



PURCHASING DEPARTMENT

REQUEST FOR BIDS

RFB 25-13

VARIOUS STORMWATER IMPROVEMENTS CONSTRUCTION

PROJECT SITES:

**MAYFIELD REGIONAL DETENTION, REGIONAL PARK DREDGING AND
STABILIZATION, & COOK DRIVE POND IMPROVEMENTS**

ISSUED: WEDNESDAY, AUGUST 13, 2025

MANDATORY PRE-BID MEETING:

THURSDAY, AUGUST 21, 2025, 10:00 AM

219 ALFORD STREET

ATHENS, TN 37303

BIDS DUE:

WEDNESDAY, SEPTEMBER 3, 2025, 3:00 PM

ATHENS CITY HALL

815 NORTH JACKSON STREET

ATHENS, TN 37303

TERMS & CONDITIONS

1. **BID SUBMITTAL FORM:** Bids must be submitted on this form only and bear the handwritten signature of an authorized representative of the firm to be considered valid. Unless otherwise stated by the City, no bidder may withdraw their bid within a period of ninety (90) days after the date set for the opening of bids.
2. **SEALED BIDS:** ALL bids must be SEALED and properly identified with the name and address of bidder; the date, time, bid number and project title on the OUTSIDE of the bid return envelope.
3. **INSURANCE:** A sheet of minimum "INSURANCE REQUIREMENTS" shall be attached to these terms and conditions when applicable. This sheet is provided for you and your insurance company.
4. Each bid must be accompanied by a bid bond issued by a surety company licensed to do business in the State of Tennessee, or by a certified or cashier's check, in an amount equal to five percent (5%) of the total bid amount. The bid bond shall be made payable to the Owner as obligee and shall be conditioned upon the bidder's acceptance of the contract, if awarded, and the furnishing of the required performance and payment bonds and insurance within the time specified in the bid documents. Failure of the successful bidder to execute the contract and provide the required bonds and insurance within the specified time will result in forfeiture of the bid security to the Owner as liquidated damages, not as penalty. Bid Bonds shall be valid for a minimum of 90 days following the bid opening.
5. Before a contract is signed by the City, the submitting entity, if selected, must provide the City Purchasing Division with a copy of its valid business license or with an affidavit explaining why it is exempt from the business licensure requirements of the city or county in which it is headquartered. If a contract is signed, the contractor's business license shall be kept current throughout the duration of the contract, and the contractor shall inform the City of changes in its business name or location.
6. Failure to examine any drawings, specifications, and instructions will be at bidder's risk. If bidder is in doubt as to the true meaning of any part of the drawings, specifications, and instructions or other documents, he should submit a written request for an interpretation to the Purchasing Department. An interpretation of the document will be made and if necessary, an addendum shall be released via the City's website at www.athenstn.gov/purchasing. The City will not be responsible for explanations or interpretations of bid documents except as issued in accordance herewith.
7. While notification is not required to submit a bid, vendors are encouraged to notify the Purchasing Agent of their intent to submit to be sure they receive any addenda which may be issued. Bids which do not acknowledge receipt of all addenda will be rejected.
8. Any alteration, erasure, additions to or omission of requested information, change of the specifications or bidding schedule, is made at the risk of the bidder and shall result in the rejection of the bid unless such changes are authorized by the specifications.

9. Bidder agrees to defend and save the City of Athens from and against all demands, claims, suits, costs, expenses, damages, and judgments based upon infringement of any patents relating to goods specified in this order or the ordinary use or operation of such goods by the City or use or operation of such goods in accordance with bidder's direction.
10. Contracts and purchases will be made or entered into with the lowest, responsible, compliant bidder meeting specifications for the particular grade or class of material, work or service desired in the best interest and advantage to the City of Athens. Responsible bidder is defined as a bidder whose reputation, past performance, and business and financial capabilities are such that he would be judged by the appropriate City authority to be capable of satisfying the City's needs for a specific contract or purchase order.
11. Bids and modifications or corrections thereof received after bid closing will not be considered. The City is not responsible for delays in delivery by mail, courier, etc.
12. Any exceptions to these terms or conditions or deviations from written specifications will be shown in writing and attached to the bid form.
13. The City shall rely on the information submitted by bidder in reaching its decision and shall have the right to demand the services as described in the bid.
14. The City reserves the right to determine the low bidder either based on the individual items or based on all items included in its Request for Bids, unless otherwise expressly provided in the Request for Bids. The City reserves the right to accept any item or group of items of any kind and to modify or cancel in whole or in part, its Request for Bids.
15. The City reserves the right to determine the low bidder by durability and maintenance cost over the life of the vehicle or equipment. This may be done by means of experience or research. Initial cost may not determine low bid.
16. Throughout these specifications the term bidder shall mean the actual bidder or any subcontractor working for the bidder to perform the scope of work while adhering to all bid requirements.
17. In case of error or discrepancy in the mathematics of the bid price, unit prices prevail.
18. Prices shall be quoted FOB Athens, TN. Delivery to City of Athens locations shall be without additional charge unless otherwise requested by the City of Athens.
19. The vendor shall comply with all applicable safety statutes and rules requiring certain protective personal apparel such as hard hats, ear plugs, eye shields, protective shoes, etc. The owner assumes no responsibility or liability for actions taken by the vendor which endanger life or property.
20. Schedule product deliveries to minimize long-term storage at Project site and to prevent overcrowding of construction spaces.
21. By submission of a signed bid, the bidder certifies total compliance with Title VI and Title VII of the Civil Rights Act of 1964, as amended and all regulations promulgated thereunder, as the City of Athens does not discriminate based on race, color, or national origin in federal or state sponsored programs, pursuant to Title VI of the Civil Rights Act of 1964 (42 USC 2000d).

