSORIES

- A. Expansion- and Isolation-Joint-Filler Strips: ASTM D1751, asphalt-saturated cellulosic fiber or ASTM D1752, cork or self-expanding cork.
- B. Semirigid Joint Filler: Two-component, semirigid, 100 percent solids, aromatic polyurea with a Type A shore durometer hardness range of 90 to 95 in accordance with ASTM D2240.
- C. Bonding Agent: ASTM C1059/C1059M, Type II, nonredispersible, acrylic emulsion or styrene butadiene.
- D. Epoxy Bonding Adhesive: ASTM C881/C881M, two-component epoxy resin, capable of humid curing and bonding to damp surfaces, of class suitable for application temperature and of grade and class to suit requirements, and as follows:
 - 1. Types I and II, nonload bearing, for bonding hardened or freshly mixed concrete to hardened concrete.
- E. Floor Slab Protective Covering: 8 ft. wide cellulose fabric.
 - 1. Manufacturers: Subject to compliance with requirements,:
 - a. McTech Group, Inc.

2.8 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 C150/C150M portland cement or hydraulic or blended hydraulic cement, as defined in ASTM C219.
 - 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 4100 psi at 28 days when tested in accordance with ASTM C109/C109M.
- 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 C150/C150M portland cement or hydraulic or blended hydraulic cement, as defined in ASTM C219.
 - 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 in accordance with ASTM C109/C109M.

2.9 CONCRETE MIXTURE MATERIALS

- 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, in accordance with ACI 301.
 1. Use a qualified 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 or hydraulic cement in concrete assigned to Exposure Class F3 as follows:
 1. Fly Ash or Other Pozzolans: 25 percent by mass.
 2. Slag Cement: 50 percent by mass.
 3. Silica Fume: 10 percent by mass.
 4. Total of Fly Ash or Other Pozzolans, Slag Cement, and Silica Fume: 50 percent by mass, with fly ash or pozzolans not exceeding 25 percent by mass and silica fume not exceeding 10 percent by mass.
 5. Total of Fly Ash or Other Pozzolans and Silica Fume: 35 percent by mass with fly ash or pozzolans not exceeding 25 percent by mass and silica fume not exceeding 10 percent by mass.
- C. Admixtures: Use admixtures in accordance with manufacturer's written instructions.
 1. Use corrosion-inhibiting admixture in concrete mixtures where indicated.
 2. Use permeability-reducing admixture in concrete mixtures where indicated.
- D. Color Pigment: Add color pigment to concrete mixture in accordance with manufacturer's written instructions and to result in hardened concrete color consistent with approved mockup.

2.10 CONCRETE MIXTURE CLASS TYPES

- A. Class A: Normal-weight concrete used for footings, grade beams, and tie beams.
 1. Exposure Class: ACI 318 Class F1 Class S0 Class W0 Class C0.
 2. Minimum Compressive Strength: 4500 psi at 28 days.
 3. Maximum w/cm Ratio: 0.45.
 4. Slump Limit: 4 inches,.
 5. Slump Flow Limit: 22 inches, plus or minus 1-1/2 inches.
 6. Air Content:
 - a. Exposure Class F1: 5.0 percent, plus or minus 1.5 percent at point of delivery for concrete containing 3/4-inch nominal maximum aggregate size.
 7. Limit water-soluble, chloride-ion content in hardened concrete to 0.15percent by weight of cementitious materials.

8. Compressive strength or alternative methods of estimating in-place strength of concrete by maturity or other nondestructive testing with acceptable correlation between test results and concrete compressive strength 4000 psi at 28.

2.11 CONCRETE MIXING

- A. Ready-Mixed Concrete: Measure, batch, mix, and deliver concrete in accordance with ASTM C94/C94M and furnish delivery ticket.
- B. Project-Site Mixing: Measure, batch, and mix concrete materials and concrete in accordance with ASTM C94/C94M. Mix concrete materials in appropriate drum-type batch machine mixer.
 1. For mixer capacity of 1 cu. yd. or smaller, continue mixing at least 1-1/2 minutes, but not more than five minutes after ingredients are in mixer, before any part of batch is released.
 2. For mixer capacity larger than 1 cu. yd., increase mixing time by 15 seconds for each additional 1 cu. yd..
 3. Provide batch ticket for each batch discharged and used in the Work, indicating Project identification name and number, date, mixture type, mixture time, quantity, and amount of water added. Record approximate location of final deposit in structure.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verification of Conditions:
 1. Before placing concrete, verify that installation of concrete forms, accessories, 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 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 TOLERANCES

- A. Comply with ACI 117.

3.4 INSTALLATION OF EMBEDDED ITEMS

- A. Place and secure anchorage devices and other embedded items required for adjoining Work that is attached to or supported by cast-in-place concrete.
 - 1. Use setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.
 - 2. Install reglets to receive waterproofing and through-wall flashings in outer face of concrete frame at exterior walls, where flashing is shown at lintels, shelf angles, and other conditions.

3.5 INSTALLATION OF VAPOR RETARDERS

- 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. Terminate vapor retarder at the top of floor slabs, grade beams, and pile caps, sealing entire perimeter to floor slabs, grade beams, foundation walls, or pile caps.
 - 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.
- B. Bituminous Vapor Retarders: Place, protect, and repair bituminous vapor retarder in accordance with manufacturer's written instructions.

3.6 INSTALLATION OF CAST-IN-PLACE CONCRETE

- 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.
 - 2. Provide continuous inspection of vapor retarder during concrete placement and make necessary repairs to damaged areas as Work progresses.
- B. Notify Architect and testing and inspection agencies 24 hours prior to commencement of concrete placement.
- C. Water addition in transit or at the Project site must be in accordance with ASTM C94/C94M and must not exceed the permitted amount indicated on the concrete delivery ticket.

- 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 in accordance with 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. Do not place concrete floors and slabs in a checkerboard sequence.
 2. Consolidate concrete during placement operations, so concrete is thoroughly worked around reinforcement and other embedded items and into corners.
 3. Maintain reinforcement in position on chairs during concrete placement.
 4. Screed slab surfaces with a straightedge and strike off to correct elevations.
 5. Level concrete, cut high areas, and fill low areas.
 6. Slope surfaces uniformly to drains where required.
 7. Begin initial floating using bull floats or darbies to form a uniform and open-textured surface plane, before excess bleedwater appears on the surface.
 8. Do not further disturb slab surfaces before starting finishing operations.

3.7 INSTALLATION OF JOINTS

- A. Construct joints true to line, with faces perpendicular to surface plane of concrete.
- B. Construction Joints: Coordinate with floor slab pattern and concrete placement sequence.
1. Install so strength and appearance of concrete are not impaired, at locations indicated on Drawings or as approved by Architect.
 2. Place joints perpendicular to main reinforcement.
 - a. Continue reinforcement across construction joints unless otherwise indicated.
 3. Form keyed joints as indicated. Embed keys at least 1-1/2 inches into concrete.
 4. Locate joints for beams, slabs, joists, and girders at third points of spans. Offset joints in girders a minimum distance of twice the beam width from a beam-girder intersection.
 5. Locate horizontal joints in walls and columns at underside of floors, slabs, beams, and girders and at the top of footings or floor slabs.

6. Use a bonding agent at locations where fresh concrete is placed against hardened or partially hardened concrete surfaces.
 7. Use epoxy-bonding adhesive at locations where fresh concrete is placed against hardened or partially hardened concrete surfaces.
- C. Control Joints in Slabs-on-Ground: Form weakened-plane control joints, sectioning concrete into areas as indicated. Construct control joints for a depth equal to at least one-fourth of concrete thickness as follows:
1. Grooved Joints: Form control joints after initial floating by grooving and finishing each edge of joint to a radius of 1/8 inch. Repeat grooving of control joints after applying surface finishes. Eliminate groover tool marks on concrete surfaces.
 2. Sawed Joints: Form control 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 cracks.
- D. Isolation Joints in Slabs-on-Ground: 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 on Drawings.
 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.
- E. Doweled Joints:
1. Install dowel bars and support assemblies at joints where indicated on Drawings.
 2. Lubricate or asphalt coat one-half of dowel bar length to prevent concrete bonding to one side of joint.
- F. Dowel Plates: Install dowel plates at joints where indicated on Drawings.

3.8 APPLICATION OF FINISHING FLOORS AND SLABS

- A. Float Finish:
1. When bleedwater sheen has disappeared and concrete surface has stiffened sufficiently to permit operation of specific float apparatus, consolidate concrete surface with power-driven floats or by hand floating if area is small or inaccessible to power-driven floats.
 2. Repeat float passes and restraightening until surface is left with a uniform, smooth, granular texture and complies with ACI 117 tolerances for conventional concrete.
 3. Apply float finish to surfaces to receive trowel finish and to be covered with fluid-applied or sheet waterproofing.
 - a. Slabs on Ground:

- 1) Specified overall values of flatness, F_F 45; and of levelness, F_L 35; with minimum local values of flatness, F_F 30; and of levelness, F_L 24.
- B. Slip-Resistive Finish: Before final floating, apply slip-resistive aluminum granule finish to concrete stair treads, platforms, and ramps, as indicated on Drawings.
1. Apply in accordance with manufacturer's written instructions and as follows:
 - a. Uniformly spread 25 lb/100 sq. ft. dampened slip-resistive aggregate aluminum granules over surface in one or two applications.
 - b. Tamp aggregate flush with surface, but do not force below surface.
 - c. After broadcasting and tamping, apply float finish.
 - d. After curing, lightly work surface with a steel wire brush or an abrasive stone and water to expose slip-resistive aluminum granules.
- C. Dry-Shake Floor Hardener Finish: After initial floating, apply dry-shake floor hardener to surfaces in accordance with manufacturer's written instructions and as follows:
1. Uniformly apply dry-shake floor hardener at a rate of 100 lb/100 sq. ft. unless greater amount is recommended by manufacturer.
 2. Uniformly distribute approximately two-thirds of dry-shake floor hardener over surface by hand or with mechanical spreader, and embed by power floating.
 3. Follow power floating with a second dry-shake floor hardener application, uniformly distributing remainder of material, and embed by power floating.
 4. After final floating, apply a trowel finish.
 5. Cure concrete with curing compound recommended by dry-shake floor hardener manufacturer and apply immediately after final finishing.

3.9 APPLICATION OF FINISHING FORMED SURFACES

- A. Rubbed Finish: Apply the following to as-cast surface finishes where indicated on Drawings:
1. Smooth-Rubbed Finish:
 - a. Perform no later than one day after form removal.
 - b. Moisten concrete surfaces and rub with carborundum brick or another abrasive until producing a uniform color and texture.
 - c. If sufficient cement paste cannot be drawn from the concrete by the rubbing process, use a grout made from the same cementitious materials used in the in-place concrete.
 - d. Maintain required patterns or variances as shown on Drawings.
- B. INSTALLATION OF MISCELLANEOUS CONCRETE ITEMS
- C. Filling in:
1. Fill in holes and openings left in concrete structures after Work of other trades is in place unless otherwise indicated.

2. Mix, place, and cure concrete, as specified, to match color and texture with in-place construction exposed to view.
 3. Provide other miscellaneous concrete filling indicated or required to complete the Work.
- D. Curbs: Provide monolithic finish to interior curbs by stripping forms while concrete is still green and by troweling surfaces to a hard, dense finish with corners, intersections, and terminations slightly rounded.

3.10 CURING

- A. Protect freshly placed concrete from premature drying and excessive cold or hot temperatures.
1. Comply with ACI 301 for cold weather protection during curing.
 2. Comply with ACI 301 and ACI 305.1 for hot-weather protection during curing.
 3. Maintain moisture loss no more than 0.2 lb/sq. ft. x h, calculated in accordance with ACI 305R, before and during finishing operations.
- B. Curing Formed Surfaces: Comply with ACI 308.1 as follows:
1. Cure formed concrete surfaces, including underside of beams, supported slabs, and other similar surfaces.
 2. Cure concrete containing color pigments in accordance with color pigment manufacturer's instructions.
 3. If forms remain during curing period, moist cure after loosening forms.
 4. If removing forms before end of curing period, continue curing for remainder of curing period as follows:
 - a. Continuous Fogging: Maintain standing water on concrete surface until final setting of concrete.
 - b. Continuous Sprinkling: Maintain concrete surface continuously wet.
 - c. Absorptive Cover: Pre-dampen absorptive material before application; apply additional water to absorptive material to maintain concrete surface continuously wet.
 - d. Water-Retention Sheeting Materials: Cover exposed concrete surfaces with sheeting material, taping, or lapping seams.
 - e. Membrane-Forming Curing Compound: Apply uniformly in continuous operation by power spray or roller in accordance with manufacturer's written instructions.
 - 1) Recoat areas subject to heavy rainfall within three hours after initial application.
 - 2) Maintain continuity of coating and repair damage during curing period.
- C. Curing Unformed Surfaces: Comply with ACI 308.1 as follows:
1. Begin curing after finishing concrete.
 2. Interior Concrete Floors:
 - a. Floors to Receive Floor Coverings Specified in Other Sections: Contractor has option of the following:

- 1) Absorptive Cover: As soon as concrete has sufficient set to permit application without marring concrete surface, install prewetted absorptive cover over entire area of floor.
 - a) Lap edges and ends of absorptive cover not less than 12 inches.
 - b) Maintain absorptive cover water saturated, and in place, for duration of curing period, but not less than seven days.
 - 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.
 - a) Immediately repair any holes or tears during curing period, using cover material and waterproof tape.
 - b) Cure for not less than seven days.
- b. Floors to Receive Penetrating Liquid Floor Treatments: Contractor has option of the following:
- 1) Absorptive Cover: As soon as concrete has sufficient set to permit application without marring concrete surface, install prewetted absorptive cover over entire area of floor.
 - a) Lap edges and ends of absorptive cover not less than 12 inches.
 - b) Maintain absorptive cover water saturated, and in place, for duration of curing period, but not less than seven days.
 - 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.
 - a) Immediately repair any holes or tears during curing period, using cover material and waterproof tape.
 - b) Cure for not less than seven days.
 - 3) Ponding or Continuous Sprinkling of Water: Maintain concrete surfaces continuously wet for not less than seven days, utilizing one, or a combination of, the following:
 - a) Water.
 - b) Continuous water-fog spray.
- c. Floors To Receive Curing Compound:
- 1) Apply uniformly in continuous operation by power spray or roller in accordance with manufacturer's written instructions.
 - 2) Recoat areas subjected to heavy rainfall within three hours after initial application.
 - 3) Maintain continuity of coating, and repair damage during curing period.

- 4) Removal: After curing period has elapsed, remove curing compound without damaging concrete surfaces by method recommended by curing compound manufacturer.

d. Floors To Receive Curing and Sealing Compound:

- 1) Apply uniformly to floors and slabs indicated in a continuous operation by power spray or roller in accordance with manufacturer's written instructions.
- 2) Recoat areas subjected to heavy rainfall within three hours after initial application.
- 3) Repeat process 24 hours later, and apply a second coat. Maintain continuity of coating, and repair damage during curing period.

3.11 APPLICATION OF LIQUID FLOOR TREATMENTS

- A. Penetrating Liquid Floor Treatment: Prepare, apply, and finish penetrating liquid floor treatment in accordance with manufacturer's written instructions.
1. Remove curing compounds, sealers, oil, dirt, laitance, and other contaminants and complete surface repairs.
 2. Do not apply to concrete that is less than 28 days' old.
 3. Apply liquid until surface is saturated, scrubbing into surface until a gel forms; rewet; and repeat brooming or scrubbing.
 4. Rinse with water; remove excess material until surface is dry.
 5. Apply a second coat in a similar manner if surface has received a float finish or abrasive surface preparation.
- B. Sealing Coat: Uniformly apply a continuous sealing coat of curing and sealing compound to hardened concrete by power spray or roller in accordance with manufacturer's written instructions.

3.12 INSTALLATION OF JOINT FILLING

- A. Prepare, clean, and install joint filler in accordance with manufacturer's written instructions.
1. Defer joint filling until concrete has aged at least one month(s).
- B. Remove dirt, debris, saw cuttings, curing compounds, and sealers from joints; leave contact faces of joints clean and dry.
- C. Install semirigid joint filler full depth in saw-cut joints and at least 2 inches deep in formed joints.
- D. Overfill joint, and trim joint filler flush with top of joint after hardening.

3.13 INSTALLATION OF CONCRETE SURFACE REPAIRS

- A. Defective Concrete:

1. Repair and patch defective areas when approved by Architect.
 2. Remove and replace concrete that cannot be repaired and patched to meet specification requirements.
- B. Patching Mortar: Mix dry-pack patching mortar, consisting of 1 part portland cement to 2-1/2 parts fine aggregate passing a No. 16 sieve, using only enough water for handling and placing.
- C. Repairing Formed Surfaces: Surface defects include color and texture irregularities, cracks in excess of 0.01 inch spalls, air bubbles exceeding surface finish limits, honeycombs, rock pockets, fins and other projections on the surface exceeding surface finish limits, and stains and other discolorations that cannot be removed by cleaning.
1. Immediately after form removal, cut out honeycombs, rock pockets, and voids more than 1/2 inch in any dimension to solid concrete.
 - a. Limit cut depth to 3/4 inch.
 - b. Make edges of cuts perpendicular to concrete surface.
 - c. Clean, dampen with water, and brush-coat holes and voids with bonding agent.
 - d. Fill and compact with patching mortar before bonding agent has dried.
 - e. Fill form-tie voids with patching mortar or cone plugs secured in place with bonding agent.
 2. Repair defects on surfaces exposed to view by blending white portland cement and standard portland cement, so that, when dry, patching mortar matches surrounding color.
 - a. Patch a test area at inconspicuous locations to verify mixture and color match before proceeding with patching.
 - b. Compact mortar in place and match surrounding surface.
 3. Repair defects on concealed formed surfaces that will affect concrete's durability and structural performance, as determined by Architect.
- D. Repairing Unformed Surfaces:
1. Test unformed surfaces, such as floors and slabs, for finish, and verify surface tolerances specified for each surface.
 - a. Correct low and high areas.
 - b. Test surfaces sloped to drain for trueness of slope and smoothness; use a sloped template.
 2. Repair finished surfaces containing surface defects, including spalls, popouts, honeycombs, rock pockets, crazing, and cracks in excess of 0.01 inch wide or that penetrate to reinforcement or completely through unreinforced sections regardless of width.
 3. After concrete has cured at least 14 days, correct high areas by grinding.
 4. Correct localized low areas during, or immediately after, completing surface-finishing operations by adding patching mortar.
 - a. Finish repaired areas to blend into adjacent concrete.

5. Correct other low areas scheduled to receive floor coverings with a repair underlayment.
 - a. Prepare, mix, and apply repair underlayment and primer in accordance with manufacturer's written instructions to produce a smooth, uniform, plane, and level surface.
 - b. Feather edges to match adjacent floor elevations.
6. Correct other low areas scheduled to remain exposed with repair topping.
 - a. Cut out low areas to ensure a minimum repair topping depth of 1/4 inch to match adjacent floor elevations.
 - b. Prepare, mix, and apply repair topping and primer in accordance with manufacturer's written instructions to produce a smooth, uniform, plane, and level surface.
7. Repair defective areas, except random cracks and single holes 1 inch or less in diameter, by cutting out and replacing with fresh concrete.
 - a. Remove defective areas with clean, square cuts, and expose steel reinforcement with at least a 3/4-inch clearance all around.
 - b. Dampen concrete surfaces in contact with patching concrete and apply bonding agent.
 - c. Mix patching concrete of same materials and mixture as original concrete, except without coarse aggregate.
 - d. Place, compact, and finish to blend with adjacent finished concrete.
 - e. Cure in same manner as adjacent concrete.
8. Repair random cracks and single holes 1 inch or less in diameter with patching mortar.
 - a. Groove top of cracks and cut out holes to sound concrete, and clean off dust, dirt, and loose particles.
 - b. Dampen cleaned concrete surfaces and apply bonding agent.
 - c. Place patching mortar before bonding agent has dried.
 - d. Compact patching mortar and finish to match adjacent concrete.
 - e. Keep patched area continuously moist for at least 72 hours.
- E. Perform structural repairs of concrete, subject to Architect's approval, using epoxy adhesive and patching mortar.
- F. Repair materials and installation not specified above may be used, subject to Architect's approval.

3.14 FIELD QUALITY CONTROL

- A. Special Inspections: Owner will engage a special inspector to perform field tests and inspections and prepare testing and inspection reports.
- B. Testing Agency: Owner will engage a qualified testing and inspecting agency to perform tests and inspections and to submit reports.

1. Testing agency to be responsible for providing curing facility for initial curing of strength test specimens on-site and verifying that test specimens are cured in accordance with standard curing requirements in ASTM C31/C31M.
 2. Testing agency to immediately report to Architect, Contractor, and concrete manufacturer any failure of Work to comply with Contract Documents.
 3. Testing agency to report results of tests and inspections, in writing, to Owner, Architect, Contractor, and concrete manufacturer within 48 hours of inspections and tests.
 - a. Test reports to include reporting requirements of ASTM C31/C31M, , including the following as applicable to each test and inspection:
 - 1) Project name.
 - 2) Name of testing agency.
 - 3) Names and certification numbers of field and laboratory technicians performing inspections and testing.
 - 4) Name of concrete manufacturer.
 - 5) Date and time of inspection, sampling, and field testing.
 - 6) Date and time of concrete placement.
 - 7) Location in Work of concrete represented by samples.
 - 8) Date and time sample was obtained.
 - 9) Truck and batch ticket numbers.
 - 10) Design compressive strength at 28 days.
 - 11) Concrete mixture designation, proportions, and materials.
 - 12) Field test results of fresh concrete, including slump or slump flow, air content, temperature and density.
 - 13) Information on storage and curing of samples at the Project site, including curing method and maximum and minimum temperatures during initial curing period.
 - 14) Type of fracture and compressive break strengths at seven days and 28 days.
 4. Provide a space and source of power or other resources for curing and access to test specimens by the testing agency.
- C. Delivery Tickets: comply with ASTM C94/C94M.
- D. Inspections:
1. Headed bolts and studs.
 2. Verification of use of required design mixture.
 3. Concrete placement, including conveying and depositing.
 4. Curing procedures and maintenance of curing temperature.
 5. Verification of concrete strength before removal of shores and forms from beams and slabs.
 6. Batch Plant Inspections: On a random basis, as determined by Architect.
- E. Concrete Tests: Testing of composite samples of fresh concrete obtained in accordance with ASTM C 172/C 172M to be performed in accordance with 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 150 cu. yd. or fraction thereof.