22. By submission of a bid, the interested firm and each person signing on behalf of any firm certifies, and in the case of a joint award, each party thereto certifies as to its own organization, under penalty of perjury, that to the best of its knowledge and belief that each bidder is not on the list created pursuant to §12-12-106 – List of persons engaging in investment activities in Iran.
23. All contracts or purchase orders issued for this award will be governed by the laws of the State of Tennessee.
24. Bids shall be subject to the open records laws of the State of Tennessee and only information designated by TCA as exempt from public disclosure will be treated as confidential. It is the responsibility of the bidder to comply with any requirements of TCA that must be taken for information to be treated as confidential and failure to do so will result in information being subject to public disclosure.

By signing below, I hereby acknowledge that I have read, understood, and accepted the above Terms & Conditions:

BIDDER'S COMPANY NAME

COMPANY REPRESENTATIVE PRINTED NAME

SIGNATURE

TELEPHONE: _____

FAX: _____

EMAIL: _____

THIS FORM MUST BE SIGNED AND SUBMITTED WITH BID

CITY OF ATHENS STANDARD INSURANCE REQUIREMENTS

1. Statutory Worker's Compensation Insurance

a. Employer's Liability:

Bodily Injury by Accident - \$100,000 each accident

Bodily Injury by Disease - \$500,000 policy limit

Bodily Injury by Disease - \$100,000 each employee

NOTE: WC coverage may be waived if the contractor is the sole proprietor only, with no employees, and can provide the City of Athens with an APPROVED I-5 form from the Department of Labor

2. Comprehensive General Liability Insurance

a. \$1,000,000 limit of liability per occurrence for bodily injury and property damage

b. Comprehensive form covering all owned, non-owned, and hired vehicles

3. Auto Liability Insurance

a. \$1,000,000 limit of liability per occurrence for bodily injury and property damage

b. Comprehensive form covering all owned, non-owned, and hired vehicles

4. City of Athens (and any applicable Authority) should be shown as an additional insured on General Liability, Auto Liability, and Umbrella Liability policies

5. The Cancellation provision should provide 30-day notice of cancellation

6. Certificate holder should read:

City of Athens
815 N. Jackson Street
Athens, TN 37303

7. Insurance company must have an A.M. Best Rating of A-6 or higher

8. Insurance company must be licensed to do business by the Tennessee Secretary of State

9. Insurance company must be authorized to do business in Tennessee by the Tennessee Insurance Department

REVISED 03/12/25

AFFIDAVIT OF COMPLIANCE

WITH

DRUG-FREE WORKPLACE REQUIREMENTS OF TENNESSEE CODE ANNOTATED, § 50-9-113

(To be submitted with bid by vendor)

I, _____, president or other principal officer, swear or affirm that the company _____, has a drug – free workplace program that complies with Title 50, Chapter 9, Tennessee Code Annotated, in effect at the time of this bid submission at least to the extent required of governmental entities. I further swear or affirm that the company is in compliance with Tennessee Code Annotated, § 50-9-113.

“It is the policy of the City of Athens that the use of drugs/alcohol by its employees and impairment in the workplace due to drugs and/or alcohol are prohibited and will not be tolerated. Engaging in prohibited and/or illegal conduct may lead to termination of employment. Prohibited and/or illegal conduct includes but is not limited to:

1. being on duty or performing work in or on City property while under the influence of drugs and/or alcohol;
2. engaging in the manufacture, sale, distribution, use or unauthorized possession of (illegal) drugs at any time and of alcohol while on duty or while in or on City property;
3. refusing or failing a drug and/or alcohol test administered under this policy.
4. providing an adulterated, altered, or substituted specimen for testing;
5. using alcohol within four hours prior to reporting for duty on schedule or use of alcohol while on-call for duty.
6. using alcohol or drugs within eight hours following an accident (incident) if the employee's involvement has not been discounted as a contributing factor in the accident (incident) or until the employee has successfully completed drug and/or alcohol testing procedures.

This policy does not preclude the appropriate use of legally prescribed medication that does not adversely affect the mental, physical or emotional ability of the employee to safely and efficiently perform his/ her duties. It is the employee's responsibility to inform the proper supervisory personnel of his/ her use of such legally prescribed medication before the employee goes on duty or performs any work.”

I have also reviewed the above statement regarding the City of Athens Drug and Alcohol Testing Program and affirm that I have a testing program for my employees that is at least as stringent as the City's program.

(Signed): _____

Title: _____

Subscribed and sworn to before me this _____ day of _____, 20____.