- a. When frequency of testing provides fewer than five compressive-strength tests for each concrete mixture, testing is to be conducted from at least five randomly selected batches or from each batch if fewer than five are used.
2. Slump: ASTM C143/C143M:
 - a. One test at point of delivery for each composite sample, but not less than one test for each day's pour of each concrete mixture.
 - b. Perform additional tests as needed.
3. Slump Flow: ASTM C1611/C1611M:
 - a. One test at point of delivery for each composite sample when strength test specimens are cast, but not less than one test for each day's pour of each concrete mixture.
 - b. Perform additional tests as needed.
4. Air Content: ASTM C231/C231M pressure method, for normal-weight concrete;.
 - a. One test for each composite sample when strength test specimens are cast, but not less than one test for each day's pour of each concrete mixture.
5. Concrete Temperature: ASTM C1064/C1064M:
 - a. 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 when strength test specimens are cast.
6. Concrete Density: ASTM C138/C138M:
 - a. One test for each composite sample when strength test specimens are cast.
7. Unit Weight: ASTM C138/C138M density of fresh structural lightweight concrete.
 - a. One test for each composite sample, but not less than one test for each day's pour of each concrete mixture. The fresh density should be consistent with that associated with the equilibrium density within a tolerance of plus or minus 4 lb/ft.³.
8. Compression Test Specimens: ASTM C31/C31M:
 - a. Cast and standard cure two sets of three 6 inches by 12-inches or 4-inch by 8-inch cylindrical specimens for each composite sample.
 - b. Cast, and field cure sets of three standard cylindrical specimens for each composite sample.
9. Compressive-Strength Tests: ASTM C39/C39M.
 - a. Test one set of three r standard cured specimens at seven days and one set of two specimens at 28 other age days.
 - b. Test one set of three field-cured specimens at seven days and one set of two specimens at 28 days.
 - c. A compressive-strength test to be the average compressive strength from a set of two specimens obtained from same composite sample and tested at age indicated.

10. When strength of field-cured cylinders is less than 85 percent of companion laboratory-cured cylinders, Contractor to evaluate operations and provide corrective procedures for protecting and curing in-place concrete.
11. Strength of each concrete mixture will be satisfactory if every average of any three consecutive compressive-strength tests of standard cured cylinders equals or exceeds specified compressive strength, and no compressive-strength test value falls below specified compressive strength by more than 500 psi if specified compressive strength is 5000 psi, or no compressive strength test value is less than 10 percent of specified compressive strength if specified compressive strength is greater than 5000 psi.
12. 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.
13. Additional Tests:
 - a. Testing and inspecting agency to 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.
 - b. Testing and inspecting agency may conduct tests to determine adequacy of concrete by cored cylinders complying with ASTM C42/C42M or by other methods as directed by Architect.
 - 1) Acceptance criteria for concrete strength to be in accordance with ACI 301, Section 1.7.6.3.
14. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.
15. Correct deficiencies in the Work that test reports and inspections indicate do not comply with the Contract Documents.

F. Measure floor and slab flatness and levelness in accordance with ASTM E1155 within 48 hours of completion of floor finishing and promptly report test results to Architect.

3.15 PROTECTION

A. Protect concrete surfaces as follows:

1. Protect from petroleum stains.
2. Diaper hydraulic equipment used over concrete surfaces.
3. Prohibit vehicles from interior concrete slabs.
4. Prohibit use of pipe-cutting machinery over concrete surfaces.
5. Prohibit placement of steel items on concrete surfaces.
6. Prohibit use of acids or acidic detergents over concrete surfaces.
7. Protect liquid floor treatment from damage and wear during the remainder of construction period. Use protective methods and materials, including temporary covering, recommended in writing by liquid floor treatments installer.
8. Protect concrete surfaces scheduled to receive surface hardener or polished concrete finish using floor slab protective covering.

END OF SECTION

SECTION 116800 - PLAY FIELD EQUIPMENT AND STRUCTURES

1.1 RELATED DOCUMENTS

Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

This Section includes the following:

1. Freestanding playground equipment and structures.
2. Composite playground equipment and structures.

Related Sections include the following:

3. List below only products and construction that the reader might expect to find in this Section but are specified elsewhere. Delete first subparagraph below if concrete is specified in this Section. Division 03 Section "Cast-in-Place Concrete Miscellaneous Cast-in-Place Concrete" for concrete footings.
4. Division 32 Section "Playground Protective Surfacing" for protective surfacing under and around playground equipment.

1.3 DEFINITIONS

Fall Height: According to ASTM F 1487, "the vertical distance between a designated play surface and the protective surface beneath it."

- A. HDPE: High-density polyethylene.
- B. IPEMA: International Play Equipment Manufacturers Association.
- C. LLDPE: Linear low-density polyethylene.
- D. MDPE: Medium-density polyethylene.
- E. Use Zone: According to ASTM F 1487, "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."

1.4 ACTION SUBMITTALS

Product Data with Shop Drawings:

1. Product Data: For each type of product indicated.
2. Shop Drawings: Show fabrication and installation details for playground equipment and structures.

Retain first paragraph and subparagraphs below if Drawings do not include detailed plans or if Project involves unusual coordination requirements. Coordination Drawings: Plans drawn to scale, on which the following items are shown and coordinated with each other, based on input from installers of the items involved:

3. Extent of surface systems and use zones for equipment.

Samples for Initial Selection: For each type of playground equipment and structure indicated.

4. Manufacturer's color charts.
5. Include similar Samples of playground equipment and accessories involving color selection.

Delete paragraph and subparagraphs above if colors and other characteristics are preselected and specified or scheduled. Retain paragraphs and subparagraphs below with or without above. Samples for Verification: For each type of exposed finish required, prepared on Samples of size indicated below.

6. Posts and Rails: Not less than 6 inches long.
7. Platforms: Not less than 6 inches square.

1.5 INFORMATIONAL SUBMITTALS

Product Certificates: For each type of playground equipment, signed by product manufacturer.

- A. Retain paragraph below if "Installer Qualifications" Paragraph is retained in "Quality Assurance" Article. Installer Certificates: Signed by manufacturers certifying that installers comply with requirements.
- B. Coordinate first paragraph below with qualification requirements in Division 01 Section "Quality Requirements" and as supplemented in "Quality Assurance" Article. Qualification Data: For Installer manufacturer testing agency.
- C. Material Certificates: For the following items, signed by manufacturers:
 1. Adjust list below to suit Project.Shop finishes.

Retain paragraph below if Contractor is responsible for field quality-control testing. Field quality-control test reports.

- D. Retain first paragraph below if "Manufacturer Qualifications" or "Testing Agency Qualifications" Paragraph is retained in "Quality Assurance" Article. Product Test Reports: Based on evaluation of comprehensive tests performed by manufacturer and witnessed by a qualified testing agency, for playground equipment.
- E. Maintenance Data: For playground equipment and finishes to include in maintenance manuals.
- F. Warranty: Special warranty specified in this Section.

1.6 QUALITY ASSURANCE

Retain paragraph below if requiring playground equipment manufacturer to train and approve installers. Installer Qualifications: An employer of workers trained and approved by manufacturer.

- A. Retain paragraph below if Project requires playground equipment that is certified and labeled by an independent testing laboratory according to ASTM F 1487, excluding Sections 10 and 12.6.1. Not all manufacturers have products certified by IPEMA. Manufacturer Qualifications: A firm whose playground equipment components have been certified by IPEMA's third-party product certification service.
1. Retain subparagraph below for manufacturers that have all products tested and certified by IPEMA. Provide playground equipment and play structure components bearing the IPEMA Certification Seal.
 2. Provide the following playground equipment and play structure components bearing the IPEMA Certification Seal:

Testing Agency Qualifications: An independent agency qualified according to ANSI Z34.1 for testing indicated.

- B. Paragraph and subparagraph below may be retained to specify lumber and other wood products made from certified wood for LEED-NC Credit MR 7, which requires that a minimum of 50 percent of wood-based materials be certified. An alternative method of meeting Credit MR 7 requirement is to retain requirement in Division 01 Section "Sustainable Design Requirements" that gives Contractor option and responsibility for determining how Credit MR 7 requirement will be met. Usually retain paragraph and first subparagraph below to establish minimum requirements for safety for equipment unless compliance with other requirements is stipulated by authorities having jurisdiction. ASTM F 1487 contains technical requirements intended for use by manufacturers; CPSC No. 325 presents safety information for use by equipment purchasers and installers. If retaining both standards, conflicts may arise. Safety Standards: Provide playground equipment complying with or exceeding requirements in the following:

1. ASTM F 1487.
2. CPSC No. 325.

Delete paragraph below if Work of this Section is not extensive or complex enough to justify a preinstallation conference. If retaining, coordinate with Division 01. Preinstallation Conference: Conduct conference at Project site to comply with requirements in Division 01 Section "Project Management and Coordination."

1.7 WARRANTY

When warranties are required, verify with Owner's counsel that special warranties stated in this Article are not less than remedies available to Owner under prevailing local laws. Coordinate with Division 01 Section "Product Requirements." Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of playground equipment that fail in materials or workmanship within specified warranty period.

1. Failures include, but are not limited to, the following:
 - a. Structural failures.
 - b. Deterioration of metals, metal finishes, and other materials beyond normal weathering.
2. Verify available warranties for units and components and insert number in subparagraph below. Warranty Period: Five years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

See Editing Instruction No. 1 in the Evaluations for cautions about naming manufacturers and products. Edit this Article with other Part 2 articles in which manufacturers and products are named. See Division 01 Section "Product Requirements" for an explanation of the terms "Available Products," "Products," and "Basis-of-Design Product" and the effect these terms have on "Comparable Product" and "Product Substitution" requirements. In other Part 2 articles where titles below introduce lists, the following requirements apply to product selection:

1. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, products specified.
2. Products: Subject to compliance with requirements, provide one of the products specified.
3. Basis-of-Design Product: The design for each piece of playground equipment is based on the product named. Subject to compliance with requirements, provide either the named product or a comparable product by one of the other manufacturers specified.

2.2 MATERIALS

Aluminum: Alloy and temper recommended by manufacturer for type of use and finish indicated.

1. Extruded Bars, Profiles, and Tubes: ASTM B 221.
2. Cast Aluminum: ASTM B 179.
3. Flat Sheet: ASTM B 209.

Steel: Comply with the following:

4. Steel Plates, Shapes, and Bars: ASTM A 36/A 36M, hot-dip galvanized.
5. Steel Pipe: ASTM A 53/A 53M or ASTM A 135, standard-weight, hot-dip galvanized.
6. Steel Tubing: ASTM A 500 or ASTM A 513, cold formed, hot-dip galvanized.
7. Steel Sheet: ASTM A 1011/A 1011M, hot-dip galvanized.
8. Perforated Metal: Steel sheet not less than 0.0747-inch uncoated thickness; hot-dip galvanized, manufacturer's standard perforation pattern.
9. Expanded Metal: ASTM F 1267, Type II (expanded and flattened), Class 1, 2, 3/4 No. 13 manufacturer's standard carbon-steel sheets, hot-dip galvanized, deburred after expansion.
10. Woven Wire Mesh: Manufacturer's standard, with wire complying with ASTM A 510.
11. Recycled Content: Provide products with average recycled content of steel products such that postconsumer recycled content plus one-half of preconsumer recycled content is not less than 25 percent.

Stainless-Steel Sheet: ASTM A 240/A 240M or ASTM A 666; Type 304.

Chain in first paragraph below is commonly used for swing chain by most manufacturers and may be used for other components requiring chain. Revise paragraph if another chain is required for Project in addition to or in lieu of 4/0 or 5/0 straight-link Chain and Fittings: ASTM A 467/A 467M, Class CS, 4/0 or 5/0, welded-straight-link coil chain; hot-dip galvanized. With commercial-quality, hot-dip galvanized steel connectors and swing or ring hangers.

- B. Castings and Hangers: Malleable iron, ASTM A 47/A 47M, Grade 32510, hot dip galvanized.
- C. Post Caps: Cast aluminum or color-impregnated, UV-stabilized, mold-resistant polyethylene or polypropylene; color to match posts.

- D. Platform Clamps and Hangers: Cast aluminum or zinc-plated steel, not less than 0.105-inch- nominal thickness.
- E. Hardware: Manufacturer's standard; commercial-quality; corrosion-resistant; hot-dip galvanized steel and iron, stainless steel, or aluminum; of a secure and vandal-resistant design.
- F. Fasteners: Manufacturer's standard; corrosion-resistant; hot-dip galvanized or plated steel and iron, or stainless steel; permanently capped, and theft resistant.
- G. Softwood Plywood: DOC PS 1, exterior.
- H. Wood: Species indicated, free of heart center.
 - 1. Douglas fir.
 - 2. Pine.
 - 3. Western red cedar.
 - 4. Redwood.

2.3 WOOD-PRESERVATIVE-TREATED MATERIALS

Delete this Article if not applicable. See Evaluations for discussion of formulations and requirements for preservative treatment. Preservative Treatment: Pressure-treat wood according to AWPAC2 (lumber) and AWPAC9 (plywood) and the following.

- 1. Use preservative chemicals acceptable to authorities having jurisdiction and containing no arsenic or chromium. Use chemical formulations that do not bleed through or otherwise adversely affect finishes. Do not use colorants to distinguish treated materials from untreated materials.
- 2. Kiln-dry lumber and plywood after treatment to a maximum moisture content, respectively, of 19 and 15 percent. Do not use materials that are warped or do not comply with requirements for untreated materials.
- 3. Mark each treated item with treatment quality mark of an inspection agency approved by the American Lumber Standards Committee Board of Review.
- 4. Do not preservative treat redwood all-heart redwood Western red cedar all-heart western red cedar.

2.4 PLAYGROUND EQUIPMENT FABRICATION

Assemble items in the shop to greatest extent possible to minimize field splicing and assembly. Disassemble units only as necessary for shipping and handling limitations. Clearly mark units for reassembly and coordinated installation. Use connections that maintain structural value of joined pieces.

- A. Metal Frame: Fabricate main-frame upright support posts from metal pipe or tubing with cross-section profile and dimensions as indicated. Form metal to required shapes and sizes, true to line and level with true curves and accurate angles and surfaces. Finish exposed surfaces to smooth, sharp, well-defined lines and arris.
 - 1. Fabricate secondary frame members, bracing, and connections from either steel or aluminum. Unless otherwise indicated, provide each pipe or tubing main-frame member with manufacturer's standard drainable bottom plate or support flange.

2. Form simple and compound curves in bars and extruded shapes by bending members in jigs to produce uniform curvature for each configuration required; maintain cross section of member throughout entire bend without buckling, twisting, cracking, or otherwise deforming exposed surfaces.
3. Cut, drill, and punch metals cleanly and accurately. Remove sharp or rough areas on exposed surfaces.
4. Mill joints to a tight, hairline fit. Cope or miter corner joints. Fabricate connections that will be exposed to weather in a manner to exclude water.
5. Comply with AWS recommended practices for shop welding and brazing. Weld and braze behind finished surfaces without distorting or discoloring exposed side. Clean exposed welded and brazed joints of flux, and dress exposed and contact surfaces.
6. Provide weep holes where water may accumulate.

Provide necessary rebates, lugs, and brackets to assemble units and to attach to other work. Cut, reinforce, drill, and tap to receive finish hardware, screws, and similar items, unless otherwise indicated.

- B. Provide castings that are sound and free of warp, cracks, blowholes, or other defects that impair strength or appearance. Grind, wire brush, sandblast, and buff castings to remove seams, gate marks, casting flash, and other casting marks.
- C. If wood frame is required for Project, retain paragraph and subparagraph below. Retain paragraph below if main-frame supports are composite construction. Coordinate with applicable requirements in "Materials" Article. Composite Frame: Fabricate main-frame upright support posts from metal and plastic with profile and dimensions as indicated. Fabricate secondary frame members, bracing, and connections from either steel or aluminum.
- D. If retaining first paragraph below, indicate overall dimensions and configuration on Drawings. Units are available in a variety of shapes or as dimensioned planks for creating play surfaces in many configurations. Verify unit shapes and play-surface configurations with manufacturers of products specified. Play Surfaces: Provide manufacturer's standard elevated drainable decks, platforms, landings, walkways, ramps, and similar transitional play surfaces, designed to withstand loads; fabricated from perforated or expanded metal made into floor units with slip-slip-resistant foot surfaces. Fabricate units in manufacturer's standard modular sizes and shapes to form assembled play surfaces indicated.

2.5 FREESTANDING PLAYGROUND EQUIPMENT AND STRUCTURES

Revise this Article to suit Project. Paragraphs and subparagraphs below are examples of freestanding equipment and are not intended to be all-inclusive. Indicate individual equipment or assembled systems' dimensions and elevations on Drawings or in schedules. Copy and re-edit samples if more than one type is required, or use samples as guides for developing paragraphs and subparagraphs for other types of playground equipment. Delete this Article if concrete for footings is specified in Division 03. Concrete Materials and Properties: Comply with requirements in Division 03 Section "Cast-in-Place Concrete" ACI 301 to produce normal-weight, air-entrained concrete with a minimum 28-day compressive strength of 3000 psi, 3-inch slump, and 1-inch- maximum-size aggregate.

- A. Concrete Materials and Properties: Dry-packaged concrete mix complying with ASTM C 387 and mixed at site with potable water, according to manufacturer's written instructions, to produce normal-weight concrete with a minimum 28-day compressive strength of 3000 psi, 3-inch slump, and 1-inch- maximum-size aggregate.

2.6 FINISHES, GENERAL

Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.

- A. Appearance of Finished Work: Variations in appearance of abutting or adjacent pieces are acceptable if they are within one-half of the range of approved Samples. Noticeable variations in the same piece are not acceptable. Variations in appearance of other components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

2.7 ALUMINUM FINISHES

Baked-Enamel Finish: Prepare, treat, and coat metal to comply with paint manufacturer's written instructions and as follows:

1. Thermosetting, modified-acrylic enamel primer/topcoat system complying with AAMA 2603 except with a minimum dry film thickness not less than 1.5 mils 3 to 5 mils , medium gloss.

PVC Finish: Manufacturer's standard, UV-stabilized, mold-resistant, slip-resistant, matte-textured, dipped or sprayed-on, PVC-plastisol finish, with flame retardant added, complying with coating manufacturer's written instructions for pretreatment, application, and minimum dry film thickness of 80 mils 100 mils.

- B. Color: As indicated by manufacturer's designations.

2.8 IRON AND STEEL FINISHES

Galvanizing: Hot-dip galvanize products made from rolled-, pressed-, and forged-steel shapes, castings, plates, bars, and strips indicated to be galvanized to comply with ASTM A 123/A 123M.

1. Hot dip galvanized steel and iron hardware indicated to be galvanized to comply with ASTM A 153/A 153M.
2. Galvanized Steel Sheet: Commercial steel sheet, hot-dip galvanized, complying with ASTM A 653/A 653M for not less than G60 coating designation; mill phosphatized.

Powder-Coat Finish: Prepare, treat, and coat ferrous metal to comply with resin manufacturer's written instructions and as follows:

3. Apply thermosetting polyester or acrylic urethane powder coating with cured-film thickness not less than 1.5 mils.

Baked-Enamel Finish: Immediately after cleaning and pretreating, apply manufacturer's standard two-coat, baked-enamel finish consisting of prime coat and thermosetting topcoat. Comply with paint manufacturer's written instructions for applying and baking to achieve a minimum dry film thickness of 2 mils.

- B. PVC Finish: Manufacturer's standard, UV-stabilized, mold-resistant, slip-resistant, matte-textured, dipped or sprayed-on, PVC-plastisol finish, with flame retardant added, complying with coating manufacturer's written instructions for pretreatment, application, and minimum dry film thickness of 80 mils 100 mils.

- C. Color: As indicated by manufacturer's designations Match Architect's sample As selected by Architect from manufacturer's full range.

2.9 STAINLESS-STEEL FINISHES

Remove tool and die marks and stretch lines or blend into finish.

- A. Finished in paragraph below is a rolled finish applied to metal sheet before fabrication. Rolled finishes require care during fabrication to avoid damage. Bright, Cold-Rolled, Unpolished Finish: No. 2B finish on exposed faces.

PART 3 - EXECUTION

3.1 EXAMINATION

Examine areas and conditions, with Installer present, for compliance with requirements for site clearing, earthwork, site surface and subgrade 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 Architect.
2. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

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

3.3 INSTALLATION, GENERAL

General: Comply with manufacturer's written installation instructions, unless more stringent requirements are indicated. Anchor playground equipment securely, positioned at locations and elevations indicated.

1. Maximum Equipment Height: Coordinate installed heights of equipment and components with finished elevations 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.

Post and Footing Excavation: Excavate holes for posts and footings as indicated in firm, undisturbed or compacted subgrade soil.

- B. Retain paragraph below for playground equipment set without concrete or delete if playground equipment is attached to a supporting structure that does not require support by concrete footings. Retain paragraphs and subparagraphs below if playground equipment is set with concrete footings. Most playground equipment requires concrete footings. Post Set with Concrete Footing: Comply with ACI 301 for measuring, batching, mixing, transporting, forming, and placing concrete.