NOTARY PUBLIC

My commission expires _____

No Contact/No Advocacy Affidavit

State of _____

County of _____

_____, being first duly sworn, deposes and says that:

- 1) He/She is the owner, partner, officer, representative, or agent of

_____,
the Bidder that has submitted the attached Bid.

- 2) The Bidder _____ swears or affirms that he/she will abide by the following “No Contact” and “No Advocacy” clauses:

- a) NO CONTACT POLICY: After the posting of this solicitation to the City website, any contact initiated by any bidder with any City of Athens representative concerning this bid is strictly prohibited, unless such contact is made with the Purchasing Agent or the listed Point of Contact. Any unauthorized contact may cause the disqualification of the bid from this procurement transaction.
- b) NO ADVOCATING POLICY: To ensure the integrity of the review and evaluation process, companies and/or individuals submitting bids for any part of this project, as well as those persons and/or companies representing such bidders, may not lobby or advocate to the City of Athens including, but not limited to, members of the City Council, Office of the City Manager, or any other City staff.

Any company and/or individual who does not comply with the above stated “No Contact” and “No Advocating” policies may be subject to having their bid rejected from consideration.

(Signed): _____

Title: _____

Subscribed and sworn to before me this _____ day of _____, 20____.

NOTARY PUBLIC

My commission expires _____

Non-Collusion Affidavit of Prime Bidder

State of _____

County of _____

_____, being first duly sworn, deposes and says that:

1. He/She is the _____ of _____, the firm that has submitted the attached Bid.
2. He/She is fully informed respecting the preparation and contents of the attached Bid and of all pertinent circumstances respecting such Bid.
3. Such Bid is genuine and is not a collusive or sham Bid.
4. Neither the said Bid nor any of the Bidder's officers, partners, owners, agents, representatives, employees, or parties in interest, including this affiant, has in any way colluded, conspired, connived, or agreed, directly or indirectly, with any other Bidder, firm or person to submit a collusive or sham Bid in connection with the Contract for which the attached Bid has been submitted or to refrain from bidding in connection with such Contract, or has in any manner, directly or indirectly, sought by agreement or collusion or communication or conference with any other Bidder, firm, or person to fix the price or prices in the attached Bid or of any other Bidder, firm, or person to fix any overhead, profit, or cost element of the Bid price or the Bid price of any other Bidder, or to secure through any collusion, conspiracy, connivance or unlawful agreement any advantage against the City of Athens or any person interested in the proposed Contract; and
5. The price or prices quoted in the attached Bid are fair and proper and are not tainted by any collusion, conspiracy, connivance, or unlawful agreement on the part of the Bidder or any of its agents, representatives, owners, employees, or parties in interest, including this affidavit.

(Signed): _____

Title: _____

Subscribed and sworn to before me this _____ day of _____, 20____.

NOTARY PUBLIC

My commission expires _____



STATE OF TENNESSEE

BYRD ANTI-LOBBYING AMENDMENT CERTIFICATION

Contractors who apply or bid for an award of \$100,000 or more shall file the required certification. Each tier certifies to the tier above that it will not and has not used Federal appropriated funds to pay any person or organization for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, officer or employee of Congress, or an employee of a Member of Congress in connection with obtaining any Federal contract, grant, or any other award covered by 31 U.S.C. § 1352.

Each tier shall also disclose any lobbying with non-Federal funds that takes place in connection with obtaining any Federal award. Such disclosures are forwarded from tier to tier up to the recipient who in turn will forward the certification(s) to the awarding agency.

APPENDIX A, 44 C.F.R. PART 18 – CERTIFICATION REGARDING LOBBYING – REQUIRED FOR CONTRACTS OVER \$100,000 *Certification for Contracts, Grants, Loans, and Cooperative Agreements*

The undersigned certifies, to the best of his or her knowledge and belief, that:

- ☐ No Federal appropriated funds have been paid or will be paid, by or on behalf of the undersigned, to any person for influencing or attempting to influence an officer or employee of an agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of any Federal contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any Federal contract, grant, loan, or cooperative agreement.
- ☐ If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with this Federal contract, grant, loan, or cooperative agreement, the undersigned shall complete and submit Standard Form-LLL, "Disclosure Form to Report Lobbying," in accordance with its instructions.
- ☐ The undersigned shall require that the language of this certification be included in the award documents for all subawards at all tiers (including subcontracts, subgrants, and contracts under grants, loans, and cooperative agreements) and that all subrecipients shall certify and disclose accordingly.

This certification is a material representation of fact upon which reliance was placed when this transaction was made or entered into. Submission of this certification is a prerequisite for making or entering into this transaction imposed by section 1352, title 31, U.S. Code. Any person who fails to file the required certification shall be subject to a civil penalty of not less than \$10,000 and not more than \$100,000 for each such failure.

The Contractor certifies or affirms the truthfulness and accuracy of each statement of its certification and disclosure, if any. In addition, the Contractor understands and agrees that the provisions of 31 U.S.C. Chap. 38, Administrative Remedies for False Claims and Statements, apply to this certification and disclosure, if any.

Signature of Authorized Representative	Date
Printed Name and Title	Phone Number / Email Address



STATE OF TENNESSEE
CERTIFICATION REGARDING DEBARMENT, SUSPENSION
AND OTHER RESPONSIBILITY MATTERS

The prospective participant certifies to the best of its knowledge and belief that it and its principals:

- ☐ Are not presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from covered transactions by any Federal department or agency;
- ☐ Have not within a three-year period preceding this proposal been convicted of or had a civil judgement rendered against them for commission of fraud or a criminal offense in connection with obtaining, attempting to obtain, or performing a public (Federal, State, or local) transaction or contract under a public transaction; violation of Federal or State antitrust statutes or commission of embezzlement, theft, forgery, bribery, falsification or destruction of records, making false statements, or receiving stolen property;
- ☐ Are not presently indicted for or otherwise criminally or civilly charged by a government entity (Federal, State, or local) with commission of any of the offenses enumerated in paragraph (b) of this certification; and
- ☐ Have not within a three-year period preceding this application/proposal had one or more public transactions (Federal, State, or local) terminated for cause or default.

I understand that a false statement on this certification may be grounds for rejection of this proposal or termination of the award. In addition, under 18 USC Sec. 1001, a false statement may result in a fine of up to \$10,000 or imprisonment for up to 5 years, or both.

Signature of Authorized Representative	Date
Printed Name	Phone Number / Email Address

☐ I am unable to certify to the above statements. Explanation is attached.



STATE OF TENNESSEE
IRAN DIVESTMENT ACT CERTIFICATION

SUBJECT CONTRACT NUMBER(S):	
CONTRACTOR LEGAL ENTITY NAME:	
EDISON SUPPLIER IDENTIFICATION NUMBER:	

The Iran Divestment Act, Tenn. Code Ann. § 12-12-101 et. seq. requires a person that attempts to contract with the state, including a contract renewal or assumption, to certify at the time the bid is submitted or the contract is entered into, renewed, or assigned, that the person or the assignee is not identified on a list created pursuant to § 12-12-106.

Currently, the list is available online at the following website: <https://www.tn.gov/generalservices/procurement/central-procurement-office--cpo-/library-/public-information-library.html>

The Contractor, identified above, certifies by signature below that it is not included on the list of persons created pursuant to Tenn. Code Ann. § 12-12-106 of the Iran Divestment Act.

CONTRACTOR SIGNATURE

NOTICE: This certification MUST be signed by an individual with legal capacity to contractually bind the Contractor.

PRINTED NAME AND TITLE OF SIGNATORY

DATE

AFFIDAVIT OF COMPLIANCE

WITH

CERTIFICATION THAT COMPANY NOT ENGAGED IN

BOYCOTT OF ISRAEL

TENNESSEE CODE ANNOTATED, § 12-4-119

(To be submitted with bid by construction contractor)

I, _____, president or other principal
officer of _____, swear or affirm that

NAME OF COMPANY

the company has non-boycott of Israel program that complies with Title 12, Chapter 4, Tennessee Code Annotated, in effect at the time of this bid submission at least to the extent required of governmental entities. I further swear or affirm that the company is in compliance with Tennessee Code Annotated, § 12-4-119.

President

Or

Principal Officer

For: _____
Name of Company

STATE OF TENNESSEE)
COUNTY OF _____)

Subscribed and sworn before me by _____,

President or principal officer of _____,

On this _____ day of _____, 20____.

Notary Public

My Commission expires: _____



STATE OF TENNESSEE
CERTIFICATION OF BIDDER REGARDING
USE OF WOMEN/MINORITY SUBCONTRACTORS
****Construction Projects Only****

This certification is required for the contractor to demonstrate that when subcontractors are to be used on this project, an attempt will be made to utilize women/minority owned firms.

Documentation must be on file to show who has been contacted.

- ☐ I certify that every attempt was made to utilize female/minority contractors on this project.
- ☐ I am unable to certify to the above statements. Explanation is attached.

Signature of Authorized Representative	Date
Printed Name	Phone Number
Email Address	Address

PROJECT MANUAL

VARIOUS STORMWATER IMPROVEMENTS CONSTRUCTION

PROJECT SITES:

MAYFIELD REGIONAL DETENTION

REGIONAL PARK DREDGING AND STABILIZATION

COOK DRIVE POND IMPROVEMENTS

ATHENS, TENNESSEE



AUGUST 2025



ARCHITECTS / ENGINEERS

222 SECOND AVENUE SOUTH, SUITE 1400

NASHVILLE, TENNESSEE 37201-2308

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**MAYFIELD REGIONAL DETENTION
REGIONAL PARK DREDGING AND STABILIZATION
COOK DRIVE POND IMPROVEMENTS
ATHENS, TENNESSEE
Gresham Smith Project No.: 46762.02**

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**MAYFIELD REGIONAL DETENTION
REGIONAL PARK DREDGING AND STABILIZATION
COOK DRIVE POND IMPROVEMENTS
ATHENS, TENNESSEE
Gresham Smith Project No.: 46762.02**

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END OF SECTION 00 0110

**MAYFIELD REGIONAL DETENTION
REGIONAL PARK DREDGING AND STABILIZATION
COOK DRIVE POND IMPROVEMENTS
ATHENS, TENNESSEE
Gresham Smith Project No.: 46762.02**

**SECTION 00 0107
SEALS PAGE**

DESIGN PROFESSIONALS OF RECORD

1.1 ENGINEER:

- A. Rebekah Higgins
 - 1. No. 126280
 - 2. Responsible for Regional Park Dredging and Stabilization Design Plan Set and Cook Drive Pond Improvements Design Plan Set. Responsible for Divisions 01-49 Sections where applicable to the Regional Park Dredging and Stabilization Design Plan Set and Cook Drive Pond Improvements Design Plan Set.
- B. Levi Sciara
 - 1. No. 120791
 - 2. Responsible for Mayfield Regional Detention Design Plan Set. Responsible for Divisions 01-49 Sections where applicable to the Mayfield Regional Detention Plan Set.