1. Set equipment posts in concrete footing. Protect portion of posts above footing from concrete splatter. Verify that posts are set plumb or at the correct angle, alignment, height, and spacing.

- a. Place concrete around posts and vibrate or tamp for consolidation. Hold posts in position during placement and finishing operations until concrete is sufficiently cured.
2. Embedded Items: Use setting drawings and manufacturer's written instructions to ensure correct installation of anchorages for equipment.
3. Concrete Footings: Smooth top, and shape to shed water.

3.4 FIELD QUALITY CONTROL

Retain first option in paragraph below if Owner engages agency; retain second option if Contractor engages agency. If retaining second option, retain requirement for field quality-control test reports in Part 1 "Submittals" Article. Testing Agency: Owner will engage a qualified independent testing and inspecting agency to perform field tests and inspections and prepare test reports.

- A. Verify availability and terms of inspection for technical representation with manufacturers of specified equipment at Project site. Revise source of report to a qualified playground consultant or certified National Recreation and Park Association/National Playground Safety Institute playground safety inspector if required. See Evaluations. Arrange for playground equipment manufacturer's technical personnel to inspect playground and playground equipment and components during installation and at final completion and to certify compliance with the following:
 1. ASTM F 1487.
 2. CPSC No. 325.

Retain paragraph below if Architect or Owner wants to be present during final inspection. Notify Architect Owner 48 hours in advance of date and time of final inspection.

END OF SECTION

SECTION 116800 - PLAY FIELD EQUIPMENT AND STRUCTURES

1.1 RELATED DOCUMENTS

Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

This Section includes the following:

1. Freestanding playground equipment and structures.
2. Composite playground equipment and structures.

Related Sections include the following:

3. List below only products and construction that the reader might expect to find in this Section but are specified elsewhere. Delete first subparagraph below if concrete is specified in this Section. Division 03 Section "Cast-in-Place Concrete Miscellaneous Cast-in-Place Concrete" for concrete footings.
4. Division 32 Section "Playground Protective Surfacing" for protective surfacing under and around playground equipment.

1.3 DEFINITIONS

Fall Height: According to ASTM F 1487, "the vertical distance between a designated play surface and the protective surface beneath it."

- A. HDPE: High-density polyethylene.
- B. IPEMA: International Play Equipment Manufacturers Association.
- C. LLDPE: Linear low-density polyethylene.
- D. MDPE: Medium-density polyethylene.
- E. Use Zone: According to ASTM F 1487, "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."

1.4 ACTION SUBMITTALS

Product Data with Shop Drawings:

1. Product Data: For each type of product indicated.
2. Shop Drawings: Show fabrication and installation details for playground equipment and structures.

Retain first paragraph and subparagraphs below if Drawings do not include detailed plans or if Project involves unusual coordination requirements. Coordination Drawings: Plans drawn to scale, on which the following items are shown and coordinated with each other, based on input from installers of the items involved:

3. Extent of surface systems and use zones for equipment.

Samples for Initial Selection: For each type of playground equipment and structure indicated.

4. Manufacturer's color charts.
5. Include similar Samples of playground equipment and accessories involving color selection.

Delete paragraph and subparagraphs above if colors and other characteristics are preselected and specified or scheduled. Retain paragraphs and subparagraphs below with or without above. Samples for Verification: For each type of exposed finish required, prepared on Samples of size indicated below.

6. Posts and Rails: Not less than 6 inches long.
7. Platforms: Not less than 6 inches square.

1.5 INFORMATIONAL SUBMITTALS

Product Certificates: For each type of playground equipment, signed by product manufacturer.

- A. Retain paragraph below if "Installer Qualifications" Paragraph is retained in "Quality Assurance" Article. Installer Certificates: Signed by manufacturers certifying that installers comply with requirements.
- B. Coordinate first paragraph below with qualification requirements in Division 01 Section "Quality Requirements" and as supplemented in "Quality Assurance" Article. Qualification Data: For Installer manufacturer testing agency.
- C. Material Certificates: For the following items, signed by manufacturers:
 1. Adjust list below to suit Project.Shop finishes.

Retain paragraph below if Contractor is responsible for field quality-control testing. Field quality-control test reports.

- D. Retain first paragraph below if "Manufacturer Qualifications" or "Testing Agency Qualifications" Paragraph is retained in "Quality Assurance" Article. Product Test Reports: Based on evaluation of comprehensive tests performed by manufacturer and witnessed by a qualified testing agency, for playground equipment.
- E. Maintenance Data: For playground equipment and finishes to include in maintenance manuals.
- F. Warranty: Special warranty specified in this Section.

1.6 QUALITY ASSURANCE

Retain paragraph below if requiring playground equipment manufacturer to train and approve installers. Installer Qualifications: An employer of workers trained and approved by manufacturer.

- A. Retain paragraph below if Project requires playground equipment that is certified and labeled by an independent testing laboratory according to ASTM F 1487, excluding Sections 10 and 12.6.1. Not all manufacturers have products certified by IPEMA. Manufacturer Qualifications: A firm whose playground equipment components have been certified by IPEMA's third-party product certification service.
1. Retain subparagraph below for manufacturers that have all products tested and certified by IPEMA. Provide playground equipment and play structure components bearing the IPEMA Certification Seal.
 2. Provide the following playground equipment and play structure components bearing the IPEMA Certification Seal:

Testing Agency Qualifications: An independent agency qualified according to ANSI Z34.1 for testing indicated.

- B. Paragraph and subparagraph below may be retained to specify lumber and other wood products made from certified wood for LEED-NC Credit MR 7, which requires that a minimum of 50 percent of wood-based materials be certified. An alternative method of meeting Credit MR 7 requirement is to retain requirement in Division 01 Section "Sustainable Design Requirements" that gives Contractor option and responsibility for determining how Credit MR 7 requirement will be met. Usually retain paragraph and first subparagraph below to establish minimum requirements for safety for equipment unless compliance with other requirements is stipulated by authorities having jurisdiction. ASTM F 1487 contains technical requirements intended for use by manufacturers; CPSC No. 325 presents safety information for use by equipment purchasers and installers. If retaining both standards, conflicts may arise. Safety Standards: Provide playground equipment complying with or exceeding requirements in the following:

1. ASTM F 1487.
2. CPSC No. 325.

Delete paragraph below if Work of this Section is not extensive or complex enough to justify a preinstallation conference. If retaining, coordinate with Division 01. Preinstallation Conference: Conduct conference at Project site to comply with requirements in Division 01 Section "Project Management and Coordination."

1.7 WARRANTY

When warranties are required, verify with Owner's counsel that special warranties stated in this Article are not less than remedies available to Owner under prevailing local laws. Coordinate with Division 01 Section "Product Requirements." Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of playground equipment that fail in materials or workmanship within specified warranty period.

1. Failures include, but are not limited to, the following:
 - a. Structural failures.
 - b. Deterioration of metals, metal finishes, and other materials beyond normal weathering.
2. Verify available warranties for units and components and insert number in subparagraph below. Warranty Period: Five years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

See Editing Instruction No. 1 in the Evaluations for cautions about naming manufacturers and products. Edit this Article with other Part 2 articles in which manufacturers and products are named. See Division 01 Section "Product Requirements" for an explanation of the terms "Available Products," "Products," and "Basis-of-Design Product" and the effect these terms have on "Comparable Product" and "Product Substitution" requirements. In other Part 2 articles where titles below introduce lists, the following requirements apply to product selection:

1. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, products specified.
2. Products: Subject to compliance with requirements, provide one of the products specified.
3. Basis-of-Design Product: The design for each piece of playground equipment is based on the product named. Subject to compliance with requirements, provide either the named product or a comparable product by one of the other manufacturers specified.

2.2 MATERIALS

Aluminum: Alloy and temper recommended by manufacturer for type of use and finish indicated.

1. Extruded Bars, Profiles, and Tubes: ASTM B 221.
2. Cast Aluminum: ASTM B 179.
3. Flat Sheet: ASTM B 209.

Steel: Comply with the following:

4. Steel Plates, Shapes, and Bars: ASTM A 36/A 36M, hot-dip galvanized.
5. Steel Pipe: ASTM A 53/A 53M or ASTM A 135, standard-weight, hot-dip galvanized.
6. Steel Tubing: ASTM A 500 or ASTM A 513, cold formed, hot-dip galvanized.
7. Steel Sheet: ASTM A 1011/A 1011M, hot-dip galvanized.
8. Perforated Metal: Steel sheet not less than 0.0747-inch uncoated thickness; hot-dip galvanized, manufacturer's standard perforation pattern.
9. Expanded Metal: ASTM F 1267, Type II (expanded and flattened), Class 1, 2, 3/4 No. 13 manufacturer's standard carbon-steel sheets, hot-dip galvanized, deburred after expansion.
10. Woven Wire Mesh: Manufacturer's standard, with wire complying with ASTM A 510.
11. Recycled Content: Provide products with average recycled content of steel products such that postconsumer recycled content plus one-half of preconsumer recycled content is not less than 25 percent.

Stainless-Steel Sheet: ASTM A 240/A 240M or ASTM A 666; Type 304.

Chain in first paragraph below is commonly used for swing chain by most manufacturers and may be used for other components requiring chain. Revise paragraph if another chain is required for Project in addition to or in lieu of 4/0 or 5/0 straight-link Chain and Fittings: ASTM A 467/A 467M, Class CS, 4/0 or 5/0, welded-straight-link coil chain; hot-dip galvanized. With commercial-quality, hot-dip galvanized steel connectors and swing or ring hangers.

- B. Castings and Hangers: Malleable iron, ASTM A 47/A 47M, Grade 32510, hot dip galvanized.
- C. Post Caps: Cast aluminum or color-impregnated, UV-stabilized, mold-resistant polyethylene or polypropylene; color to match posts.

- D. Platform Clamps and Hangers: Cast aluminum or zinc-plated steel, not less than 0.105-inch- nominal thickness.
- E. Hardware: Manufacturer's standard; commercial-quality; corrosion-resistant; hot-dip galvanized steel and iron, stainless steel, or aluminum; of a secure and vandal-resistant design.
- F. Fasteners: Manufacturer's standard; corrosion-resistant; hot-dip galvanized or plated steel and iron, or stainless steel; permanently capped, and theft resistant.
- G. Softwood Plywood: DOC PS 1, exterior.
- H. Wood: Species indicated, free of heart center.
 - 1. Douglas fir.
 - 2. Pine.
 - 3. Western red cedar.
 - 4. Redwood.

2.3 WOOD-PRESERVATIVE-TREATED MATERIALS

Delete this Article if not applicable. See Evaluations for discussion of formulations and requirements for preservative treatment. Preservative Treatment: Pressure-treat wood according to AWPAC2 (lumber) and AWPAC9 (plywood) and the following.

- 1. Use preservative chemicals acceptable to authorities having jurisdiction and containing no arsenic or chromium. Use chemical formulations that do not bleed through or otherwise adversely affect finishes. Do not use colorants to distinguish treated materials from untreated materials.
- 2. Kiln-dry lumber and plywood after treatment to a maximum moisture content, respectively, of 19 and 15 percent. Do not use materials that are warped or do not comply with requirements for untreated materials.
- 3. Mark each treated item with treatment quality mark of an inspection agency approved by the American Lumber Standards Committee Board of Review.
- 4. Do not preservative treat redwood all-heart redwood Western red cedar all-heart western red cedar.

2.4 PLAYGROUND EQUIPMENT FABRICATION

Assemble items in the shop to greatest extent possible to minimize field splicing and assembly. Disassemble units only as necessary for shipping and handling limitations. Clearly mark units for reassembly and coordinated installation. Use connections that maintain structural value of joined pieces.

- A. Metal Frame: Fabricate main-frame upright support posts from metal pipe or tubing with cross-section profile and dimensions as indicated. Form metal to required shapes and sizes, true to line and level with true curves and accurate angles and surfaces. Finish exposed surfaces to smooth, sharp, well-defined lines and arris.
 - 1. Fabricate secondary frame members, bracing, and connections from either steel or aluminum. Unless otherwise indicated, provide each pipe or tubing main-frame member with manufacturer's standard drainable bottom plate or support flange.

2. Form simple and compound curves in bars and extruded shapes by bending members in jigs to produce uniform curvature for each configuration required; maintain cross section of member throughout entire bend without buckling, twisting, cracking, or otherwise deforming exposed surfaces.
3. Cut, drill, and punch metals cleanly and accurately. Remove sharp or rough areas on exposed surfaces.
4. Mill joints to a tight, hairline fit. Cope or miter corner joints. Fabricate connections that will be exposed to weather in a manner to exclude water.
5. Comply with AWS recommended practices for shop welding and brazing. Weld and braze behind finished surfaces without distorting or discoloring exposed side. Clean exposed welded and brazed joints of flux, and dress exposed and contact surfaces.
6. Provide weep holes where water may accumulate.

Provide necessary rebates, lugs, and brackets to assemble units and to attach to other work. Cut, reinforce, drill, and tap to receive finish hardware, screws, and similar items, unless otherwise indicated.

- B. Provide castings that are sound and free of warp, cracks, blowholes, or other defects that impair strength or appearance. Grind, wire brush, sandblast, and buff castings to remove seams, gate marks, casting flash, and other casting marks.
- C. If wood frame is required for Project, retain paragraph and subparagraph below. Retain paragraph below if main-frame supports are composite construction. Coordinate with applicable requirements in "Materials" Article. Composite Frame: Fabricate main-frame upright support posts from metal and plastic with profile and dimensions as indicated. Fabricate secondary frame members, bracing, and connections from either steel or aluminum.
- D. If retaining first paragraph below, indicate overall dimensions and configuration on Drawings. Units are available in a variety of shapes or as dimensioned planks for creating play surfaces in many configurations. Verify unit shapes and play-surface configurations with manufacturers of products specified. Play Surfaces: Provide manufacturer's standard elevated drainable decks, platforms, landings, walkways, ramps, and similar transitional play surfaces, designed to withstand loads; fabricated from perforated or expanded metal made into floor units with slip-slip-resistant foot surfaces. Fabricate units in manufacturer's standard modular sizes and shapes to form assembled play surfaces indicated.

2.5 FREESTANDING PLAYGROUND EQUIPMENT AND STRUCTURES

Revise this Article to suit Project. Paragraphs and subparagraphs below are examples of freestanding equipment and are not intended to be all-inclusive. Indicate individual equipment or assembled systems' dimensions and elevations on Drawings or in schedules. Copy and re-edit samples if more than one type is required, or use samples as guides for developing paragraphs and subparagraphs for other types of playground equipment. Delete this Article if concrete for footings is specified in Division 03. Concrete Materials and Properties: Comply with requirements in Division 03 Section "Cast-in-Place Concrete" ACI 301 to produce normal-weight, air-entrained concrete with a minimum 28-day compressive strength of 3000 psi, 3-inch slump, and 1-inch- maximum-size aggregate.

- A. Concrete Materials and Properties: Dry-packaged concrete mix complying with ASTM C 387 and mixed at site with potable water, according to manufacturer's written instructions, to produce normal-weight concrete with a minimum 28-day compressive strength of 3000 psi, 3-inch slump, and 1-inch- maximum-size aggregate.

2.6 FINISHES, GENERAL

Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.

- A. Appearance of Finished Work: Variations in appearance of abutting or adjacent pieces are acceptable if they are within one-half of the range of approved Samples. Noticeable variations in the same piece are not acceptable. Variations in appearance of other components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

2.7 ALUMINUM FINISHES

Baked-Enamel Finish: Prepare, treat, and coat metal to comply with paint manufacturer's written instructions and as follows:

- 1. Thermosetting, modified-acrylic enamel primer/topcoat system complying with AAMA 2603 except with a minimum dry film thickness not less than 1.5 mils 3 to 5 mils medium gloss.

PVC Finish: Manufacturer's standard, UV-stabilized, mold-resistant, slip-resistant, matte-textured, dipped or sprayed-on, PVC-plastisol finish, with flame retardant added, complying with coating manufacturer's written instructions for pretreatment, application, and minimum dry film thickness of 80 mils 100 mils.

- B. Color: As indicated by manufacturer's designations.

2.8 IRON AND STEEL FINISHES

Galvanizing: Hot-dip galvanize products made from rolled-, pressed-, and forged-steel shapes, castings, plates, bars, and strips indicated to be galvanized to comply with ASTM A 123/A 123M.

- 1. Hot dip galvanized steel and iron hardware indicated to be galvanized to comply with ASTM A 153/A 153M.
- 2. Galvanized Steel Sheet: Commercial steel sheet, hot-dip galvanized, complying with ASTM A 653/A 653M for not less than G60 coating designation; mill phosphatized.

Powder-Coat Finish: Prepare, treat, and coat ferrous metal to comply with resin manufacturer's written instructions and as follows:

- 3. Apply thermosetting polyester or acrylic urethane powder coating with cured-film thickness not less than 1.5 mils.

Baked-Enamel Finish: Immediately after cleaning and pretreating, apply manufacturer's standard two-coat, baked-enamel finish consisting of prime coat and thermosetting topcoat. Comply with paint manufacturer's written instructions for applying and baking to achieve a minimum dry film thickness of 2 mils.

- B. PVC Finish: Manufacturer's standard, UV-stabilized, mold-resistant, slip-resistant, matte-textured, dipped or sprayed-on, PVC-plastisol finish, with flame retardant added, complying with coating manufacturer's written instructions for pretreatment, application, and minimum dry film thickness of 80 mils 100 mils.

- C. Color: As indicated by manufacturer's designations Match Architect's sample As selected by Architect from manufacturer's full range.

2.9 STAINLESS-STEEL FINISHES

Remove tool and die marks and stretch lines or blend into finish.

- A. Finished in paragraph below is a rolled finish applied to metal sheet before fabrication. Rolled finishes require care during fabrication to avoid damage. Bright, Cold-Rolled, Unpolished Finish: No. 2B finish on exposed faces.

PART 3 - EXECUTION

3.1 EXAMINATION

Examine areas and conditions, with Installer present, for compliance with requirements for site clearing, earthwork, site surface and subgrade 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 Architect.
2. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

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

3.3 INSTALLATION, GENERAL

General: Comply with manufacturer's written installation instructions, unless more stringent requirements are indicated. Anchor playground equipment securely, positioned at locations and elevations indicated.

1. Maximum Equipment Height: Coordinate installed heights of equipment and components with finished elevations 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.

Post and Footing Excavation: Excavate holes for posts and footings as indicated in firm, undisturbed or compacted subgrade soil.

- B. Retain paragraph below for playground equipment set without concrete or delete if playground equipment is attached to a supporting structure that does not require support by concrete footings. Retain paragraphs and subparagraphs below if playground equipment is set with concrete footings. Most playground equipment requires concrete footings. Post Set with Concrete Footing: Comply with ACI 301 for measuring, batching, mixing, transporting, forming, and placing concrete.

1. Set equipment posts in concrete footing. Protect portion of posts above footing from concrete splatter. Verify that posts are set plumb or at the correct angle, alignment, height, and spacing.

- a. Place concrete around posts and vibrate or tamp for consolidation. Hold posts in position during placement and finishing operations until concrete is sufficiently cured.
2. Embedded Items: Use setting drawings and manufacturer's written instructions to ensure correct installation of anchorages for equipment.
3. Concrete Footings: Smooth top, and shape to shed water.

3.4 FIELD QUALITY CONTROL

Retain first option in paragraph below if Owner engages agency; retain second option if Contractor engages agency. If retaining second option, retain requirement for field quality-control test reports in Part 1 "Submittals" Article. Testing Agency: Owner will engage a qualified independent testing and inspecting agency to perform field tests and inspections and prepare test reports.

- A. Verify availability and terms of inspection for technical representation with manufacturers of specified equipment at Project site. Revise source of report to a qualified playground consultant or certified National Recreation and Park Association/National Playground Safety Institute playground safety inspector if required. See Evaluations. Arrange for playground equipment manufacturer's technical personnel to inspect playground and playground equipment and components during installation and at final completion and to certify compliance with the following:
 1. ASTM F 1487.
 2. CPSC No. 325.

Retain paragraph below if Architect or Owner wants to be present during final inspection. Notify Architect Owner 48 hours in advance of date and time of final inspection.

END OF SECTION

SECTION 116800 - PLAY FIELD EQUIPMENT AND STRUCTURES

1.1 RELATED DOCUMENTS

Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

This Section includes the following:

1. Freestanding playground equipment and structures.
2. Composite playground equipment and structures.

Related Sections include the following:

3. List below only products and construction that the reader might expect to find in this Section but are specified elsewhere. Delete first subparagraph below if concrete is specified in this Section. Division 03 Section "Cast-in-Place Concrete Miscellaneous Cast-in-Place Concrete" for concrete footings.
4. Division 32 Section "Playground Protective Surfacing" for protective surfacing under and around playground equipment.

1.3 DEFINITIONS

Fall Height: According to ASTM F 1487, "the vertical distance between a designated play surface and the protective surface beneath it."

- A. HDPE: High-density polyethylene.
- B. IPEMA: International Play Equipment Manufacturers Association.
- C. LLDPE: Linear low-density polyethylene.
- D. MDPE: Medium-density polyethylene.
- E. Use Zone: According to ASTM F 1487, "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."

1.4 ACTION SUBMITTALS

Product Data with Shop Drawings:

1. Product Data: For each type of product indicated.
2. Shop Drawings: Show fabrication and installation details for playground equipment and structures.

Retain first paragraph and subparagraphs below if Drawings do not include detailed plans or if Project involves unusual coordination requirements. Coordination Drawings: Plans drawn to scale, on which the following items are shown and coordinated with each other, based on input from installers of the items involved:

3. Extent of surface systems and use zones for equipment.

Samples for Initial Selection: For each type of playground equipment and structure indicated.