**MAYFIELD REGIONAL DETENTION
REGIONAL PARK DREDGING AND STABILIZATION
COOK DRIVE POND IMPROVEMENTS
ATHENS, TENNESSEE
Gresham Smith Project No.: 46762.02**

**SECTION 00 4100
BID FORM**

TO: Athens City Hall
815 North Jackson Street
Athens, TN 37303

1. Pursuant to and in compliance with the Advertisement for Bid and the Bidding Documents relating to construction of:
Mayfield Regional Detention
Regional Park Dredging and Stabilization
Cook Drive Pond Improvements
Including Addenda _____

The undersigned, having become thoroughly familiar with the terms and conditions of the Bidding Documents and with local conditions affecting the performance and costs of the Work at the place where the Work is to be completed, and having fully inspected the site in all particulars, hereby proposes and agrees to fully perform the Work within the time stated and in strict accordance with the Bidding Documents, including furnishing any and all labor and materials, and to do all of the work required to construct and complete said Work in accordance with the Bidding Documents, for the following unit prices:

Site A - Mayfield Regional Detention					
Item No.	Item Description	Units	Qty	Cost	
				Unit Price	Total Price
1	Mobilization	LS	1		
2	Traffic Control	LS	1		
3	Erosion Control	LS	1		
4	Earthwork	LS	1		
5	Geotechnical Investigation	LS	1		
6	Landscaping	LS	1		
7	8" Sanitary Sewer Pipe	LF	131		
8	Manhole	EA	1		
9	RCP Pipe Culvert, 36"	LF	34		
10	Concrete Headwall, 36"	EA	2		

**MAYFIELD REGIONAL DETENTION
REGIONAL PARK DREDGING AND STABILIZATION
COOK DRIVE POND IMPROVEMENTS
ATHENS, TENNESSEE
Gresham Smith Project No.: 46762.02**

11	Seeding	AC	3.3		
12	Vegetated Gabions	CY	330		
13	Compacted Backfill	CY	500		
14	Geotextile Fabric	SY	600		
15	Rip Rap	CY	1,800		
16	Permeable Pavers	SF	13,200		
17	Ribbon Curb	LF	2,900		
18	Aggregate Base Course	CY	400		
18	ADA Tiles	SF	26		
19	Concrete Sidewalk	SF	93		
20	Permatrack Overlook	LS	1		
				Subtotal:	

Site B - Regional Park Dredging and Stabilization					
Item No.	Item Description	Units	Qty	Cost	
				Unit Price	Total Price
1	Mobilization	LS	1		
2	Traffic Control	LS	1		
3	Erosion Control	LS	1		
4	Earthwork	LS	1		
5	Mechanical Dredging	CY	4,000		
6	Filter Bag*	EA	20		
7	Seeding	AC	1.8		
8	Sod	SY	2,000		
9	Vegetated Gabions	CY	440		

**MAYFIELD REGIONAL DETENTION
REGIONAL PARK DREDGING AND STABILIZATION
COOK DRIVE POND IMPROVEMENTS
ATHENS, TENNESSEE
Gresham Smith Project No.: 46762.02**

10	Compacted Backfill	CY	650		
11	Geotextile Fabric	SY	800		
				Subtotal:	

*Multiple dewatering device options are acceptable. Bid should reflect the contractor's anticipated device and associated cost.

Site C - Cook Drive Pond Improvements					
Item No.	Item Description	Units	Qty	Cost	
				Unit Price	Total Price
1	Mobilization	LS	1		
2	Traffic Control	LS	1		
3	Erosion Control	LS	1		
4	Earthwork	LS	1		
5	Outlet Structure	EA	1		
6	First Flush Trash Rack	EA	1		
7	Concrete	CY	1		
8	Storm Pipe Removal	FT	10		
9	Seeding	AC	0.6		
				Subtotal:	

TOTAL BASE BID (Site A + B + C):

_____ Dollars
(Words)

and _____ Cents, (\$ _____)
(Words) (Numerals)

**MAYFIELD REGIONAL DETENTION
REGIONAL PARK DREDGING AND STABILIZATION
COOK DRIVE POND IMPROVEMENTS
ATHENS, TENNESSEE
Gresham Smith Project No.: 46762.02**

2. Lowest responsive bidder determination will be based on the Total Base Bid (Parts A+B+C).
3. Bids shall include all taxes and fees, including sales tax (where required).
4. I understand that the Owner reserves the right to reject this Bid, but that this Bid shall remain open and not be withdrawn for a period of 60 days from the date prescribed for its receiving.
5. The Bidder, if awarded a contract, hereby agrees to commence work under the Contract on or before a date to be specified in the Notice to Proceed from the Owner and fully complete the project within the time specified in Division 00 Document "Information for Bidders". Bidder also accepts the provisions for liquidated damages in the event of failure to complete the Project on time.
6. If written notice of acceptance of bid is mailed or delivered to the undersigned within 30 days after the Bid date, or at any other time thereafter before it is withdrawn, the undersigned shall execute and deliver the Contract Documents to the Owner in accordance with this Bid as accepted. The undersigned will also furnish and deliver to the Owner the Performance Bond, Labor and Material Payment Bond, and proof of insurance coverage, all within 15 days after delivery or after the notice of award is deposited in the mail.
7. Bid amounts are to be written in both words and numerals. In case of discrepancy, the amount written in words will govern.
8. Notice of award, or request for additional information, may be addressed to the undersigned at the address set forth below.
9. Bidder declares that he understands any unit quantities shown on the Bid Form are approximate only and are subject to increase or decrease. Bidder agrees that should the quantities of any such items be decreased, no claim will be made for anticipated profits nor will the Owner honor such claims.

**MAYFIELD REGIONAL DETENTION
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COOK DRIVE POND IMPROVEMENTS
ATHENS, TENNESSEE
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10. The names of all persons interested in the foregoing Bid as principals are:

(IMPORTANT NOTICE: If Bidder or other interested person is a corporation, give legal name of corporation, state where incorporated, and names of president and secretary; if a partnership, give name of firm and names of all individual co-partners composing the firm; if Bidder or other interested person is an individual, give first and last names in full)

licensed in accordance with an act for the registration of contractors, and with license number _____ in the State of _____.

SIGN HERE:

Signature of Bidder

NOTE: If Bidder is a corporation, set forth the legal name of the corporation together with the signature of the officer or officers authorized to sign contracts on behalf of the corporation. If bidder is a partnership, set forth the name of the firm together with the signature of the partner or partners authorized to sign contracts on behalf of the partnership.

Business Address:

Telephone Number:

Date of Proposal:

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END OF SECTION 00 4100

**MAYFIELD REGIONAL DETENTION
REGIONAL PARK DREDGING AND STABILIZATION
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ATHENS, TENNESSEE
Gresham Smith Project No.: 46762.02**

**SECTION 00 4300
BID BOND**

The Bid Bond, EJCDC Document C-430, 2007 edition, forms a part of the Construction Documents and is attached.

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END OF SECTION 00 4300

BID BOND

Any singular reference to Bidder, Surety, Owner or other party shall be considered plural where applicable.

BIDDER (*Name and Address*):

SURETY (*Name and Address of Principal Place of Business*):

OWNER (*Name and Address*):

BID

Bid Due Date:

Description (*Project Name and Include Location*):

BOND

Bond Number:

Date (*Not earlier than Bid due date*):

Penal sum _____ \$ _____
(Words) (Figures)

Surety and Bidder, intending to be legally bound hereby, subject to the terms set forth below, do each cause this Bid Bond to be duly executed by an authorized officer, agent, or representative.

BIDDER

SURETY

Bidder's Name and Corporate Seal (Seal)

Surety's Name and Corporate Seal (Seal)

By: _____
Signature

By: _____
Signature (Attach Power of Attorney)

Print Name

Print Name

Title

Title

Attest: _____
Signature

Attest: _____
Signature

Title

Title

Note: Above addresses are to be used for giving any required notice. Provide execution by any additional parties, such as joint venturers, if necessary.

1. Bidder and Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors, and assigns to pay to Owner upon default of Bidder the penal sum set forth on the face of this Bond. Payment of the penal sum is the extent of Bidder's and Surety's liability. Recovery of such penal sum under the terms of this Bond shall be Owner's sole and exclusive remedy upon default of Bidder.
2. Default of Bidder shall occur upon the failure of Bidder to deliver within the time required by the Bidding Documents (or any extension thereof agreed to in writing by Owner) the executed Agreement required by the Bidding Documents and any performance and payment bonds required by the Bidding Documents.
3. This obligation shall be null and void if:
 - 3.1 Owner accepts Bidder's Bid and Bidder delivers within the time required by the Bidding Documents (or any extension thereof agreed to in writing by Owner) the executed Agreement required by the Bidding Documents and any performance and payment bonds required by the Bidding Documents, or
 - 3.2 All Bids are rejected by Owner, or
 - 3.3 Owner fails to issue a Notice of Award to Bidder within the time specified in the Bidding Documents (or any extension thereof agreed to in writing by Bidder and, if applicable, consented to by Surety when required by Paragraph 5 hereof).
4. Payment under this Bond will be due and payable upon default of Bidder and within 30 calendar days after receipt by Bidder and Surety of written notice of default from Owner, which notice will be given with reasonable promptness, identifying this Bond and the Project and including a statement of the amount due.
5. Surety waives notice of any and all defenses based on or arising out of any time extension to issue Notice of Award agreed to in writing by Owner and Bidder, provided that the total time for issuing Notice of Award including extensions shall not in the aggregate exceed 120 days from Bid due date without Surety's written consent.
6. No suit or action shall be commenced under this Bond prior to 30 calendar days after the notice of default required in Paragraph 4 above is received by Bidder and Surety and in no case later than one year after Bid due date.
7. Any suit or action under this Bond shall be commenced only in a court of competent jurisdiction located in the state in which the Project is located.
8. Notices required hereunder shall be in writing and sent to Bidder and Surety at their respective addresses shown on the face of this Bond. Such notices may be sent by personal delivery, commercial courier, or by United States Registered or Certified Mail, return receipt requested, postage pre-paid, and shall be deemed to be effective upon receipt by the party concerned.
9. Surety shall cause to be attached to this Bond a current and effective Power of Attorney evidencing the authority of the officer, agent, or representative who executed this Bond on behalf of Surety to execute, seal, and deliver such Bond and bind the Surety thereby.
10. This Bond is intended to conform to all applicable statutory requirements. Any applicable requirement of any applicable statute that has been omitted from this Bond shall be deemed to be included herein as if set forth at length. If any provision of this Bond conflicts with any applicable statute, then the provision of said statute shall govern and the remainder of this Bond that is not in conflict therewith shall continue in full force and effect.
11. The term "Bid" as used herein includes a Bid, offer, or proposal as applicable.