4. Manufacturer's color charts.
5. Include similar Samples of playground equipment and accessories involving color selection.

Delete paragraph and subparagraphs above if colors and other characteristics are preselected and specified or scheduled. Retain paragraphs and subparagraphs below with or without above. Samples for Verification: For each type of exposed finish required, prepared on Samples of size indicated below.

6. Posts and Rails: Not less than 6 inches long.
7. Platforms: Not less than 6 inches square.

1.5 INFORMATIONAL SUBMITTALS

Product Certificates: For each type of playground equipment, signed by product manufacturer.

- A. Retain paragraph below if "Installer Qualifications" Paragraph is retained in "Quality Assurance" Article. Installer Certificates: Signed by manufacturers certifying that installers comply with requirements.
- B. Coordinate first paragraph below with qualification requirements in Division 01 Section "Quality Requirements" and as supplemented in "Quality Assurance" Article. Qualification Data: For Installer manufacturer testing agency.
- C. Material Certificates: For the following items, signed by manufacturers:
 1. Adjust list below to suit Project.Shop finishes.

Retain paragraph below if Contractor is responsible for field quality-control testing. Field quality-control test reports.

- D. Retain first paragraph below if "Manufacturer Qualifications" or "Testing Agency Qualifications" Paragraph is retained in "Quality Assurance" Article. Product Test Reports: Based on evaluation of comprehensive tests performed by manufacturer and witnessed by a qualified testing agency, for playground equipment.
- E. Maintenance Data: For playground equipment and finishes to include in maintenance manuals.
- F. Warranty: Special warranty specified in this Section.

1.6 QUALITY ASSURANCE

Retain paragraph below if requiring playground equipment manufacturer to train and approve installers. Installer Qualifications: An employer of workers trained and approved by manufacturer.

- A. Retain paragraph below if Project requires playground equipment that is certified and labeled by an independent testing laboratory according to ASTM F 1487, excluding Sections 10 and 12.6.1. Not all manufacturers have products certified by IPEMA. Manufacturer Qualifications: A firm whose playground equipment components have been certified by IPEMA's third-party product certification service.
1. Retain subparagraph below for manufacturers that have all products tested and certified by IPEMA. Provide playground equipment and play structure components bearing the IPEMA Certification Seal.
 2. Provide the following playground equipment and play structure components bearing the IPEMA Certification Seal:

Testing Agency Qualifications: An independent agency qualified according to ANSI Z34.1 for testing indicated.

- B. Paragraph and subparagraph below may be retained to specify lumber and other wood products made from certified wood for LEED-NC Credit MR 7, which requires that a minimum of 50 percent of wood-based materials be certified. An alternative method of meeting Credit MR 7 requirement is to retain requirement in Division 01 Section "Sustainable Design Requirements" that gives Contractor option and responsibility for determining how Credit MR 7 requirement will be met. Usually retain paragraph and first subparagraph below to establish minimum requirements for safety for equipment unless compliance with other requirements is stipulated by authorities having jurisdiction. ASTM F 1487 contains technical requirements intended for use by manufacturers; CPSC No. 325 presents safety information for use by equipment purchasers and installers. If retaining both standards, conflicts may arise. Safety Standards: Provide playground equipment complying with or exceeding requirements in the following:

1. ASTM F 1487.
2. CPSC No. 325.

Delete paragraph below if Work of this Section is not extensive or complex enough to justify a preinstallation conference. If retaining, coordinate with Division 01. Preinstallation Conference: Conduct conference at Project site to comply with requirements in Division 01 Section "Project Management and Coordination."

1.7 WARRANTY

When warranties are required, verify with Owner's counsel that special warranties stated in this Article are not less than remedies available to Owner under prevailing local laws. Coordinate with Division 01 Section "Product Requirements." Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of playground equipment that fail in materials or workmanship within specified warranty period.

1. Failures include, but are not limited to, the following:
 - a. Structural failures.
 - b. Deterioration of metals, metal finishes, and other materials beyond normal weathering.
2. Verify available warranties for units and components and insert number in subparagraph below. Warranty Period: Five years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

See Editing Instruction No. 1 in the Evaluations for cautions about naming manufacturers and products. Edit this Article with other Part 2 articles in which manufacturers and products are named. See Division 01 Section "Product Requirements" for an explanation of the terms "Available Products," "Products," and "Basis-of-Design Product" and the effect these terms have on "Comparable Product" and "Product Substitution" requirements. In other Part 2 articles where titles below introduce lists, the following requirements apply to product selection:

1. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, products specified.
2. Products: Subject to compliance with requirements, provide one of the products specified.
3. Basis-of-Design Product: The design for each piece of playground equipment is based on the product named. Subject to compliance with requirements, provide either the named product or a comparable product by one of the other manufacturers specified.

2.2 MATERIALS

Aluminum: Alloy and temper recommended by manufacturer for type of use and finish indicated.

1. Extruded Bars, Profiles, and Tubes: ASTM B 221.
2. Cast Aluminum: ASTM B 179.
3. Flat Sheet: ASTM B 209.

Steel: Comply with the following:

4. Steel Plates, Shapes, and Bars: ASTM A 36/A 36M, hot-dip galvanized.
5. Steel Pipe: ASTM A 53/A 53M or ASTM A 135, standard-weight, hot-dip galvanized.
6. Steel Tubing: ASTM A 500 or ASTM A 513, cold formed, hot-dip galvanized.
7. Steel Sheet: ASTM A 1011/A 1011M, hot-dip galvanized.
8. Perforated Metal: Steel sheet not less than 0.0747-inch uncoated thickness; hot-dip galvanized, manufacturer's standard perforation pattern.
9. Expanded Metal: ASTM F 1267, Type II (expanded and flattened), Class 1, 2, 3/4 No. 13 manufacturer's standard carbon-steel sheets, hot-dip galvanized, deburred after expansion.
10. Woven Wire Mesh: Manufacturer's standard, with wire complying with ASTM A 510.
11. Recycled Content: Provide products with average recycled content of steel products such that postconsumer recycled content plus one-half of preconsumer recycled content is not less than 25 percent.

Stainless-Steel Sheet: ASTM A 240/A 240M or ASTM A 666; Type 304.

Chain in first paragraph below is commonly used for swing chain by most manufacturers and may be used for other components requiring chain. Revise paragraph if another chain is required for Project in addition to or in lieu of 4/0 or 5/0 straight-link Chain and Fittings: ASTM A 467/A 467M, Class CS, 4/0 or 5/0, welded-straight-link coil chain; hot-dip galvanized. With commercial-quality, hot-dip galvanized steel connectors and swing or ring hangars.

- B. Castings and Hangers: Malleable iron, ASTM A 47/A 47M, Grade 32510, hot dip galvanized.
- C. Post Caps: Cast aluminum or color-impregnated, UV-stabilized, mold-resistant polyethylene or polypropylene; color to match posts.

- D. Platform Clamps and Hangers: Cast aluminum or zinc-plated steel, not less than 0.105-inch- nominal thickness.
- E. Hardware: Manufacturer's standard; commercial-quality; corrosion-resistant; hot-dip galvanized steel and iron, stainless steel, or aluminum; of a secure and vandal-resistant design.
- F. Fasteners: Manufacturer's standard; corrosion-resistant; hot-dip galvanized or plated steel and iron, or stainless steel; permanently capped, and theft resistant.
- G. Softwood Plywood: DOC PS 1, exterior.
- H. Wood: Species indicated, free of heart center.
 - 1. Douglas fir.
 - 2. Pine.
 - 3. Western red cedar.
 - 4. Redwood.

2.3 WOOD-PRESERVATIVE-TREATED MATERIALS

Delete this Article if not applicable. See Evaluations for discussion of formulations and requirements for preservative treatment. Preservative Treatment: Pressure-treat wood according to AWPAC2 (lumber) and AWPAC9 (plywood) and the following.

- 1. Use preservative chemicals acceptable to authorities having jurisdiction and containing no arsenic or chromium. Use chemical formulations that do not bleed through or otherwise adversely affect finishes. Do not use colorants to distinguish treated materials from untreated materials.
- 2. Kiln-dry lumber and plywood after treatment to a maximum moisture content, respectively, of 19 and 15 percent. Do not use materials that are warped or do not comply with requirements for untreated materials.
- 3. Mark each treated item with treatment quality mark of an inspection agency approved by the American Lumber Standards Committee Board of Review.
- 4. Do not preservative treat redwood all-heart redwood Western red cedar all-heart western red cedar.

2.4 PLAYGROUND EQUIPMENT FABRICATION

Assemble items in the shop to greatest extent possible to minimize field splicing and assembly. Disassemble units only as necessary for shipping and handling limitations. Clearly mark units for reassembly and coordinated installation. Use connections that maintain structural value of joined pieces.

- A. Metal Frame: Fabricate main-frame upright support posts from metal pipe or tubing with cross-section profile and dimensions as indicated. Form metal to required shapes and sizes, true to line and level with true curves and accurate angles and surfaces. Finish exposed surfaces to smooth, sharp, well-defined lines and arris.
 - 1. Fabricate secondary frame members, bracing, and connections from either steel or aluminum. Unless otherwise indicated, provide each pipe or tubing main-frame member with manufacturer's standard drainable bottom plate or support flange.

2. Form simple and compound curves in bars and extruded shapes by bending members in jigs to produce uniform curvature for each configuration required; maintain cross section of member throughout entire bend without buckling, twisting, cracking, or otherwise deforming exposed surfaces.
3. Cut, drill, and punch metals cleanly and accurately. Remove sharp or rough areas on exposed surfaces.
4. Mill joints to a tight, hairline fit. Cope or miter corner joints. Fabricate connections that will be exposed to weather in a manner to exclude water.
5. Comply with AWS recommended practices for shop welding and brazing. Weld and braze behind finished surfaces without distorting or discoloring exposed side. Clean exposed welded and brazed joints of flux, and dress exposed and contact surfaces.
6. Provide weep holes where water may accumulate.

Provide necessary rebates, lugs, and brackets to assemble units and to attach to other work. Cut, reinforce, drill, and tap to receive finish hardware, screws, and similar items, unless otherwise indicated.

- B. Provide castings that are sound and free of warp, cracks, blowholes, or other defects that impair strength or appearance. Grind, wire brush, sandblast, and buff castings to remove seams, gate marks, casting flash, and other casting marks.
- C. If wood frame is required for Project, retain paragraph and subparagraph below. Retain paragraph below if main-frame supports are composite construction. Coordinate with applicable requirements in "Materials" Article. Composite Frame: Fabricate main-frame upright support posts from metal and plastic with profile and dimensions as indicated. Fabricate secondary frame members, bracing, and connections from either steel or aluminum.
- D. If retaining first paragraph below, indicate overall dimensions and configuration on Drawings. Units are available in a variety of shapes or as dimensioned planks for creating play surfaces in many configurations. Verify unit shapes and play-surface configurations with manufacturers of products specified. Play Surfaces: Provide manufacturer's standard elevated drainable decks, platforms, landings, walkways, ramps, and similar transitional play surfaces, designed to withstand loads; fabricated from perforated or expanded metal made into floor units with slip-slip-resistant foot surfaces. Fabricate units in manufacturer's standard modular sizes and shapes to form assembled play surfaces indicated.

2.5 FREESTANDING PLAYGROUND EQUIPMENT AND STRUCTURES

Revise this Article to suit Project. Paragraphs and subparagraphs below are examples of freestanding equipment and are not intended to be all-inclusive. Indicate individual equipment or assembled systems' dimensions and elevations on Drawings or in schedules. Copy and re-edit samples if more than one type is required, or use samples as guides for developing paragraphs and subparagraphs for other types of playground equipment. Delete this Article if concrete for footings is specified in Division 03. Concrete Materials and Properties: Comply with requirements in Division 03 Section "Cast-in-Place Concrete" ACI 301 to produce normal-weight, air-entrained concrete with a minimum 28-day compressive strength of 3000 psi, 3-inch slump, and 1-inch- maximum-size aggregate.

- A. Concrete Materials and Properties: Dry-packaged concrete mix complying with ASTM C 387 and mixed at site with potable water, according to manufacturer's written instructions, to produce normal-weight concrete with a minimum 28-day compressive strength of 3000 psi, 3-inch slump, and 1-inch- maximum-size aggregate.

2.6 FINISHES, GENERAL

Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.

- A. Appearance of Finished Work: Variations in appearance of abutting or adjacent pieces are acceptable if they are within one-half of the range of approved Samples. Noticeable variations in the same piece are not acceptable. Variations in appearance of other components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

2.7 ALUMINUM FINISHES

Baked-Enamel Finish: Prepare, treat, and coat metal to comply with paint manufacturer's written instructions and as follows:

1. Thermosetting, modified-acrylic enamel primer/topcoat system complying with AAMA 2603 except with a minimum dry film thickness not less than 1.5 mils 3 to 5 mils, medium gloss.

PVC Finish: Manufacturer's standard, UV-stabilized, mold-resistant, slip-resistant, matte-textured, dipped or sprayed-on, PVC-plastisol finish, with flame retardant added, complying with coating manufacturer's written instructions for pretreatment, application, and minimum dry film thickness of 80 mils 100 mils.

- B. Color: As indicated by manufacturer's designations.

2.8 IRON AND STEEL FINISHES

Galvanizing: Hot-dip galvanize products made from rolled-, pressed-, and forged-steel shapes, castings, plates, bars, and strips indicated to be galvanized to comply with ASTM A 123/A 123M.

1. Hot dip galvanized steel and iron hardware indicated to be galvanized to comply with ASTM A 153/A 153M.
2. Galvanized Steel Sheet: Commercial steel sheet, hot-dip galvanized, complying with ASTM A 653/A 653M for not less than G60 coating designation; mill phosphatized.

Powder-Coat Finish: Prepare, treat, and coat ferrous metal to comply with resin manufacturer's written instructions and as follows:

3. Apply thermosetting polyester or acrylic urethane powder coating with cured-film thickness not less than 1.5 mils.

Baked-Enamel Finish: Immediately after cleaning and pretreating, apply manufacturer's standard two-coat, baked-enamel finish consisting of prime coat and thermosetting topcoat. Comply with paint manufacturer's written instructions for applying and baking to achieve a minimum dry film thickness of 2 mils.

- B. PVC Finish: Manufacturer's standard, UV-stabilized, mold-resistant, slip-resistant, matte-textured, dipped or sprayed-on, PVC-plastisol finish, with flame retardant added, complying with coating manufacturer's written instructions for pretreatment, application, and minimum dry film thickness of 80 mils 100 mils.

- C. Color: As indicated by manufacturer's designations Match Architect's sample As selected by Architect from manufacturer's full range.

2.9 STAINLESS-STEEL FINISHES

Remove tool and die marks and stretch lines or blend into finish.

- A. Finished in paragraph below is a rolled finish applied to metal sheet before fabrication. Rolled finishes require care during fabrication to avoid damage. Bright, Cold-Rolled, Unpolished Finish: No. 2B finish on exposed faces.

PART 3 - EXECUTION

3.1 EXAMINATION

Examine areas and conditions, with Installer present, for compliance with requirements for site clearing, earthwork, site surface and subgrade 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 Architect.
2. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

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

3.3 INSTALLATION, GENERAL

General: Comply with manufacturer's written installation instructions, unless more stringent requirements are indicated. Anchor playground equipment securely, positioned at locations and elevations indicated.

1. Maximum Equipment Height: Coordinate installed heights of equipment and components with finished elevations 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.

Post and Footing Excavation: Excavate holes for posts and footings as indicated in firm, undisturbed or compacted subgrade soil.

- B. Retain paragraph below for playground equipment set without concrete or delete if playground equipment is attached to a supporting structure that does not require support by concrete footings. Retain paragraphs and subparagraphs below if playground equipment is set with concrete footings. Most playground equipment requires concrete footings. Post Set with Concrete Footing: Comply with ACI 301 for measuring, batching, mixing, transporting, forming, and placing concrete.

1. Set equipment posts in concrete footing. Protect portion of posts above footing from concrete splatter. Verify that posts are set plumb or at the correct angle, alignment, height, and spacing.

- a. Place concrete around posts and vibrate or tamp for consolidation. Hold posts in position during placement and finishing operations until concrete is sufficiently cured.
2. Embedded Items: Use setting drawings and manufacturer's written instructions to ensure correct installation of anchorages for equipment.
3. Concrete Footings: Smooth top, and shape to shed water.

3.4 FIELD QUALITY CONTROL

Retain first option in paragraph below if Owner engages agency; retain second option if Contractor engages agency. If retaining second option, retain requirement for field quality-control test reports in Part 1 "Submittals" Article. Testing Agency: Owner will engage a qualified independent testing and inspecting agency to perform field tests and inspections and prepare test reports.

- A. Verify availability and terms of inspection for technical representation with manufacturers of specified equipment at Project site. Revise source of report to a qualified playground consultant or certified National Recreation and Park Association/National Playground Safety Institute playground safety inspector if required. See Evaluations. Arrange for playground equipment manufacturer's technical personnel to inspect playground and playground equipment and components during installation and at final completion and to certify compliance with the following:
 1. ASTM F 1487.
 2. CPSC No. 325.

Retain paragraph below if Architect or Owner wants to be present during final inspection. Notify Architect Owner 48 hours in advance of date and time of final inspection.

END OF SECTION

SECTION 312000 - EARTH MOVING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Excavating and filling for rough grading the Site.
2. Preparing subgrades for pavements.
3. Excavating and backfilling for buildings and structures.
4. Drainage course for concrete slabs-on-grade.
5. Subbase course for concrete pavements.
6. Subbase course and base course for asphalt paving.
7. Subsurface drainage backfill for walls and trenches.
8. Excavating and backfilling trenches for utilities and pits for buried utility structures.
9. Excavating well hole to accommodate elevator-cylinder assembly.

B. Related Requirements:

1. Section 013200 "Construction Progress Documentation" Section 013233 "Photographic Documentation" for recording preexcavation and earth-moving progress.
2. Section 311000 "Site Clearing" for site stripping, grubbing, stripping and stockpiling topsoil, and removal of above- and below-grade improvements and utilities.
3. Section 315000 "Excavation Support and Protection" for shoring, bracing, and sheet piling of excavations.
4. Section 316329 "Drilled Concrete Piers and Shafts" for excavation of shafts and disposal of surplus excavated material.
5. Section 329200 "Turf and Grasses" for finish grading in turf and grass areas, including preparing and placing planting soil for turf areas.
6. Section 329300 "Plants" for finish grading in planting areas and tree and shrub pit excavation and planting.

1.2 UNIT PRICES

- A. Work of this Section is affected by unit prices for earth moving specified in Section 012200 "Unit Prices."
- B. Quantity allowances for earth moving are included in Section 012100 "Allowances."
- C. Rock Measurement: Volume of rock actually removed, measured in original position, but not to exceed the following. Unit prices for rock excavation include replacement with approved materials.
 1. 24 inches outside of concrete forms other than at footings.

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. Base Course: Aggregate layer placed between the subbase course and hot-mix asphalt paving.
- C. Bedding Course: Aggregate layer placed over the excavated subgrade in a trench before laying pipe.
- D. Borrow Soil: Satisfactory soil imported from off-site for use as fill or backfill.
- E. Drainage Course: Aggregate layer supporting the slab-on-grade that also minimizes upward capillary flow of pore water.
- F. 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 for changes in the Work.
 - 2. Bulk Excavation: Excavation more than 10 feet in width and more than 10 feet in length.
 - 3. 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, will be without additional compensation.
- G. Fill: Soil materials used to raise existing grades.
- H. Rock:
 - 1. Rock material in beds, ledges, unstratified masses, conglomerate deposits, and boulders of rock material that exceed 1 cu. yd. for footing, trench, and pit excavation that cannot be removed by rock-excavating equipment equivalent to the following in size and performance ratings, without systematic drilling, ram hammering, ripping, or blasting, when permitted:
 - a. Equipment for Footing, Trench, and Pit Excavation: Late-model, track-mounted hydraulic excavator; equipped with a 42-inch- maximum-width, short-tip-radius rock bucket; rated at not less than 138-hp flywheel power with bucket-curling force of not less than 28,700 lbf and stick-crowd force of not less than 18,400 lbf with extra-long reach boom.
 - b. Equipment for Bulk Excavation: Late-model, track-mounted loader; rated at not less than 230-hp flywheel power and developing a minimum of 47,992-lbf breakout force with a general-purpose bare bucket.

2. Rock material in beds, ledges, unstratified masses, conglomerate deposits, and boulders of rock material 3/4 cu. yd or more in volume that exceed a standard penetration resistance of 100 blows/2 inches when tested by a geotechnical testing agency, according to ASTM D1586.
- I. Structures: Buildings, footings, foundations, retaining walls, slabs, tanks, curbs, mechanical and electrical appurtenances, or other fabricated stationary features constructed above or below the ground surface.
- J. 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.
- K. 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.
- L. Utilities: On-site underground pipes, conduits, ducts, and cables as well as underground services within buildings.

1.4 PREINSTALLATION MEETINGS

- A. Preinstallation Conference: Conduct preinstallation conference at Pooler Basketball courts, 900 S Rogers Street Pooler, Ga, 31322.
 1. Review methods and procedures related to earthmoving, including, but not limited to, the following:
 - a. Personnel and equipment needed to make progress and avoid delays.
 - b. Coordination of Work with utility locator service.
 - c. Coordination of Work and equipment movement with the locations of tree- and plant-protection zones.
 - d. Extent of trenching by hand or with air spade.
 - e. Field quality control.

1.5 ACTION SUBMITTALS

- A. Product Data: For each type of the following manufactured products required:
 1. Geotextiles.
 2. Controlled low-strength material, including design mixture.
 3. Geofoam.
 4. Warning tapes.
- B. Samples for Verification: For the following products, in sizes indicated below:
 1. Geotextile: 12 by 12 inches.
 2. Warning Tape: 12 inches long; of each color.