**MAYFIELD REGIONAL DETENTION
REGIONAL PARK DREDGING AND STABILIZATION
COOK DRIVE POND IMPROVEMENTS
ATHENS, TENNESSEE
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**SECTION 00 4513
STATEMENT OF EXPERIENCE OF BIDDER**

The Bidder shall list, at a minimum, three projects with references that are comparable in scope and size to the projects being bid on.

	PROJECT AND LOCATION	REFERENCE
(1)		
(2)		
(3)		
(4)		
(5)		
(6)		
(7)		
(8)		
DATED:		
		BIDDER
		BY:

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END OF SECTION 00 4513

MAYFIELD REGIONAL DETENTION
REGIONAL PARK DREDGING AND STABILIZATION
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SECTION 00 4537
DRUG-FREE WORKPLACE AFFIDAVIT OF PRIME BIDDER

STATE OF _____
COUNTY OF _____

NOW COMES AFFIANT, WHO BEING DULY SWORN, DEPOSES AND SAYS:

HE/SHE IS THE PRINCIPAL OFFICER FOR _____;

THAT THE BIDDING ENTITY HAS SUBMITTED A BID TO FOR THE CONSTRUCTION OF MAYFIELD REGIONAL DETENTION, REGIONAL PARK DREDGING AND STABILIZATION, AND COOK DRIVE POND IMPROVEMENTS.

THAT THE BIDDING ENTITY EMPLOYS NO LESS THAN FIVE (5) EMPLOYEES;

THAT AFFIANT CERTIFIES THAT THE BIDDING ENTITY HAS IN EFFECT, AT THE TIME OF SUBMISSION OF ITS BID TO PERFORM THE CONSTRUCTION REFERRED TO ABOVE, A DRUG-FREE WORKPLACE PROGRAM THAT COMPLIES WITH ☐ 50-9-113, TENNESSEE CODE ANNOTATED.

THAT THIS AFFIDAVIT IS MADE ON PERSONAL KNOWLEDGE.

FURTHER AFFIANT SAITH NOT.

AFFIANT

SUBSCRIBED AND SWORN BEFORE ME THIS _____ DAY OF _____, 20____.

NOTARY PUBLIC

MY COMMISSION EXPIRES: _____

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END OF SECTION 00 4537

MAYFIELD REGIONAL DETENTION
REGIONAL PARK DREDGING AND STABILIZATION
COOK DRIVE POND IMPROVEMENTS
ATHENS, TENNESSEE
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SECTION 00 4538
STATEMENT OF COMPLIANCE CERTIFICATE – ILLEGAL IMMIGRANTS

EACH CONTRACTOR BIDDING SHALL FILL IN AND SIGN THE FOLLOWING

THIS IS TO CERTIFY THAT _____ HAVE FULLY
COMPLIED WITH ALL THE REQUIREMENTS OF CHAPTER NO. 878 (HOUSE BILL NO. 111 AND SENATE BILL
NO. 411) WHICH SERVES TO AMEND TENNESSEE CODE ANNOTATED TITLE 12, CHAPTER 4, PART I.

ALL BIDDERS FOR CONSTRUCTION SERVICES ON THIS PROJECT SHALL BE REQUIRED TO SUBMIT AN
AFFIDAVIT (BY EXECUTING THIS COMPLIANCE DOCUMENT) AS PART OF THEIR BID, WHICH ATTESTS
THAT SUCH BIDDER SHALL COMPLY WITH REQUIREMENTS OF CHAPTER NO. 878.

SIGNED:

STATE OF

COUNTY OF

PERSONALLY APPEARED BEFORE ME, _____ THE UNDERSIGNED
NOTARY PUBLIC, _____, THE WITHIN NAMED BARGAINOR, WITH WHOM I
AM PERSONALLY ACQUAINTED, AND KNOWN TO ME TO BE THE PRESIDENT / OWNER / PARTNER (AS
APPLICABLE) OF THE _____, CORPORATION, PARTNERSHIP, SOLE
PROPRIETORSHIP (AS APPLICABLE) AND ACKNOWLEDGED TO ME THAT HE EXECUTED THE FOREGOING
DOCUMENT FOR THE PURPOSES RECITED THEREIN.

WITNESS MY HAND, AT OFFICE, THIS _____ DAY OF _____, 20____.