1.6 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For qualified testing agency.
- B. Material Test Reports: For each on-site and borrow soil material proposed for fill and backfill as follows:
 - 1. Classification according to ASTM D2487.
 - 2. Laboratory compaction curve according to ASTM D698
- C. Preexcavation Photographs or Videotape: Show existing conditions of adjoining construction and site improvements, including finish surfaces that might be misconstrued as damage caused by earth-moving operations. Submit before earth moving begins.

1.7 QUALITY ASSURANCE

- A. FIELD CONDITIONS
- B. 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.
- C. 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.
- D. Utility Locator Service: Notify utility locator service for area where Project is located before beginning earth-moving operations.
- E. Do not commence earth-moving operations until temporary site fencing and erosion- and sedimentation-control measures specified in Section 015000 "Temporary Facilities and Controls" and Section 311000 "Site Clearing" are in place.
- F. Do not commence earth-moving operations until plant-protection measures specified in Section 015639 "Temporary Tree and Plant Protection" are in place.
- G. 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.

- H. Do not direct vehicle or equipment exhaust towards protection zones.
- I. 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 GW, GP, GM, SW, SP, and SM according to ASTM D2487 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.
 - 1. Liquid Limit:
 - 2. Plasticity Index:
- C. Unsatisfactory Soils: Soil Classification Groups GC, SC, CL, ML, OL, CH, MH, OH, and PT according to ASTM D2487 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 D2940/D2940M; 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 D2940/D2940M; 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 D2940/D2940M; 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 D2940/D2940M; 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 D448; 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 D448; 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 C33/C33M; fine aggregate.
- K. Impervious Fill: Clayey gravel and sand mixture capable of compacting to a dense state.

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 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.
 - 2. Remove rock to lines and grades indicated to permit installation of permanent construction without exceeding the following dimensions:
 - a. 24 inches outside of concrete forms other than at footings.
 - b. Outside dimensions of concrete walls indicated to be cast against rock without forms or exterior waterproofing treatments.
 - c. 6 inches beneath bottom of concrete slabs-on-grade.
- B. Classified Excavation: Excavate to subgrade elevations. Material to be excavated will be classified as earth and rock. Do not excavate rock until it has been classified and cross sectioned by Architect. The Contract Sum will be adjusted for rock excavation according to unit prices included in the Contract Documents. Changes in the Contract Time may be authorized for rock excavation.
 - 1. Earth excavation includes excavating pavements and obstructions visible on surface; underground structures, utilities, and other items indicated to be removed; and soil, boulders, and other materials not classified as rock or unauthorized excavation.
 - a. Intermittent drilling; blasting, if permitted; ram hammering; or ripping of material not classified as rock excavation is earth excavation.

2. Rock excavation includes removal and disposal of rock. Remove rock to lines and subgrade elevations indicated to permit installation of permanent construction without exceeding the following dimensions:
 - a. 24 inches outside of concrete forms other than at footings.
 - b. Outside dimensions of concrete walls indicated to be cast against rock without forms or exterior waterproofing treatments.
 - c. 6 inches beneath bottom of concrete slabs-on-grade.

3.3 EXCAVATION FOR WALKS AND PAVEMENTS

- A. Excavate surfaces under walks and pavements to indicated lines, cross sections, elevations, and subgrades.

3.4 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 for changes in the Work.
- E. Reconstruct subgrades damaged by freezing temperatures, frost, rain, accumulated water, or construction activities, as directed by Architect, without additional compensation.

3.5 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.

3.6 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.

3.7 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.

3.8 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 steps and ramps, use engineered fill.
 - 4. Under building slabs, use engineered fill.
 - 5. Under footings and foundations, use engineered fill.
- C. Place soil fill on subgrades free of mud, frost, snow, or ice.

3.9 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.

3.10 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 D698
 - 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.

3.11 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. Pavements: Plus or minus 1/2 inch

3.12 SUBBASE AND BASE COURSES UNDER PAVEMENTS AND WALKS

- A. Place subbase course and base course on subgrades free of mud, frost, snow, or ice.
- B. On prepared subgrade, place subbase course and base course under pavements and walks as follows:
 - 1. Install separation geotextile on prepared subgrade according to manufacturer's written instructions, overlapping sides and ends.
 - 2. Place base course material over subbase course under hot-mix asphalt pavement.
 - 3. Shape subbase course and base course to required crown elevations and cross-slope grades.
 - 4. Place subbase course and base course 6 inches or less in compacted thickness in a single layer.
 - 5. Place subbase course and base course that exceeds 6 inches in compacted thickness in layers of equal thickness, with no compacted layer more than 6 inches thick or less than 3 inches thick.

6. Compact subbase course and base course at optimum moisture content to required grades, lines, cross sections, and thickness to not less than 95 percent of maximum dry unit weight according to ASTM D698
- C. Pavement Shoulders: Place shoulders along edges of subbase course and base course to prevent lateral movement. Construct shoulders, at least 12 inches wide, of satisfactory soil materials and compact simultaneously with each subbase and base layer to not less than 95 percent of maximum dry unit weight according to ASTM D698

3.13 DRAINAGE COURSE UNDER CONCRETE SLABS-ON-GRADE

- A. Place drainage course on subgrades free of mud, frost, snow, or ice.
- B. On prepared subgrade, place and compact drainage course under cast-in-place concrete slabs-on-grade as follows:
 1. Install subdrainage geotextile on prepared subgrade according to manufacturer's written instructions, overlapping sides and ends.
 2. Place drainage course 6 inches or less in compacted thickness in a single layer.
 3. Place drainage course that exceeds 6 inches in compacted thickness in layers of equal thickness, with no compacted layer more than 6 inches thick or less than 3 inches thick.
 4. Compact each layer of drainage course to required cross sections and thicknesses to not less than 95 percent of maximum dry unit weight according to ASTM D698.

3.14 FIELD QUALITY CONTROL

- A. Special Inspections: Owner will engage a qualified special inspector to perform the following special inspections:
 1. Determine prior to placement of fill that site has been prepared in compliance with requirements.
 2. Determine that fill material classification and maximum lift thickness comply with requirements.
 3. Determine, during placement and compaction, that in-place density of compacted fill complies with requirements.
- B. Testing Agency: Owner will engage a qualified geotechnical engineering testing agency to perform tests and inspections.
- C. 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.
- D. Testing agency will test compaction of soils in place according to ASTM D1556, ASTM D2167, ASTM D2937, and ASTM D6938, 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.
- 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.

3.15 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.

3.16 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.
- B. Transport surplus satisfactory soil to designated storage areas on Owner's property. Stockpile or spread soil as directed by Architect.
 1. Remove waste materials, including unsatisfactory soil, trash, and debris, and legally dispose of them off Owner's property.

END OF SECTION

SECTION 315000 - EXCAVATION SUPPORT AND PROTECTION

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 temporary excavation support and protection systems.
- B. Related Requirements:
 - 1. Retain subparagraphs below to cross-reference requirements Contractor might expect to find in this Section but are specified in other Sections. Section 013233 "Photographic Documentation" for recording preexisting conditions and excavation support and protection system progress.
 - 2. Section 312000 "Earth Moving" for excavating and backfilling, for controlling surface-water runoff and ponding, and for dewatering excavations.

1.3 PREINSTALLATION MEETINGS

- A. Retain "Preinstallation Conference" Paragraph below if Work of this Section is extensive or complex enough to justify a conference. Preinstallation Conference: Conduct conference at 900 S Rogers St., Pooler, GA.
 - 1. If needed, insert list of conference participants not mentioned in Section 013100 "Project Management and Coordination." Retain one or more subparagraphs below if additional agenda items specific to Project are required but not mentioned in Section 013100 "Project Management and Coordination"; revise to suit Project. Review existing utilities and subsurface conditions.
 - 2. Review coordination for interruption, shutoff, capping, and continuation of utility services.
 - 3. Review proposed excavations.
 - 4. Review proposed equipment.
 - 5. Review monitoring of excavation support and protection system.
 - 6. Review coordination with waterproofing.
 - 7. Review abandonment or removal of excavation support and protection system.

1.4 ACTION SUBMITTALS

- A. Delete "Product Data" Paragraph below if Contractor designs temporary excavation support and protection. Retain paragraph if the design responsibility for excavation support and protection remains with the design professional, such as for permanent installations or if the design professional imposes important product requirements. Revise to suit Project. Product Data: For each type of product.
 - 1. Include construction details, material descriptions, performance properties, and dimensions of individual components and profiles, and calculations for excavation support and protection system.

- B. Shop Drawings: For excavation support and protection system, prepared by or under the supervision of a qualified professional engineer.
 - 1. Include plans, elevations, sections, and details.
 - 2. Show arrangement, locations, and details of soldier piles, piling, lagging, tiebacks, bracing, and other components of excavation support and protection system according to engineering design.
 - 3. Indicate type and location of waterproofing.
 - 4. Include a written plan for excavation support and protection, including sequence of construction of support and protection coordinated with progress of excavation.
- C. Retain "Delegated-Design Submittal" Paragraph below if design services have been delegated to Contractor and if excavations exceed 5 feet (1.524 m) in depth. Delegated-Design Submittal: For excavation support and protection systems, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

1.5 INFORMATIONAL SUBMITTALS

- A. Coordinate "Qualification Data" Paragraph below with qualification requirements in Section 014000 "Quality Requirements." Qualification Data: For the following:
 - 1. Land surveyor.
 - 2. Professional Engineer: Experience with providing delegated-design engineering services of the type indicated, including documentation that engineer is licensed in the Pooler, GA in which Project is located.
- B. Retain "Contractor Calculations" Paragraph below if design services have been delegated to Contractor and if excavations exceed 5 feet (1.524 m) in depth. Delete paragraph if Owner's design professional designs the excavation support and protection system, which is less common. Contractor Calculations: For excavation support and protection system. Include analysis data signed and sealed by the qualified professional engineer responsible for their preparation.
- C. Existing Conditions: Using photographs and video recordings, show existing conditions of adjacent construction and site improvements that might be misconstrued as damage caused by inadequate performance of excavation support and protection systems. Submit before Work begins.

1.6 CLOSEOUT SUBMITTALS

- A. Record Drawings: Identify locations and depths of capped utilities, abandoned-in-place support and protection systems, and other subsurface structural, electrical, or mechanical conditions.

1.7 FIELD CONDITIONS

- A. Interruption of Existing Utilities: Do not interrupt any utility-serving facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary utility according to requirements indicated:
 - 1. Notify Owner no fewer than five days in advance of proposed interruption of utility.
 - 2. Do not proceed with interruption of utility without Owner's written permission.
- B. Survey Work: Engage a qualified land surveyor or professional engineer to survey adjacent existing buildings, structures, and site improvements; establish exact elevations at fixed points to act as benchmarks. Clearly identify benchmarks, and record existing elevations.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Revise this article according to requirements of authorities having jurisdiction and customary practice in Project's location. Retain "Delegated Design" Paragraph below if Contractor is required to assume responsibility for design. Delegated Design: Engage a qualified professional engineer, as defined in Section 014000 "Quality Requirements," to design excavation support and protection systems to resist all lateral loading and surcharge, including but not limited to, retained soil, groundwater pressure, adjacent building loads, adjacent traffic loads, construction traffic loads, material stockpile loads, and seismic loads, based on the following:
 - 1. Compliance with OSHA Standards and interpretations, 29 CFR 1926, Subpart P.
 - 2. Compliance with AASHTO Standard Specification for Highway Bridges or AASHTO LRFD Bridge Design Specification, Customary U.S. Units.
 - 3. Compliance with requirements of authorities having jurisdiction.
 - 4. Compliance with utility company requirements.
 - 5. Compliance with railroad requirements.

2.2 MATERIALS

- A. Retain one or more paragraphs in this article if prescribing excavation support and protection system requirements or for permanent installations; insert other requirements if required. Delete article if Contractor designs temporary excavation support and protection. Provide materials that are either new or in serviceable condition.
- B. Structural Steel: ASTM A 36/A 36M, ASTM A 690/A 690M, or ASTM A 992/A 992M.
- C. Steel Sheet Piling: ASTM A 328/A 328M, ASTM A 572/A 572M, or ASTM A 690/A 690M; with continuous interlocks.
 - 1. Before retaining, verify availability, with sheet piling manufacturer, of second option in "Corners" Subparagraph below. Corners: Site-fabricated mechanical interlock.
- D. Wood Lagging: Lumber, mixed hardwood, nominal rough thickness 4 inches.
- E. Shotcrete: Comply with Section 033713 "Shotcrete" for shotcrete materials and mixes, reinforcement, and shotcrete application.
- F. Cast-in-Place Concrete: ACI 301, of compressive strength required for application.
- G. Reinforcing Bars: ASTM A 615/A 615M, Grade 60, deformed.
- H. Tiebacks: Steel bars, ASTM A 722/A 722M.
- I. Tiebacks: Steel strand, ASTM A 416/A 416M.

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 that could develop during excavation support and protection system operations.
 - 1. Shore, support, and protect utilities encountered.

3.2 INSTALLATION - GENERAL

- A. Locate excavation support and protection systems clear of permanent construction, so that construction and finishing of other work is not impeded.
- B. Install excavation support and protection systems to ensure minimum interference with roads, streets, walks, and other adjacent occupied and used facilities.
 - 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 authorities having jurisdiction.
- C. Install excavation support and protection systems without damaging existing buildings, structures, and site improvements adjacent to excavation.

3.3 SOLDIER PILES AND LAGGING

- A. Install steel soldier piles before starting excavation.
 - 1. Extend soldier piles below excavation grade level to depths adequate to prevent lateral movement.
 - 2. Space soldier piles at regular intervals not to exceed allowable flexural strength of wood lagging.
 - 3. Accurately align exposed faces of flanges to vary not more than 2 inches from a horizontal line and not more than 1:120 out of vertical alignment.
- B. Install wood lagging within flanges of soldier piles as excavation proceeds.
 - 1. Trim excavation as required to install lagging.
 - 2. Fill voids behind lagging with soil, and compact.
- C. Install wales horizontally at locations indicated on Drawings and secure to soldier piles.

3.4 SHEET PILING

- A. Before starting excavation, install one-piece sheet piling lengths and tightly interlock vertical edges to form a continuous barrier.
- B. Accurately place the piling using templates and guide frames unless otherwise recommended in writing by the sheet piling manufacturer.

1. Limit vertical offset of adjacent sheet piling to 60 inches.
 2. Accurately align exposed faces of sheet piling to vary not more than 2 inches from a horizontal line and not more than 1:120 out of vertical alignment.
- C. Cut tops of sheet piling to uniform elevation at top of excavation.

3.5 TIEBACKS

- A. Most tieback systems are proprietary. Insert material requirements in Part 2 if a particular tieback is required. If tiebacks are permanent, consider requiring corrosion protection of tendons and anchorage connections. Drill, install, grout, and tension tiebacks.
- B. Test load-carrying capacity of each tieback, and replace and retest deficient tiebacks.
1. Have test loading observed by a qualified professional engineer responsible for design of excavation support and protection system.
- C. Maintain tiebacks in place until permanent construction is able to withstand lateral earth and hydrostatic pressures.

3.6 BRACING

- A. Locate bracing to clear columns, floor framing construction, and other permanent work. If necessary to move brace, install new bracing before removing original brace.
1. Do not place bracing where it will be cast into or included in permanent concrete work unless otherwise approved by Architect.
 2. Install internal bracing if required to prevent spreading or distortion of braced frames.
 3. Maintain bracing until structural elements are supported by other bracing or until permanent construction is able to withstand lateral earth and hydrostatic pressures.

3.7 MAINTENANCE

- A. Monitor and maintain excavation support and protection system.
- B. Prevent surface water from entering excavations by grading, dikes, or other means.
- C. Continuously monitor vibrations, settlements, and movements to ensure stability of excavations and constructed slopes and to ensure that damage to permanent structures is prevented.

3.8 FIELD QUALITY CONTROL

- A. Survey-Work Benchmarks: Resurvey benchmarks weekly during installation of excavation support and protection systems, excavation progress, and for as long as excavation remains open.
1. Maintain an accurate log of surveyed elevations and positions for comparison with original elevations and positions.
 2. Promptly notify Architect if changes in elevations or positions occur or if cracks, sags, or other damage is evident in adjacent construction.

- B. Promptly correct detected bulges, breakage, or other evidence of movement to ensure that excavation support and protection system remains stable.
- C. Promptly repair damages to adjacent facilities caused by installation or faulty performance of excavation support and protection systems.

3.9 REMOVAL AND REPAIRS

- A. Remove excavation support and protection systems when construction has progressed sufficiently to support excavation and earth and hydrostatic pressures.
 - 1. Remove in stages to avoid disturbing underlying soils and rock or damaging structures, pavements, facilities, and utilities.
 - 2. Remove excavation support and protection systems to a minimum depth of 48inches below overlying construction, and abandon remainder.
 - 3. Fill voids immediately with approved backfill compacted to density specified in Section 312000 "Earth Moving."
 - 4. Repair or replace, as approved by Architect, adjacent work damaged or displaced by removing excavation support and protection systems.
- B. Retain paragraph below if excavation support and protection system will be left in place. Leave excavation support and protection systems permanently in place.

END OF SECTION

PART 1 - SECTION 32 11 23 – AGGREGATE BASE COURSES

PART 2 - PART 1 – GENERAL

1.1 SUMMARY

A. Section includes furnishing and placing aggregate base course for pavements and other surfaces.

B. Related Sections:

- 1 2. Section 32 12 16 – Asphalt Paving
3. Section 03 00 00 – Cast in place concrete

1.2 REFERENCES

A. ASTM D1557 – Standard Test Method for Laboratory Compaction Characteristics of Soil Using Modified Effort

B. ASTM D2922 – Density of Soil and Soil-Aggregate in Place by Nuclear Methods

C. ASTM D3017 – Moisture Content of Soil and Soil-Aggregate in Place by Nuclear Methods

1.3 SUBMITTALS

A. Material source and gradation reports

B. Compaction test results

C. Delivery tickets for aggregate materials

1.4 QUALITY ASSURANCE

A. Perform field density tests in accordance with ASTM standards.

B. Use approved materials and methods conforming to project specifications.

PART 3 - PART 2 – PRODUCTS

2.1 MATERIALS

A. Aggregate base shall consist of crushed stone, gravel, or other approved material.

B. Gradation shall conform to local agency standards or project-specific requirements.

C. Material shall be free of organic matter and deleterious substances.

PART 4 - PART 3 – EXECUTION

3.1 EXAMINATION

A. Verify subgrade is prepared and approved before placing aggregate base.

3.2 INSTALLATION

A. Place aggregate base in uniform layers not exceeding 6 inches in compacted thickness.

B. Compact each layer to 95% of maximum dry density per ASTM D1557.

C. Maintain moisture content during compaction.

D. Finish surface to required grade and cross-section.

3.3 FIELD QUALITY CONTROL

- A. Perform field density and moisture tests.
- B. Recompact areas failing to meet specified compaction.

3.4 PROTECTION

- A. Protect finished base from contamination and damage until covered by subsequent work.

SECTION 321216 - ASPHALT PAVING

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. Hot-mix asphalt paving.
2. Hot-mix asphalt overlay.
3. Cold milling of existing asphalt pavement.
4. Hot-mix asphalt patching.
5. Asphalt curbs.
6. Asphalt traffic-calming devices.
7. Asphalt surface treatments.

- B. Related Requirements:

1. Section 312000 "Earth Moving" for subgrade preparation, fill material, separation geotextiles, unbound-aggregate subbase and base courses, and aggregate pavement shoulders.
2. 321800 Athletic Surfacing

1.3 UNIT PRICES

- A. Work of this Section is affected by asphalt.

1.4 PREINSTALLATION MEETING

- A. Preinstallation Conference: Conduct conference at Pooler Basketball Courts Pooler, Ga 31322.

1. Review methods and procedures related to hot-mix asphalt paving including, but not limited to, the following:
 - a. Review proposed sources of paving materials, including capabilities and location of plant that will manufacture hot-mix asphalt.
 - b. Review requirements for protecting paving work, including restriction of traffic during installation period and for remainder of construction period.

1.5 ACTION SUBMITTALS

- A. Product Data: Include technical data and tested physical and performance properties.
 - 1. Herbicide.
 - 2. Paving geotextile.
 - 3. Joint sealant.
- B. Hot-Mix Asphalt Designs:
 - 1. Certification, by authorities having jurisdiction, of approval of each hot-mix asphalt design proposed for the Work.
 - 2. For each hot-mix asphalt design proposed for the Work.
- C. Sustainable Design Submittals:
 - 1. Product Data: For recycled content, indicating postconsumer and preconsumer recycled content and cost.
- D. Samples for Verification: For the following product, in manufacturer's standard sizes unless otherwise indicated:
 - 1. Paving Geotextile: 12 by 12 inches minimum.

1.6 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For City of Pooler.
- B. Material Certificates:
 - 1. Aggregates.
 - 2. Asphalt binder.
 - 3. Asphalt cement.
 - 4. Cutback prime coat.
 - 5. Emulsified asphalt prime coat.
 - 6. Tack coat.
 - 7. Fog seal.
 - 8. Undersealing asphalt.
- C. Field quality-control reports.

1.7 QUALITY ASSURANCE

- A. Manufacturer Qualifications: GDOT.
- B. Testing Agency Qualifications: Qualified in accordance with ASTM D3666 for testing indicated.
- C. Regulatory Requirements: Comply with materials, workmanship, and other applicable requirements of GDOT for asphalt paving work.

1. Measurement and payment provisions and safety program submittals included in standard specifications do not apply to this Section.

1.8 FIELD CONDITIONS

- A. Environmental Limitations: Do not apply asphalt materials if subgrade is wet or excessively damp, if rain is imminent or expected before time required for adequate cure, or if the following conditions are not met:
 1. Prime Coat: Minimum surface temperature of 60 deg F.
 2. Tack Coat: Minimum surface temperature of 60 deg F.
 3. Slurry Coat: Comply with weather limitations in ASTM D3910.
 4. Asphalt Base Course and Binder Course: Minimum surface temperature of 40 deg F and rising at time of placement.
 5. Asphalt Surface Course: Minimum surface temperature of 60 deg F at time of placement.

PART 2 - PRODUCTS

2.1 AGGREGATES

- A. General: Use materials and gradations that have performed satisfactorily in previous installations.
- B. Coarse Aggregate: ASTM D692/D692M, sound; angular crushed stone, crushed gravel, or cured, crushed blast-furnace slag.
- C. Fine Aggregate: ASTM D1073, sharp-edged natural sand or sand prepared from stone, gravel, cured blast-furnace slag, or combinations thereof.
 1. For hot-mix asphalt, limit natural sand to a maximum of 20 percent by weight of the total aggregate mass.
- D. Mineral Filler: AASHTO M 17, rock or slag dust, hydraulic cement, or other inert material.

2.2 ASPHALT MATERIALS

- A. Asphalt Binder: ASTM D6373 or AASHTO M 320 binder designation PG 64-22
- B. Asphalt Cement: ASTM D3381/D3381M for viscosity-graded material.
- C. Cutback Prime Coat: ASTM D2027/D2027M,.
- D. Emulsified Asphalt Prime Coat: emulsified asphalt, or ASTM D2397/D2397M or AASHTO M 208 cationic emulsified asphalt, slow setting, diluted in water, of suitable grade and consistency for application.
- E. Tack Coat: emulsified asphalt, ASTM D2397/D2397M or AASHTO M 208 cationic emulsified asphalt, slow setting, diluted in water, of suitable grade and consistency for application.

- F. Fog Seal: emulsified asphalt, or ASTM D2397/D2397M or AASHTO M 208 cationic emulsified asphalt, slow setting, factory diluted in water, of suitable grade and consistency for application.
- G. Water: Potable.
- H. Undersealing Asphalt: ASTM D3141/D3141M; pumping consistency.

2.3 AUXILIARY MATERIALS

- A. Recycled Materials for Hot-Mix Asphalt Mixes: Reclaimed asphalt pavement; reclaimed, unbound-aggregate base material; and recycled asphalt shingles from sources and gradations that have performed satisfactorily in previous installations, equal to performance of required hot-mix asphalt paving produced from all new materials.
- B. Herbicide: Commercial chemical for weed control, registered by the EPA, and not classified as "restricted use" for locations and conditions of application. Provide in granular, liquid, or wettable powder form.
- C. Sand: ASTM D1073, Grade No. 2 or No. 3.
- D. Paving Geotextile: AASHTO M 288 paving fabric; nonwoven polypropylene; resistant to chemical attack, rot, and mildew; and specifically designed for paving applications.
- E. Joint Sealant: ASTM D6690, Type II or III, hot-applied, single-component, polymer-modified bituminous sealant.

2.4 MIXES

- A. Recycled Content of Hot-Mix Asphalt: Postconsumer recycled content plus one-half of preconsumer recycled content not less than 20 percent or more than 25 percent by weight.
 - 1. Surface Course Limit: Recycled content no more than 10 percent by weight.
- B. Hot-Mix Asphalt: Dense-graded, hot-laid, hot-mix asphalt plant mixes approved by authorities having jurisdiction; designed in accordance with procedures in AI MS-2, "Asphalt Mix Design Methods"; and complying with the following requirements:
 - 1. Provide mixes with a history of satisfactory performance in geographical area where Project is located.
 - 2. Base Course: 19mm Superpave
 - 3. Binder Course: 12.5 mm Superpave>.
 - 4. Surface Course: 9.5 mm Superpave
- C. Emulsified-Asphalt Slurry: ASTM D3910, Type 2.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify that subgrade is dry and in suitable condition to begin paving.
- B. Proceed with paving only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Protection: Provide protective materials, procedures, and worker training to prevent asphalt materials from spilling, coating, or building up on curbs, driveway aprons, manholes, and other surfaces adjacent to the Work.
- B. Proof-roll subgrade below pavements with heavy pneumatic-tired equipment 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. Proof-roll with a loaded 10-wheel, tandem-axle dump truck weighing not less than 15 tons.
 - 3. 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.

3.3 SURFACE PREPARATION

- A. Ensure that prepared subgrade has been proof-rolled and is ready to receive paving. Immediately before placing asphalt materials, remove loose and deleterious material from substrate surfaces.
- B. Herbicide Treatment: Apply herbicide in accordance with manufacturer's recommended rates and written application instructions. Apply to dry, prepared subgrade or surface of compacted-aggregate base before applying paving materials.
 - 1. Mix herbicide with prime coat if formulated by manufacturer for that purpose.
- C. Cutback Prime Coat: Apply uniformly over surface of compacted unbound-aggregate base course at a rate of 0.15 to 0.50 gal./sq. yd.. Apply enough material to penetrate and seal, but not flood, surface. Allow prime coat to cure.
 - 1. If prime coat is not entirely absorbed within 24 hours after application, spread sand over surface to blot excess asphalt. Use enough sand to prevent pickup under traffic. Remove loose sand by sweeping before pavement is placed and after volatiles have evaporated.
 - 2. Protect primed substrate from damage until ready to receive paving.
- D. Emulsified Asphalt Prime Coat: Apply uniformly over surface of compacted unbound-aggregate base course at a rate of 0.10 to 0.30 gal./sq. yd. per inch depth. Apply enough material to penetrate and seal, but not flood, surface. Allow prime coat to cure.

1. If prime coat is not entirely absorbed within 24 hours after application, spread sand over surface to blot excess asphalt. Use enough sand to prevent pickup under traffic. Remove loose sand by sweeping before pavement is placed and after volatiles have evaporated.
 2. Protect primed substrate from damage until ready to receive paving.
- E. Tack Coat: Apply uniformly to surfaces of existing pavement at a rate of 0.05 to 0.15 gal./sq. yd..
1. Allow tack coat to cure undisturbed before applying hot-mix asphalt paving.
 2. Avoid smearing or staining adjoining surfaces, appurtenances, and surroundings. Remove spillages and clean affected surfaces.

3.4 HOT-MIX ASPHALT PLACEMENT

- A. Machine place hot-mix asphalt on prepared surface, spread uniformly, and strike off. Place asphalt mix by hand in areas inaccessible to equipment in a manner that prevents segregation of mix. Place each course to required grade, cross section, and thickness when compacted.
1. Place hot-mix asphalt base course and binder course in number of lifts and thicknesses indicated.
 2. Place hot-mix asphalt surface course in single lift.
 3. Spread mix at a minimum temperature of 250 deg F.
 4. Begin applying mix along centerline of crown for crowned sections and on high side of one-way slopes unless otherwise indicated.
 5. Regulate paver machine speed to obtain smooth, continuous surface free of pulls and tears in asphalt-paving mat.
- B. Place paving in consecutive strips not less than 10 feet wide unless infill edge strips of a lesser width are required.
1. After first strip has been placed and rolled, place succeeding strips and extend rolling to overlap previous strips. Overlap mix placement about 1 to 1-1/2 inches from strip to strip to ensure proper compaction of mix along longitudinal joints.
 2. Complete a section of asphalt base course and binder course before placing asphalt surface course.
- C. Promptly correct surface irregularities in paving course behind paver. Use suitable hand tools to remove excess material forming high spots. Fill depressions with hot-mix asphalt to prevent segregation of mix; use suitable hand tools to smooth surface.

3.5 JOINTS

- A. Construct joints to ensure a continuous bond between adjoining paving sections. Construct joints free of depressions, with same texture and smoothness as other sections of hot-mix asphalt course.
1. Clean contact surfaces and apply tack coat to joints.
 2. Offset longitudinal joints, in successive courses, a minimum of 6 inches.
 3. Offset transverse joints, in successive courses, a minimum of 24 inches.

4. Construct transverse joints at each point where paver ends a day's work and resumes work at a subsequent time. Construct these joints AI MS-22, for both "Ending a Lane" and "Resumption of Paving Operations."
5. Compact joints as soon as hot-mix asphalt will bear roller weight without excessive displacement.
6. Compact asphalt at joints to a density within 2 percent of specified course density.

3.6 COMPACTION

- A. General: Begin compaction as soon as placed hot-mix paving will bear roller weight without excessive displacement. Compact hot-mix paving with hot hand tampers or with vibratory-plate compactors in areas inaccessible to rollers.
 1. Complete compaction before mix temperature cools to 185 deg F.
- B. Breakdown Rolling: Complete breakdown or initial rolling immediately after rolling joints and outside edge. Examine surface immediately after breakdown rolling for indicated crown, grade, and smoothness. Correct laydown and rolling operations to comply with requirements.
- C. Intermediate Rolling: Begin intermediate rolling immediately after breakdown rolling while hot-mix asphalt is still hot enough to achieve specified density. Continue rolling until hot-mix asphalt course has been uniformly compacted to the following density:
 1. Average Density, Marshall Test Method: 96 percent of reference laboratory density in accordance with ASTM D6927 or AASHTO T 245, but not less than 94 percent or greater than 100 percent.
 2. Average Density, Rice Test Method: 92 percent of reference maximum theoretical density in accordance with ASTM D2041/D2041M, but not less than 90 percent or greater than 96 percent.
- D. Finish Rolling: Finish roll paved surfaces to remove roller marks while hot-mix asphalt is still warm.
- E. Edge Shaping: While surface is being compacted and finished, trim edges of pavement to proper alignment. Bevel edges while asphalt is still hot; compact thoroughly.
- F. Repairs: Remove paved areas that are defective or contaminated with foreign materials and replace with fresh, hot-mix asphalt. Compact by rolling to specified density and surface smoothness.
- G. Protection: After final rolling, do not permit vehicular traffic on pavement until it has cooled and hardened.
- H. Erect barricades to protect paving from traffic until mixture has cooled enough not to become marked.
- I. Pavement Thickness: Compact each course to produce thickness indicated within the following tolerances:
 1. Base Course and Binder Course: Plus or minus 1/2 inch.

2. Surface Course: Plus 1/4 inch, no minus.

J. Pavement Surface Smoothness: Compact each course to produce surface smoothness within the following tolerances as determined by using a 10-foot straightedge applied transversely or longitudinally to paved areas:

1. Base Course and Binder Course: 1/4 inch
2. Surface Course: 1/8 inch
3. Crowned Surfaces: Test with crowned template centered and at right angle to crown. Maximum allowable variance from template is 1/4 inch.

K. Asphalt Traffic-Calming Devices: Compact and form asphalt to the shapes indicated and within a tolerance of plus or minus 1/8 inch of height indicated above pavement surface.

3.7 SURFACE TREATMENTS

A. Fog Seals: Apply fog seal at a rate of 0.10 to 0.15 gal./sq. yd. to existing asphalt pavement and allow to cure. With fine sand, lightly dust areas receiving excess fog seal.

B. Slurry Seals: Apply slurry coat in a uniform thickness in accordance with ASTM D3910 and allow to cure.

1. Roll slurry seal to remove ridges and provide a uniform, smooth surface.

3.8 FIELD QUALITY CONTROL

A. Testing Agency: Owner will engage a qualified testing agency to perform tests and inspections.

B. Thickness: In-place compacted thickness of hot-mix asphalt courses will be determined in accordance with ASTM D3549/D3549M.

C. Surface Smoothness: Finished surface of each hot-mix asphalt course will be tested for compliance with smoothness tolerances.

D. Asphalt Traffic-Calming Devices: Finished height of traffic-calming devices above pavement will be measured for compliance with tolerances.

E. In-Place Density: Testing agency will take samples of uncompacted paving mixtures and compacted pavement in accordance with ASTM D979/D979M or AASHTO T 168.

1. Reference maximum theoretical density will be determined by averaging results from four samples of hot-mix asphalt-paving mixture delivered daily to site, prepared in accordance with ASTM D2041/D2041M, and compacted in accordance with job-mix specifications.
2. In-place density of compacted pavement will be determined by testing core samples in accordance with ASTM D1188 or ASTM D2726/D2726M.
 - a. One core sample will be taken for every 1000 sq. yd. or less of installed pavement, with no fewer than three cores taken.

- b. Field density of in-place compacted pavement may also be determined by nuclear method in accordance with ASTM D2950/D2950M and coordinated with ASTM D1188 or ASTM D2726/D2726M.
- F. Replace and compact hot-mix asphalt where core tests were taken.
- G. Remove and replace or install additional hot-mix asphalt where test results or measurements indicate that it does not comply with specified requirements.

3.9 WASTE HANDLING

- A. General: Handle asphalt-paving waste in accordance with approved waste management plan required in Section 017419 "Construction Waste Management and Disposal."

END OF SECTION

SECTION 321723 - PAVEMENT MARKINGS

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. Painted markings applied to asphalt paving.
 - 2. Painted markings applied to concrete surfaces.
- B. Related Requirements:
 - 1. Retain subparagraphs below to cross-reference requirements Contractor might expect to find in this Section but are specified in other Sections. Section 071800 "Traffic Coatings" for painting whole areas of building floors and pavements with coatings having an integral wearing surface.
 - 2. Section 099113 "Exterior Painting" for painting exterior concrete surfaces other than pavement markings.
 - 3. Section 099123 "Interior Painting" for painting interior concrete surfaces other than pavement markings.

1.3 PREINSTALLATION MEETINGS

- A. Retain "Preinstallation Conference" Paragraph below if Work of this Section is extensive or complex enough to justify a conference. Preinstallation Conference: Conduct conference at 900 S. Rogers St., Pooler, GA.
 - 1. If needed, insert list of conference participants not mentioned in Section 013100 "Project Management and Coordination." Retain subparagraph below if additional requirements are necessary. Insert additional requirements to suit Project. Review methods and procedures related to marking asphalt paving or concrete surfaces including, but not limited to, the following:
 - a. Asphalt-paving or concrete-surface aging period before application of pavement markings.
 - b. Review requirements for protecting pavement markings, including restriction of traffic during installation period.

1.4 ACTION SUBMITTALS

- A. Product Data: Include technical data and tested physical and performance properties.
 - 1. Pavement-marking paint, acrylic.
- B. Shop Drawings:

1. Indicate pavement markings, colors, lane separations, defined parking spaces, and dimensions to adjacent work.
 2. Indicate, with international symbol of accessibility, spaces allocated for people with disabilities.
- C. Samples: For each exposed product and for each color and texture specified; on rigid backing, 8 inches square.

1.5 QUALITY ASSURANCE

- A. Retain "Regulatory Requirements" Paragraph below if pavement-marking work is located on public property and must comply with requirements of state or local DOT. Regulatory Requirements: Comply with materials, workmanship, and other applicable requirements of ASTM of GDOT for pavement-marking work.
1. Measurement and payment provisions and safety program submittals included in standard specifications do not apply to this Section.

1.6 FIELD CONDITIONS

- A. Environmental Limitations: Proceed with pavement marking only on clean, dry surfaces and at a minimum ambient or surface temperature of 55 deg F] and not exceeding 95 deg F.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Retain "Manufacturers" Paragraph and list of manufacturers below to require products from manufacturers listed or a comparable product from other manufacturers. 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]:
1. Aexcel Inc.
 2. Colorado Paint Company; a subsidiary of Swarco Industries Inc.
 3. Columbia Paint & Coatings, Inc.; a subsidiary of Sherwin-Williams Company (The).
 4. Conco Paints.
 5. Diamond Vogel Paints.
 6. Dow Chemical Company (The).
 7. Dunn-Edwards Corporation.
 8. Ennis-Flint.
 9. Farrell-Calhoun.
 10. General Paint.
 11. Insl-X Products; Benjamin Moore & Co.
 12. Kelly-Moore Paint Company Inc.
 13. McCormick Paints.
 14. PPG Paints.
 15. Rodda Paint Co.
 16. Rust-Oleum Corporation; a subsidiary of RPM International, Inc.
 17. Scott Paint.
 18. Sherwin-Williams Company (The).
 19. Transpo Industries, Inc.

- B. Source Limitations: Obtain pavement-marking paints from single source from single manufacturer.

2.2 PERFORMANCE REQUIREMENTS

- A. Retain this article if accessible pavement markings are required. Generally, retain only one of first two options in "Accessibility Standard" Paragraph below. Retain first option for facilities covered under the Americans with Disabilities Act (ADA) of 1990. Retain second for facilities covered under the Architectural Barriers Act (ABA). Retain last option for compliance with the IBC. Accessibility Standard: Comply with applicable provisions in [the USDOJ's "2010 ADA Standards for Accessible Design"] [and] [ICC A117.1] .
- B. PAVEMENT-MARKING PAINT
- C. Retain "Pavement-Marking Paint, Alkyd"; "Pavement-Marking Paint, Solvent-Borne"; "Pavement-Marking Paint, Acrylic"; or "Pavement-Marking Paint, Latex" Paragraph below. Verify availability with pavement-marking-paint manufacturers. In "Pavement-Marking Paint, Alkyd" Paragraph below, drying time of Type N is 15 to 30 minutes. Type F dries faster, in three to six minutes if heated to about 125 deg F (51.5 deg C). Type S dries slowest and should only be used where traffic cones can be in place for one hour or more. Alkyd-resin-type pavement paints exceed 150-g/L VOC limits imposed by the EPA for "traffic-marking coatings," but may meet 450-g/L VOC limits imposed by the EPA for "zone-marking coatings." Revise text if discontinued standard FS TT-P-115, cited by some manufacturers, is required. In "Pavement-Marking Paint, Acrylic" Paragraph below, revise type to Type I if anticipated weather conditions are sufficiently benign. See the Evaluations. Some formulations of waterborne emulsions are quick drying, and others less so; see manufacturer's literature. Pavement-Marking Paint, Acrylic: Acrylic, waterborne emulsion, lead and chromate free, ready mixed, complying with FS TT-P-1952F, Type II, with drying time of less than 45 minutes.
 - 1. Retain required color(s) in "Color" Subparagraph below. If more than one color is required, indicate locations of each on Drawings or by inserts. Color: White.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify that pavement-marking substrate is dry and in suitable condition to begin pavement marking in accordance with manufacturer's written instructions.
- B. Proceed with pavement marking only after unsatisfactory conditions have been corrected.

3.2 PAVEMENT MARKING

- A. Do not apply pavement-marking paint until layout, colors, and placement have been verified with Architect.
- B. Allow asphalt paving or concrete surfaces to age for a minimum of 30 for asphalt & 90 for concrete or manufacturer's specifications before starting pavement marking.
- C. Sweep and clean surface to eliminate loose material and dust.

- D. Apply paint with mechanical equipment to produce pavement markings, of dimensions indicated, with uniform, straight edges. Apply at manufacturer's recommended rates to provide a minimum wet film thickness of 15 mils.
 - 1. Apply graphic symbols and lettering with paint-resistant, die-cut stencils, firmly secured to asphalt paving or concrete surface. Mask an extended area beyond edges of each stencil to prevent paint application beyond stencil. Apply paint so that it cannot run beneath stencil.
 - 2. Broadcast glass beads uniformly into wet markings at a rate of 6 lb/gal. (0.72 kg/L).

3.3 PROTECTING AND CLEANING

- A. Protect pavement markings from damage and wear during remainder of construction period.
- B. Clean spillage and soiling from adjacent construction using cleaning agents and procedures recommended by manufacturer of affected construction.

END OF SECTION

SECTION 321800 – Athletic & Recreational Services

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Athletic and Recreational Surfacing of the following types:
 - 1. Rubberized, Poured-in-Place Surfacing. (FlexGround Standard, EnduraFlex, UltraFlex, Xtreme Play, FlexPlay, FlexBond, EnduraFlex with Xtreme Surfacing, Multicoat Acrylic Krete Kote)

1.2 RELATED SECTIONS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.
- B. Section 32 12 16 - Asphalt Paving (32 12 16) - Asphalt Paving.
- C. Section 03 30 00 - Cast-in-Place Concrete (03 30 00) - Cast-in-Place Concrete.
- D. Section 31 20 00 - Earth Moving (31 00 00) - Earthwork: grading, subgrade preparation.
- E. Section - (32 11 23) - Aggregate Base Courses: Subbase for resilient surfacing.

1.3 REFERENCES

- A. ASTM International (ASTM):
 - 1. ASTM B117 - Standard Practice for Operating Salt Spray, Fog, Apparatus.
 - 2. ASTM C67 - Standard Test Methods for Sampling and Testing Brick and Structural Clay Tile.
 - 3. ASTM C109 - Standard Test Method for Compressive Strength of Hydraulic Cement Mortars.
 - 4. ASTM C190 - Method of Test for Tensile Strength of Hydraulic Cement Mortars.
 - 5. ASTM C297 - Standard Test Method for Flatwise Tensile Strength of Sandwich Constructions.
 - 6. 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.
 - 7. ASTM D412 - Standard Test Methods for Vulcanized Rubber and Thermoplastic Rubbers and Thermoplastic Elastomers - Tension.
 - 8. ASTM D624 - Standard Test Method for Tear Strength of Conventional Vulcanized Rubber and Thermoplastic Elastomers.
 - 9. ASTM D790 - Standard Test Methods for Flexural Properties of Unreinforced and Reinforced Plastics and Electrical Insulating Materials.
 - 10. ASTM D1171 - Standard Test Method for Rubber Deterioration Surface Ozone Cracking Outdoors, Triangular Specimens.
 - 11. ASTM D1242 - Standard Test Methods for Resistance of Plastic Materials to Abrasion.
 - 12. ASTM D1418 - Standard Practice for Rubber and Rubber Latices Nomenclature.
 - 13. ASTM D2047 - Standard Test Method for Static Coefficient of Friction of Polish-Coated Flooring Surfaces as Measured by the James Machine.
 - 14. ASTM D2859 - Standard Test Method for Flammability of Finished Textile Floor Covering Materials.
 - 15. ASTM D4060 - Standard Test Method for Abrasion Resistance of Organic Coatings by the Taber Abraser.
 - 16. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials.
 - 17. ASTM E96 - Standard Test Methods for Water Vapor Transmission of Materials.
 - 18. ASTM E303 - Standard Test Method for Measuring Surface Frictional Properties Using the British Pendulum Tester.
 - 19. ASTM F1292 - Standard Specification for Impact Attenuation of Surface Systems Under and

- Around Playground Equipment.
- 20. ASTM F1951 - Standard Specification for Determination of Accessibility of Surface Systems Under and Around Playground Equipment.
- 21. ASTM G21 - Standard Practice for Determining Resistance of Synthetic Polymeric Materials to Fungi.
- 22. ASTM G23 - Standard Practice for Operating Light-Exposure Apparatus, Carbon-Arc Type, With and Without Water for Exposure of Nonmetallic Materials.

1.4 DEFINITIONS

- A. EPDM Granules: Ethylene propylene diene monomer or EPDM rubber, M-class, a type of synthetic rubber, is an elastomer characterized by a wide range of applications. The M refers to its classification in ASTM D1418; the M class includes rubbers having a saturated chain of the polyethylene type.
- B. Critical Fall Height: A critical fall height, CFH, is the maximum height of fall from play equipment to the ground. It is important to note that safety surfaces do not prevent injury but aim to lessen the severity of any injury that may occur on falls from height.
- C. Fall Height: Fall height is a measurement defined as the vertical distance between a designated play surface and the protective surfacing beneath it.
- D. TPV: Thermoplastic vulcanized elastomer, developed using resin and synthetic rubber with higher UV stabilization.
- E. SBR: Styrene-butadiene or styrene-butadiene rubber describes families of synthetic rubbers derived from styrene and butadiene.

1.5 SUBMITTALS

- A. Submit under provisions of Section 01 30 00 - Administrative Requirements.
- B. Product Data:
 - 1. Manufacturer's data sheets on each product to be used.
 - 2. Preparation instructions and recommendations.
 - 3. Storage and handling requirements and recommendations.
 - 4. Typical installation methods.
- C. Verification Samples: Two representative units of each type, size, pattern, and color.
- D. Shop Drawings: Include details of materials, construction, and finish. Include relationship with adjacent construction.

1.6 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section with a minimum five years documented experience.
 - 1. Comply with current ASTM F1292 Test Criteria.
- B. Installer Qualifications: Installed by Manufacturer.
- C. Source Limitations: Provide each type of product from a single manufacturing source to ensure uniformity.

1.7 PRE-INSTALLATION CONFERENCE

- A. Convene a conference approximately two weeks before scheduled commencement of the Work. Attendees shall include Architect, Contractor and trades involved. Agenda shall include schedule, responsibilities, critical path items and approvals.

1.8 DELIVERY, STORAGE, AND HANDLING

- A. Store and handle in strict compliance with manufacturer's written instructions and recommendations.
- B. Protect from damage due to weather, excessive temperature, and construction operations.

1.9 PROJECT CONDITIONS

- A. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's recommended limits.

1.10 WARRANTY

- A. Manufacturer's Warranty: Provide manufacturer's standard limited warranty.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Acceptable Manufacturer: FlexGround, LLC, which is located at:
2140 E. Cedar St.
Tempe, AZ 85281
Toll Free Tel: 888-571-1080
Tel: 602-954-0000
Email:[request info \(info@flexground.com\);](mailto:request info (info@flexground.com);) Web:<https://www.flexground.com/>
- B. Substitutions: Not permitted.
- C. Requests for substitutions will be considered in accordance with provisions of Section 01 60 00 - Product Requirements.

2.2 RUBBERIZED, POURED-IN-PLACE SURFACING

- A. Performance Requirements:
 - 1. Standards Compliance: ASTM D624, ASTM D2859, ASTM E303, ASTM F1292, ASTM F1951, ASTM C1028, and ASTM D412.
- B. Basis of Design: FlexGround Standard; as manufactured and supplied by FlexGround, LLC.
 - 1. Description: A dual durometer poured in place system with a wearing layer upper membrane and an underlying impact attenuation cushion layer. The finished surface shall be porous and capable of being installed at varying thickness to comply with the Critical Fall Height requirements of the playground equipment.
 - 2. Primer: 100 percent solids urethane primer and sealer, designed with low viscosity and penetrating abilities.
 - 3. Cushion Layer: Porous layer.
 - a. Material: Mixture of black recycled rubber and a 100 percent solids moisture cured aliphatic or aromatic polyurethane binder.
 - 1) Ratio: 100 pounds (45 kg) of rubberized cushion layer to 12 pounds (5.4 kg) of binder.
 - b. Material: 5/8 inch (16 mm) chunk rubber derived only from high quality pre-consumer recycled rubber containing EPDM. Cushion layer should be porous.
 - c. Thickness: As indicated on Drawings.
 - d. Thickness: As required for Critical Fall Height indicated.
 - e. Thickness: _____.
 - 4. Wearing Surface:
 - a. Material: 0.04 to 0.12 inches (1 to 3 mm) EPDM virgin colored rubber granules bonded by FLEXGROUND binder, 100 percent solids moisture cured aliphatic or aromatic

- polyurethane binder.
 - 1) Ratio: 110 pounds (50 kg) of EPDM to 22 pounds (10 kg) of binder.
 - b. Minimum Thickness: 1/2 inch (12.7 mm).
 - 5. Color: To be selected by Architect.
 - 6. Color: As indicated on Drawings.
 - 7. Color: _____.
- C. Basis of Design: EnduraFlex; as manufactured and supplied by FlexGround, LLC.
- 1. Description: A dual durometer poured in place system with a wearing layer upper membrane and an underlying impact attenuation cushion layer. The finished surface shall be porous and capable of being installed at varying thickness to comply with the Critical Fall Height requirements of the playground equipment.
 - 2. Primer: 100 percent solids urethane primer and sealer, designed with low viscosity and penetrating abilities.
 - 3. Cushion Layer: Porous layer.
 - a. Material: Mixture of black recycled rubber and a 100 percent solids moisture cured aliphatic or aromatic polyurethane binder.
 - 1) Ratio: 100 pounds (45 kg) of rubberized cushion layer to 12 pounds (5.4 kg) of binder.
 - b. Material: 5/8 inch (16 mm) chunk rubber derived only from high quality pre-consumer recycled rubber containing EPDM. Cushion layer should be porous.
 - c. Thickness: As indicated on Drawings.
 - d. Thickness: As required for Critical Fall Height indicated.
 - e. Thickness: _____.
 - 4. Wearing Surface:
 - a. Material: 0.04 to 0.16 inches (1 to 4 mm) TPV virgin colored rubber granules bonded by FLEXGROUND binder, 100 percent solids moisture cured aliphatic or aromatic polyurethane binder.
 - 1) Ratio: 110 pounds (50 kg) of TPV to 22 pounds (10 kg) of binder.
 - b. Minimum Thickness: 1/2 inch (12.7 mm).
 - 5. Color: To be selected by Architect.
 - 6. Color: As indicated on Drawings.
 - 7. Color: _____.
- D. Basis of Design: UltraFlex; as manufactured and supplied by FlexGround, LLC.
- 1. Description: A dual durometer poured in place system with a wearing layer upper membrane and an underlying impact attenuation cushion layer. The finished surface shall be porous and capable of being installed at varying thickness to comply with the Critical Fall Height requirements of the playground equipment.
 - 2. Primer: 100 percent solids urethane primer and sealer, designed with low viscosity and penetrating abilities.
 - 3. Cushion Layer: Porous layer.
 - a. Material: Mixture of black recycled rubber and a 100 percent solids moisture cured aliphatic or aromatic polyurethane binder.
 - 1) Ratio: 100 pounds (45 kg) of rubberized cushion layer to 12 pounds (5.4 kg) of binder.
 - b. Material: 5/8 inch (16 mm) chunk rubber derived only from high quality pre-consumer recycled rubber containing EPDM. Cushion layer should be porous.
 - c. Thickness: As indicated on Drawings.
 - d. Thickness: As required for Critical Fall Height indicated.
 - e. Thickness: _____.
 - 4. Wearing Surface:
 - a. Material: 0.02 inches (0.5 mm) TPV or EPDM virgin colored rubber granules bonded by FLEXGROUND binder, 100 percent solids moisture cured aliphatic or aromatic polyurethane binder.
 - 1) Ratio: 110 pounds (50 kg) of EPDM to 24.2 pounds (11 kg) of binder.

- b. Minimum Thickness: 1/2 inch (12.7 mm).
 5. Color: To be selected by Architect.
 6. Color: As indicated on Drawings.
 7. Color: _____.
- E. Basis of Design: FlexGround Xtreme Play; as manufactured and supplied by FlexGround, LLC.
 1. Description: A dual durometer poured in place system with a grouted and sealed wearing layer upper membrane and an underlying impact attenuation cushion layer. The finished surface shall be non-porous and capable of being installed at varying thickness to comply with the Critical Fall Height requirements of the playground equipment.
 2. Primer: 100 percent solids urethane primer and sealer, designed with low viscosity and penetrating abilities.
 3. Cushion Layer: Porous layer.
 - a. Material: Mixture of black recycled SBR rubber buffings and a 100 percent solids moisture cured MDI polyurethane binder.
 - 1) Ratio: 100 pounds (45 kg) of rubberized cushion layer to 12 pounds (5.4 kg) of binder.
 - b. Material: 5/8 inch (16 mm) chunk rubber derived only from high quality pre-consumer recycled rubber containing EPDM. Cushion layer should be porous.
 - c. Thickness: As indicated on Drawings.
 - d. Thickness: As required for Critical Fall Height indicated.
 - e. Thickness: _____.
 4. Wearing Surface:
 - a. Material: TPV or EPDM virgin color rubber granules mixed with an aromatic or aliphatic urethane binder.
 - 1) Ratio: 110 pounds (50 kg) of TPV or EPDM to 22 pounds (10 kg) of binder.
 5. Grout: Thixotropic thermoplastic paste applied at 1 gallon (3.8 L) per 30 square feet (2.78 square meters) over wear course layer rendering it non-porous.
 - a. Coefficient of Friction, ASTM D2047: 0.588 dry, 0.817 wet.
 - b. Tensile Strength, ASTM D412: 163 psi (1124 kPa), 133 psi (917 kPa) when chlorine soaked.
 - c. Tensile Elongation, ASTM D412: 132.2 percent, 112 when chlorine soaked.
 - d. Tear Strength, ASTM D624: 75.74 pounds (34.36 kg), 70.03 pounds (31.77 kg) when chlorine soaked.
 6. Primer coat: Urethane primer with tinting color packs) One coat at spread rate of 200 sq ft per gallon. 1 color pack per 5 gallons of primer.
 7. Color Seal: Water-based composite color seal applied (2 coat) at 300 square feet (27.9 square meters) per gallon per coat (3.8 L) and spread evenly to cover the entire surface. Slip resistance materials may be added on second coat.
 8. Color: To be selected by Architect.
 9. Color: As indicated on Drawings.
 10. Color: _____.
- F. Basis of Design: FlexPlay; as manufactured and supplied by FlexGround, LLC.
 1. Description: Playground mounds added to play surface. Capable of being placed in fall zone areas.
 2. Mound Configuration:
 - a. Height: As indicated on Drawings.
 - b. Height: _____.
 - c. Diameter: As indicated on Drawings.
 - d. Diameter: _____.
 3. Tunnel Configuration:
 - a. Length: As indicated on Drawings.
 - b. Length: _____.
 - c. Diameter: As indicated on Drawings.
 - d. Diameter: _____.

4. Color: To be selected by Architect.
 5. Color: As indicated on Drawings.
 6. Color: _____.
- G. Basis of Design: FlexBond; as manufactured and supplied by FlexGround, LLC.
1. Description: A poured in place single-layer. The finished surface shall be porous and capable of being installed at varying thickness to comply with the Critical Fall Height requirements of the playground equipment.
 2. Leveling and Patching Material: Portland cement-based grout or epoxy- or polyurethane-based formulation suitable for exterior use and approved by surfacing manufacturer.
 3. Primer: 100 percent solids urethane primer and sealer, designed with low viscosity and penetrating abilities.
 4. High wear areas such as under swings and slides require a TPV 1/2:" insert.
 5. Surfacing: Porous layer.
 - a. Material: 100 percent post-consumer waste tire containing no metal or lead.
 - 1) SBR Rubber: +4 SBR mulch buffings.
 - a) Sieve, 0.49 inch (12.5 mm): 0 percent.
 - b) Sieve, 20: 98 to 100 percent.
 - c) Pan: 0 to 2 percent.
 - b. Rubber to Urethane Ratio: 20 percent.
 - c. Thickness: 2 inches (51 mm).
 - d. Thickness: As indicated on Drawings.
 - e. Thickness: As required for Critical Fall Height indicated.
 - f. Thickness: _____.
 6. Color: To be selected by Architect.
 7. Minimal fluff off (granulation) is to be expected.
 8. Color: As indicated on Drawings.
 9. Color: _____.
- H. Basis of Design: EnduraFlex with Xtreme Surfacing; as manufactured and supplied by FlexGround, LLC.
1. Description: A dual durometer poured in place system with a wearing layer upper membrane, grouted and sealed in designated high-wear areas, and an underlying impact attenuation cushion layer. The finished surface shall be porous and capable of being installed at varying thickness to comply with the Critical Fall Height requirements of the playground equipment.
 2. Primer: 100 percent solids urethane primer and sealer, designed with low viscosity and penetrating abilities.
 3. Cushion Layer: Porous layer.
 - a. Material: Mixture of black recycled rubber and a 100 percent solids moisture cured aliphatic or aromatic polyurethane binder.
 - 1) Ratio: 100 pounds (45 kg) of rubberized cushion layer to 12 pounds (5.4 kg) of binder.
 - b. Material: 5/8 inch (16 mm) chunk rubber derived only from high quality pre-consumer recycled rubber containing EPDM. Cushion layer should be porous.
 - c. Thickness: As indicated on Drawings.
 - d. Thickness: As required for Critical Fall Height indicated.
 - e. Thickness: _____.
 4. Wearing Surface:
 - a. Material: TPV virgin colored rubber granules bonded mixed with a 100 percent solids moisture cured MDI polyurethane binder.
 - 1) Ratio: 100 pounds (45 kg) of rubberized cushion layer to 12 pounds (5.4 kg) of binder.
 5. Grout: Thixotropic thermoplastic paste applied at 1 gallon (3.8 L) per 30 square feet (2.78 square meters) over wear course layer rendering it non-porous.
 - a. Coefficient of Friction, ASTM D2047: 0.588 dry, 0.817 wet.
 - b. Tensile Strength, ASTM D412: 163 psi (1124 kPa), 133 psi (917 kPa) when chlorine

- soaked.
- c. Tensile Elongation, ASTM D412: 132.2 percent, 112 when chlorine soaked.
- d. Tear Strength, ASTM D624: 75.74 pounds (34.36 kg), 70.03 pounds (31.77 kg) when chlorine soaked.
- 6. Primer coat: Urethane primer with tinting color packs) One coat at spread rate of 200 sq ft per gallon. 1 color pack per 5 gallons of primer.
- 7. Color Seal: Water-based composite color seal applied (2 coat) at 300 square feet (27.9 square meters) per gallon per coat (3.8 L) and spread evenly to cover the entire surface.
- 8. Color: To be selected by Architect.
- 9. Color: As indicated on Drawings.
- 10. Color: _____.
- I. Basis of Design: Multicoat Acrylic Krete Kote; as supplied by FlexGround, LLC.
 - 1. Description: Super bonding, flexible synthetic resin modified cementitious coating which forms a durable, anti-skid, weather, and chemical resistant surface over properly prepared substrates.
 - 2. Properties:
 - a. Weatherometer, ASTM G23: 2000 hrs. - Passed.
 - b. Compressive Strength, ASTM C109: 2595 psi at 45 days air cured.
 - c. Flexural Strength - Modulus of Rupture, ASTM D790: 770psi.
 - d. Tensile Strength, ASTM C190: 457 psi.
 - e. Bond Strength - Flatwise Tension, ASTM C297: 225 psi.
 - f. Abrasion Test, ASTM D1242: 39 mil loss 1000cyc-1000gms
 - g. Salt Spray - 300 hours, ASTM B117: Passed.
 - h. Water Vapor Transmission, ASTM E96: 8.5 Perms.
 - i. Freeze Thaw 50-Cycle, ASTM C67: Passed.
 - j. Impact Resistance, MIL-D-3134F: Passed.
 - k. Flame Spread, ASTM E84: Class A.
 - 3. Accessory Materials:
 - a. Color Sealer: Acrathane ColorSeal, a series of high quality water based modified resins that provide a high quality, durable seal on masonry, cementitious, and other building substrates. Colors are factory blended to insure uniformity.
 - b. Clear Sealer: Multicoat Acrathane ClearSeal, a water base material.
 - c. Concrete Repair: Multicoat Speed Mix 2000, a fast setting, resin modified, hydraulic cement. Used by itself for most types of concrete repair such as leveling, filling cavities and cracks. Can be used interior or exterior, vertical, horizontal, or overhead.
 - d. Crack Repair: Multicoat Speed Bond Crack Repair System, a unique two component water based polyurethane material. Used to repair cracks, holes, and depressions prior to the application of various Multicoat Systems.
 - e. Water: Potable.

2.3 SURFACE REPAIR AND MAINTENANCE

- A. Basis of Design: FlexGrout; as manufactured and supplied by FlexGround, LLC.
 - 1. Description: A poured in place grout system with a penetrating membrane.
 - 2. Material: Thixotropic thermoplastic paste applied over wear course layer rendering it non-porous.
 - a. Spread Rate: 30 square feet (2.78 square meters) per gallon (3.8 L).
 - b. Spread Rate: _____.
 - c. Coefficient of Friction, ASTM D2047: 0.588 dry, 0.817 wet.
 - d. Tensile Strength, ASTM D412: 163 psi (1124 kPa), 133 psi (917 kPa) when chlorine soaked.
 - e. Tensile Elongation, ASTM D412: 132.2 percent, 112 when chlorine soaked.
 - f. Tear Strength, ASTM D624: 75.74 pounds (34.36 kg), 70.03 pounds (31.77 kg) when chlorine soaked.
 - 3. Primer coat: Urethane primer with tinting color packs) One coat at spread rate of 200 sq ft per

- gallon. 1 color pack per 5 gallons of primer.
4. Color Seal: Water-based composite color seal applied (2 coats) at 300 square feet (27.9 square meters) per gallon per coat (3.8 L) and spread evenly to cover the entire surface.
 5. Color: To be selected by Architect.
 6. Color: As indicated on Drawings.
 7. Color: _____.
- B. Basis of Design: FlexCoat; as manufactured and supplied by FlexGround, LLC.
1. Description: Aliphatic urethane coating designed to be low viscosity for optimal penetrating abilities and prevents premature granulation.
 2. Uses: Rebinds the rubber granules, improving the useful life of rubber safety surfacing and rejuvenates surface color.
- C. Basis of Design: FlexFix; as manufactured and supplied by FlexGround, LLC.
1. Description: Quickly and easily repairs minor and major damage. Cuts are made at 45 degrees.
- D. Basis of Design: FlexTop; as manufactured and supplied by FlexGround, LLC.
1. Performance Requirements: Meets or exceeds ASTM F1292 for impact attenuation.
 2. Description: A dual durometer poured in place system with a wearing layer upper membrane and an underlying impact attenuation cushion layer.
 3. Primer: 100 percent solids urethane primer and sealer, designed with low viscosity and penetrating abilities.
 4. Cushion Layer: Porous layer.
 - a. Material: Mixture of recycled rubber and a 100 percent solids moisture cured MDI polyurethane binder with correct amount of urethane for impact attenuation and longevity.
 - b. Material: 5/8 inch (16 mm) chunk rubber derived only from high quality pre-consumer recycled rubber containing EPDM. Cushion layer should be porous.
 5. Wearing Surface:
 - a. Material: 0.04 to 0.12 inches (1 to 3 mm) virgin peroxide cured EPDM rubber granules, or 0.04 to 0.16 inches (1 to 4 mm) TPV virgin colored rubber mixed with 100 percent solids moisture cured polyurethane binder.
 - 1) Ratio: 110 pounds (50 kg) of EPDM or TPV to 22 pounds (10 kg) of binder.
 - b. Minimum Thickness: 1/2 inch (12.7 mm).
 6. Color: To be selected by Architect.
 7. Color: As indicated on Drawings.
 8. Color: _____.
- E. Basis of Design: FlexTop with Xtreme; as manufactured and supplied by FlexGround, LLC.
1. Performance Requirements: Meets or exceeds ASTM F1292 for impact attenuation.
 2. Description: A dual durometer poured in place system with a wearing layer upper membrane, grouted and sealed in designated high-wear areas, and an underlying impact attenuation cushion layer.
 3. Primer: 100 percent solids urethane primer and sealer, designed with low viscosity and penetrating abilities.
 4. Cushion Layer: Porous layer.
 - a. Material: Mixture of black recycled SBR rubber buffings and a 100 percent solids moisture cured MDI polyurethane binder.
 - 1) Ratio: 100 pounds (45 kg) of rubberized cushion layer to 12 pounds (5.4 kg) of binder.
 - b. Material: 5/8 inch (16 mm) chunk rubber derived only from high quality pre-consumer recycled rubber containing EPDM. Cushion layer should be porous.
 5. Wearing Surface:
 - a. Material: TPV virgin colored rubber mixed with an aromatic or aliphatic cured urethane binder.
 - 1) Ratio: 110 pounds (50 kg) of TPV to 22 pounds (10 kg) of binder.

- b. Minimum Thickness: 1/2 inch (12.7 mm).
- 6. Grout: Thixotropic thermoplastic paste applied at 1 gallon (3.8 L) per 30 square feet (2.78 square meters) over wear course in designated high-wear areas.
 - a. Coefficient of Friction, ASTM D2047: 0.588 dry, 0.817 wet.
 - b. Tensile Strength, ASTM D412: 163 psi (1124 kPa), 133 psi (917 kPa) when chlorine soaked.
 - c. Tensile Elongation, ASTM D412: 132.2 percent, 112 when chlorine soaked.
 - d. Tear Strength, ASTM D624: 75.74 pounds (34.36 kg), 70.03 pounds (31.77 kg) when chlorine soaked.
- 7. Primer coat: Urethane primer with tinting color packs) One coat at spread rate of 200 sq ft per gallon. 1 color pack per 5 gallons of primer.
- 8. Color Seal: Water-based composite color seal applied (2 coats) at 300.3 square feet (27.9 square meters) per gallon per coat (3.8 L) and spread evenly to cover the entire surface.
- 9. Color: To be selected by Architect.
- 10. Color: As indicated on Drawings.
- 11. Color: _____.

2.4 ATHLETICS SURFACING

- A. Basis of Design: CourtScapes; as manufactured and supplied by FlexGround, LLC. This product is ITF (International Tennis Federation) certified.
 - 1. Description: A single-pour poured in place system. The finished surface shall be porous and capable of being installed at varying thickness.
 - 2. Primer: 100 percent solids urethane primer and sealer, designed with low viscosity and penetrating abilities.
 - 3. Single Pour Layer:
 - a. Material: Mixture of 3/8 inch (9.5 mm) pea gravel, TPV, or EPDM colored rubber granules, black SBR rubber granules, and a 100 percent solids moisture cured aliphatic or aromatic polyurethane binder.
 - 1) Ratio: 100 pounds (45 kg) of pea gravel, 55 pounds (25 kg) of colored rubber granules, 55 pounds (25 kg) of black SBR rubber granules, and 31.5 pounds (14.3 kg) of binder.
 - b. Surface Prep: Prep surface as required by manufacture.
 - c. Thickness: As indicated on Drawings.
 - d. Thickness: Minimum 1/2 inch (13 mm).
 - 4. Color: To be selected by Architect.
 - 5. Color: As indicated on Drawings.
 - 6. Color: _____.
- B. Basis of Design: SportFlex Standard; as supplied by FlexGround, LLC.
 - 1. Concrete Primer: Two-component, 100 percent solids, solvent-free epoxy primer.
 - a. Percent Solids by Weight: Minimum 98 percent.
 - b. Weight: 9.01 pounds (4.09 kg) per gallon (3.8 L).
 - 2. Acrylic Resurfacer: Acrylic-based emulsion used for smoothing rough pavements.
 - a. Coats: 1 coat.
 - b. Coats: 2 coats.
 - c. Percent Solids by Weight: Minimum 52 percent.
 - d. Weight: 10.68 pounds (4.84 kg) per gallon (3.8 L).
 - 3. ColorCoat Concentrate Textured Batch Mixture: Pigmented wear-resistant acrylic emulsion.
 - a. Coats: 2 coats.
 - b. Percent Solids by Weight: Minimum 49 percent.
 - c. Weight: 12.9 pounds (5.85 kg) per gallon (3.8 L).
 - d. Color: To be selected by Architect.
 - e. Color: As indicated on Drawings.
 - f. Color: _____.
 - 4. ColorCoat Concentrate Finish Batch Mixture: Pigmented wear-resistant acrylic emulsion.

- a. Coats: 1 coat.
 - b. Percent Solids by Weight: Minimum 49 percent.
 - c. Weight: 9.47 to 9.52 pounds (4.30 to 4.32 kg) per gallon (3.8 L).
 - d. Color: To be selected by Architect.
 - e. Color: As indicated on Drawings.
 - f. Color: _____.
- 5. SportFlex Line Prime: Clear drying acrylic emulsion line primer.
 - a. Coats: 1 coat.
 - b. Percent Solids by Weight: 29 percent.
 - c. Weight: 8.9 pounds (4.04 kg) per gallon (3.8 L).
- 6. SportFlex Textured White Line Paint: Factory textured, wear-resistant acrylic emulsion line marking paint.
 - a. Coats: 1 coat.
 - b. Coats: 2 coats.
 - c. Percent Solids by Weight: 67 percent.
 - d. Weight: 11.4 pounds (5.17 kg) per gallon (3.8 L).
- C. Basis of Design: SportFlex Plus; as supplied by FlexGround, LLC.
 - 1. Crack Repair: Super bonding cementitious compound.
 - 2. Acrylic Resurfacer: Acrylic-based emulsion used for smoothing rough pavements.
 - a. Coats: 1 coat.
 - b. Coats: 2 coats.
 - c. Percent Solids by Weight: Minimum 52 percent.
 - d. Weight: 10.68 pounds (4.84 kg) per gallon (3.8 L).
 - 3. ColorCoat Concentrate Textured Batch Mixture: Pigmented wear-resistant acrylic emulsion.
 - a. Coats: 2 coats.
 - b. Percent Solids by Weight: Minimum 49 percent.
 - c. Weight: 12.9 pounds (5.85 kg) per gallon (3.8 L).
- D. Basis of Design: SportFlex Ultra; as manufactured and supplied by FlexGround, LLC.
 - 1. Crack Repair: Super bonding cementitious compound.
 - 2. Surface Layer: 1/2 to 3/4 inch (13 to 19 mm) layer of TPV or EPDM colored granules, hand troweled over prepared surface with aromatic or aliphatic urethane.
 - a. Color: To be selected by Architect.
 - b. Color: As indicated on Drawings.
 - c. Color: _____.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Do not begin installation until substrates have been properly constructed and prepared.
- B. If substrate preparation is the responsibility of another installer, notify Architect in writing of unsatisfactory preparation before proceeding.

3.2 PREPARATION

- A. Clean surfaces thoroughly prior to installation.
- B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

3.3 INSTALLATION

- A. Install in accordance with manufacturer's instructions, approved submittals, and in proper relationship with adjacent construction.

1. Install in thickness and layers indicated.

3.4 FIELD QUALITY CONTROL

- A. Field Inspection: Coordinate field inspection in accordance with appropriate sections in Division 01.
- B. Manufacturer's Services: Coordinate manufacturer's services in accordance with appropriate sections in Division 01.

3.5 CLEANING AND PROTECTION

- A. Clean products in accordance with the manufacturer's recommendations.
- B. Touch-up, repair or replace damaged products before Substantial Completion.

END OF SECTION

SECTION 323113 - CHAIN LINK FENCES AND GATES

PART 1 - INTRODUCTION

The City of Pooler, a municipality within the State of Georgia, is requesting proposals for 900 s Rogers St. This Request for Proposal (RFP) outlines the requirements and instructions for submitting a proposal for the project, the evaluation process, and the terms and conditions of the potential contract.

PART 2 - GENERAL

2.1 RELATED DOCUMENTS

Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

2.2 SUMMARY

A. Section Includes:

Chain-link fences.

1. Swing gates.
2. Privacy slats.

B. Related Requirements:

Section 033000 "Cast-in-Place Concrete "for cast-in-place.

1. Section 281500 "Access Control Hardware Devices" for gate controls.

2.3 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Pooler Basketball Courts, 900 S rogers Street, Pooler, GA

Inspect and discuss electrical roughing-in, equipment bases, and other preparatory work specified elsewhere.

1. Review coordination of interlocked equipment specified in this Section and elsewhere.
2. Review required testing, inspecting, and certifying procedures.

2.4 ACTION SUBMITTALS

A. Product Data: For each type of product.

Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for the following:

- a. Fence and gate posts, rails, and fittings.
- b. Chain-link fabric, reinforcements, and attachments.
- c. Gates and hardware.

d. Gate operators, including operating instructions and motor characteristics.

B. Shop Drawings: For each type of fence and gate assembly.

Include plans, elevations, sections, details, and attachments to other work.

1. Include accessories, hardware, gate operation, and operational clearances.
2. Wiring Diagrams: For power, signal, and control wiring.

C. Samples for Initial Selection: For each type of factory-applied finish.

D. Samples for Verification: For each type of component with factory-applied finish, prepared on Samples of size indicated below:

Polymer-Coated Components: In 6-inch lengths for components and on full-sized units for accessories.

E. Delegated-Design Submittal: For structural performance of chain-link fence and gate frameworks, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

2.5 INFORMATIONAL SUBMITTALS

A. Qualification Data: For qualified testing agency.

B. Product Certificates: For each type of chain-link fence and gate.

C. Product Test Reports: For framework strength according to ASTM F 1043, for tests performed by a qualified testing agency.

D. Field quality-control reports.

E. Sample Warranty: For special warranty.

2.6 CLOSEOUT SUBMITTALS

A. Operation and Maintenance Data:

2.7 QUALITY ASSURANCE

A. Testing Agency Qualifications: For testing fence grounding; member company of NETA or an NRTL.

Testing Agency's Field Supervisor: Certified by NETA to supervise on-site testing.

B. Mockups: Build mockups to set quality standards for fabrication and installation.

Build mockup for typical chain-link fence and gate, including accessories.

a. Size: 10-foot of fence.

2.8 FIELD CONDITIONS

- A. Field Measurements: Verify layout information for chain-link fences and gates shown on Drawings in relation to property surveys and existing structures. Verify dimensions by field measurements.

2.9 WARRANTY

- A. Special Warranty: Installer agrees to repair or replace components of chain-link fences and gates that fail in materials or workmanship within specified warranty period.

Failures include, but are not limited to, the following:

- a. Failure to comply with performance requirements.
- b. Deterioration of metals, metal finishes, and other materials beyond normal weathering.
- c. Faulty operation of gate operators and controls.

Warranty Period: 3 years from date of Substantial Completion.

PART 3 - PRODUCTS

3.1 PERFORMANCE REQUIREMENTS

- A. Delegated Design: Engage a qualified professional engineer, as defined in Section 014000 "Quality Requirements," to design chain-link fence and gate frameworks.
- B. Structural Performance: Chain-link fence and gate frameworks shall withstand the design wind loads and stresses for fence height(s) and under exposure conditions indicated according to ASCE/SEI 7.

Design Wind Load:

- a. Minimum Post Size: Determine according to ASTM F 1043 for post spacing not to exceed 10 feet for Material Group IA, ASTM F 1043, Schedule 40 steel pipe Group IC, electric-resistance-welded round steel pipe.
- b. Minimum Post Size and Maximum Spacing: Determine according to CLFMI WLG 2445, based on mesh size and pattern specified.

3.2 FENCE FRAMEWORK

- A. Posts and Rails: ASTM F 1043 for framework, including rails, braces, and line; terminal; and corner posts. Provide members with minimum dimensions and wall thickness according to ASTM F 1043 or ASTM F 1083 based on the following:

Fence Height: 120"

Heavy-Industrial-Strength Material: Group IA, round steel pipe, Schedule 40.

- a. Line Post: 6.625 inches in diameter.
- b. End, Corner, and Pull Posts: 6.625 inches in diameter.

Horizontal Framework Members: Intermediate, top, and bottom rails according to ASTM F 1043.

- c. Top Rail: 1.66 inches in diameter 1.25 by 1.63 inches

Brace Rails: ASTM F 1043.

Polymer coating over metallic coating.

- d. Color: Black, according to ASTM F 934.

3.3 TENSION WIRE

- A. Polymer-Coated Steel Wire: 0.177-inch-diameter, tension wire according to ASTM F 1664, Class 2b over Zn-5-Al-MM-alloy-coated steel wire.
- B. Color: Black, according to ASTM F 934.
- C. Aluminum Wire: 0.192-inch- diameter tension wire, mill finished, according to ASTM B 211, Alloy 6061-T94 with 50,000-psi minimum tensile strength.

3.4 SWING GATES

- A. General: ASTM F 900 for gate posts and single double swing gate types.

Gate Leaf Width: As indicated.

- B. Pipe and Tubing:

Zinc-Coated Steel: ASTM F 1043 and ASTM F 1083; protective coating and finish to match fence framework.

1. Aluminum: ASTM B 429/B 429M;black finish.
2. Gate Posts: Round tubular aluminum.
3. Gate Frames and Bracing: Round tubular aluminum

- C. Frame Corner Construction: Welded or assembled with corner fittings.

- D. Extended Gate Posts and Frame Members: Fabricate gate posts and frame end members to extend 12 inches above top of chain-link fabric at both ends of gate frame to attach barbed wire assemblies.

- E. Hardware:

Hinges: 360-degree inward and outward swing.

1. Latch: Permitting operation from both sides of gate with provision for padlocking accessible from both sides of gate.
2. Lock: Manufacturer's standard internal device.
3. Padlock and Chain:
4. Closer: Manufacturer's standard.

3.5 HORIZONTAL-SLIDE GATES

- A. General: ASTM F 1184 for gate posts and single double sliding gate types.

Classification: Type I Overhead Slide.

- a. Gate Leaf Width: As indicated.
- b. Framework Member Sizes and Strength: Based on gate fabric height of more than 72 inches as indicated.

Classification: Type II Cantilever Slide, Class 1 with external or Class 2 with internal roller assemblies.

- c. Gate Frame Width and Height: As indicated.

B. Pipe and Tubing:

Zinc-Coated Steel: Protective coating and finish to match fence framework

- 1. Aluminum: ASTM B 429/B 429M; mill manufacturer's standard finish.
- 2. Gate Posts: ASTM F 1184. Provide round tubular aluminum posts.
- 3. Gate Frames and Bracing: Round tubular aluminum.

C. Frame Corner Construction: Welded or assembled with corner fittings.

D. Overhead Track Assembly: Manufacturer's standard track, with overhead framework supports, bracing, and accessories, engineered to support size, weight, width, operation, and design of gate and roller assemblies.

E. Hardware:

Hangers, Roller Assemblies, and Stops: Fabricated from mill-finished Grade 319 aluminum-alloy casting with stainless-steel fasteners.

- 1. Latch: Permitting operation from both sides of gate with provision for padlocking accessible from both sides of gate.
- 2. Lock: Manufacturer's standard.
- 3. Padlock and Chain: Heavy-duty, weather-resistant padlock with galvanized steel chain.

3.6 FITTINGS

A. Provide fittings according to ASTM F 626, to match black fence.

B. Post Caps: Provide for each post.

Provide line post caps with loop to receive tension wire or top rail.

C. Rail and Brace Ends: For each gate, corner, pull, and end post.

D. Rail Fittings: Provide the following:

Top Rail Sleeves: not less than 6 inches long.

- 1. Rail Clamps: Line and corner boulevard clamps for connecting rails to posts.

E. Tension and Brace Bands: Aluminum Alloy 6063.

F. Tension Bars: Aluminum length is not less than 2 inches shorter than full height of chain-link fabric. Provide one bar for each gate and end post, and two for each corner and pull post, unless fabric is integrally woven into post.

G. Truss Rod Assemblies: Mill-finished aluminum rod and turnbuckle or other means of adjustment.

- H. Barbed Wire Arms: Aluminum, with clips, slots, or other means for attaching strands of barbed wire, and means for attaching to posts, integral with post cap, for each post unless otherwise indicated, and as follows:

Provide line posts with arms that accommodate top rail or tension wire.

1. Provide corner arms at fence corner posts unless extended posts are indicated.
2. Single-Arm Type: Type I, slanted arm or Type II, vertical arm.
3. Double-Arm Type: Type III, V-shaped arm or Type IV, A-shaped arm.

- I. Tie Wires, Clips, and Fasteners: According to ASTM F 626.

Standard Round Wire Ties: For attaching chain-link fabric to posts, rails, and frames, according to the following:

- a. Hot-Dip Galvanized Steel: 0.106-inch- 0.148-inch- diameter wire; galvanized coating thickness matching coating thickness of chain-link fence fabric.
- b. Aluminum: ASTM B 211; Alloy 1350-H19; 0.148-inch- 0.192-inch- diameter, mill-finished wire.

- J. Finish:

Metallic Coating for Pressed Steel or Cast Iron: Not less than 1.2 oz./sq. ft. of zinc.

- a. Polymer coating over metallic coating.

Aluminum: Mill finish.

- K. Controls: Electric controls separated from gate and motor and drive mechanism, with NEMA 250, Type 4 enclosure for surface pedestal mounting and with space for additional optional equipment. Enclosure shall have a black powder-coated finish.

3.7 GROUT AND ANCHORING CEMENT

- A. Nonshrink, Nonmetallic Grout: Factory-packaged, nonstaining, noncorrosive, nongaseous grout complying with ASTM C 1107/C 1107M. Provide grout, recommended in writing by manufacturer, for exterior applications.
- B. Anchoring Cement: Factory-packaged, nonshrink, nonstaining, hydraulic-controlled expansion cement formulation for mixing with water at Project site to create pourable anchoring, patching, and grouting compound. Provide formulation that is resistant to erosion from water exposure without needing protection by a sealer or waterproof coating, and that is recommended in writing by manufacturer for exterior applications.

PART 4 - EXECUTION

4.1 EXAMINATION

- A. Examine areas and conditions, with Installer present, for compliance with requirements for a certified survey of property lines and legal boundaries, site clearing, earthwork, pavement work, and other conditions affecting performance of the Work.

Do not begin installation before final grading is completed unless otherwise permitted by Architect.

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

4.2 PREPARATION

- A. Stake locations of fence lines, gates, and terminal posts. Do not exceed intervals of 500 feet or line of sight between stakes. Indicate locations of utilities, lawn sprinkler system, underground structures, benchmarks, and property monuments.

4.3 CHAIN-LINK FENCE INSTALLATION

- A. Install chain-link fencing according to ASTM F 567 and more stringent requirements specified.

Install fencing on established boundary lines inside property line.

- B. Post Excavation: Drill or hand-excavate holes for posts to diameters and spacings indicated, in firm, undisturbed soil.
- C. Post Setting: Set posts in concrete with mechanical anchors by mechanically driving into soil at indicated spacing into firm, undisturbed soil.

Verify that posts are set plumb, aligned, and at correct height and spacing, and hold in position during setting with concrete or mechanical devices.

1. Concrete Fill: Place concrete around posts to dimensions indicated and vibrate or tamp for consolidation. Protect aboveground portion of posts from concrete splatter.
 - a. Concealed Concrete: Place top of concrete 2 inches as indicated on Drawings to allow covering with surface material.

Mechanically Driven Posts: Drive into soil to depth of 30 inches 36 inches. Protect post top to prevent distortion.

- D. Terminal Posts: Install terminal end, corner, and gate posts according to ASTM F 567 and terminal pull posts at changes in horizontal or vertical alignment of as indicated on Drawings. For runs exceeding 500 feet, space pull posts an equal distance between corner or end posts.
- E. Line Posts: Space line posts uniformly at 96 inches or 10 feet o.c.
- F. Post Bracing and Intermediate Rails: Install according to ASTM F 567, maintaining plumb position and alignment of fence posts. Diagonally brace terminal posts to adjacent line posts with truss rods and turnbuckles. Install braces at end and gate posts and at both sides of corner and pull posts.
- G. Tension Wire: Install according to ASTM F 567, maintaining plumb position and alignment of fence posts. Pull wire taut, without sags. Fasten fabric to tension wire with 0.120-inch- diameter hog rings of same material and finish as fabric wire, spaced a maximum of 24 inches o.c. Install tension wire in locations indicated before stretching fabric. Provide horizontal tension wire at the following locations:

Extended along top and bottom of fence fabric. Install top tension wire through post cap loops. Install bottom tension wire within 6 inches of bottom of fabric and tie to each post with not less than same diameter and type of wire.

1. Extended along top of extended posts and top of fence fabric to support barbed tape.
2. As indicated on Drawings

- H. Top Rail: Install according to ASTM F 567, maintaining plumb position and alignment of fence posts. 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 in writing by fencing manufacturer.
- I. Intermediate and Bottom Rails: Secure to posts with fittings.
- J. Tension or Stretcher Bars: Thread through fabric and secure to end, corner, pull, and gate posts, with tension bands spaced not more than 15 inches o.c.
- K. 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 according to ASTM F 626. Bend ends of wire to minimize hazard to individuals and clothing.

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

- L. Fasteners: Install nuts for tension bands and carriage bolts on the side of fence opposite the fabric side. Peen ends of bolts or score threads to prevent removal of nuts.

4.4 GATE INSTALLATION

- A. Install gates according to manufacturer's written instructions, level, plumb, and secure for full opening without interference. Attach fabric as for fencing. Attach hardware using tamper-resistant or concealed means. Install ground-set items in concrete for anchorage. Adjust hardware for smooth operation.

4.5 GATE-OPERATOR INSTALLATION

- A. Install gate operators according to manufacturer's written instructions, aligned and true to fence line and grade.
- B. Excavation: Hand-excavate holes for posts, pedestals, and equipment bases/pads, in firm, undisturbed soil to dimensions and depths and at locations according to gate-operator component manufacturer's written instructions and as indicated.

4.6 FIELD QUALITY CONTROL

- A. Testing Agency: Owner will engage a qualified testing agency to perform tests.
- B. Grounding Tests: Comply with requirements in Section 264113 "Lightning Protection for Structures."
- C. Prepare test reports.

4.7 ADJUSTING

- A. Gates: Adjust gates to operate smoothly, easily, and quietly, free of binding, warp, excessive deflection, distortion, nonalignment, misplacement, disruption, or malfunction, throughout entire operational range. Confirm that latches and locks engage accurately and securely without forcing or binding.
- B. Lubricate hardware and other moving parts.

4.8 DEMONSTRATION

- A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain chain-link fences and gates.

END OF SECTION