NOTARY PUBLIC

MY COMMISSION EXPIRES _____

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GRESHAM SMITH*

END OF SECTION 00 4538

MAYFIELD REGIONAL DETENTION
REGIONAL PARK DREDGING AND STABILIZATION
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SECTION 00 4553
CONSTRUCTION ACTIVITY - STORM WATER DISCHARGES - NOTICE OF INTENT (ATTACHMENT)

THE STATE OF TENNESSEE DEPARTMENT OF ENVIRONMENT AND CONSERVATION, DIVISION OF WATER POLLUTION CONTROL, REQUIRES THE FOLLOWING DOCUMENTATION – FORM CN-0940 ATTACHED.

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END OF SECTION 00 4553



**TENNESSEE DEPARTMENT OF ENVIRONMENT AND CONSERVATION
DIVISION OF WATER RESOURCES**

Davy Crockett Tower, 500 James Robertson Parkway 9th Floor Nashville, TN 37243
Toll Free Number: 1-888-891-8332 (TDEC)

**NOTICE OF INTENT (NOI) FOR GENERAL NPDES PERMIT FOR
STORMWATER DISCHARGES FROM CONSTRUCTION ACTIVITIES (TNR100000)**

Site or Project Name:		NPDES Tracking Number: TNR	
Street Address including city or zip code or Location:		Construction Start Date:	
		Estimated End Date:	
Site Description:		Latitude (dd.dddd):	
		Longitude (-dd.dddd):	
County(ies):	MS4 Jurisdiction (if applicable):	Acres Disturbed:	
		Total Acres:	
Are there any streams ☐ and/or wetlands ☐ on or adjacent to the construction site? If wetlands are located on-site and may be impacted, attach wetlands delineation report. If an Aquatic Resource Alteration Permit has been obtained for this site, what is the permit number? ARAP Number:			
Receiving waters:			
Include the SWPPP with the NOI ☐ SWPPP Included		Include a site location map ☐ Map Included	

Name of Site Owner or Developer (Site-Wide Permittee): (correct legal name of person, company, or entity that has operational or design control over construction plans and specifications)			
For corporate entities only, provide the Tennessee Secretary of State (SOS) Control Number:			
Site Owner or Developer Contact Name: (individual responsible for site)		Title or Position: (the party who signs the certification below):	
Mailing Address:	City:	State:	Zip:
Phone:	E-mail:		

Optional Contact Name:	Title or Position:		
Mailing Address:	City:	State:	Zip:
Phone:	E-mail:		

Owner or Developer Certification: (must be signed by president, vice-president or equivalent, or ranking elected official) (Primary Permittee)

I certify under penalty of law that this document and all attachments were prepared by me, or under my direction or supervision. The submitted information is to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment. As specified in Tennessee Code Annotated Section 39-16-702(a)(4), this declaration is made under penalty of perjury.

Owner or Developer Name: (print or type):

Signature:

Date:

Contractor(s) Certification: (must be signed by president, vice-president or equivalent, or ranking elected official) (Secondary Permittee)

I certify under penalty of law that I have reviewed this document, any attachments, and the SWPPP referenced above. Based on my inquiry of the construction site owner/developer identified above and/or my inquiry of the person directly responsible for assembling this NOI and SWPPP, I believe the information submitted is accurate. I am aware that this NOI, if approved, makes the above-described construction activity subject to NPDES permit number TNR100000, and that certain of my activities on-site are thereby regulated. I am aware that there are significant penalties, including the possibility of fine and imprisonment for knowing violations, and for failure to comply with these permit requirements. As specified in Tennessee Code Annotated Section 39-16-702(a)(4), this declaration is made under penalty of perjury.

Primary contractor name, address, and SOS control number (if applicable): (print or type)

Signature:

Date:

Primary contractor name, address, and SOS control number (if applicable): (print or type)

Signature:

Date:

Primary contractor name, address, and SOS control number (if applicable): (print or type)

Signature:

Date:

NOTICE OF INTENT (NOI) FOR GENERAL NPDES PERMIT FOR STORMWATER DISCHARGES FROM CONSTRUCTION ACTIVITIES (TNR100000)

Purpose of this form - A completed notice of intent (NOI) must be submitted to obtain coverage under the Tennessee General NPDES Permit for Discharges of Stormwater Associated with Construction Activity (permit). **Requesting coverage under this permit means that an applicant has obtained and examined a copy of this permit, and thereby acknowledges applicant's claim of ability to be in compliance with permit terms and conditions.** This permit is required for stormwater discharge(s) from construction activities including clearing, grading, filling, and excavating (including borrow pits) of one or more acres of land. This form should be submitted at least 30 days prior to the commencement of land disturbing activities, or no later than 48 hours prior to when a new operator assumes operational control over site specifications or commences work at the site.

The appropriate permit application fee must accompany the NOI and is based on total acreage to be disturbed by an entire project, including any associated construction support activities (e.g., equipment staging yards, material storage areas, excavated material disposal areas, borrow or waste sites):

(i) Projects equal to or greater than 150 acres	\$10,000
(ii) Projects equal to or greater than 50 acres and less than 150 acres	\$6,000
(iii) Projects equal to or greater than 20 acres and less than 50 acres	\$3,000
(iv) Projects equal to or greater than 5 acres and less than 20 acres	\$1,000
(v) Projects equal to or greater than 1 acre and less than 5 acres	\$250
(vi) Projects seeking subsequent coverage under an actively covered larger common plan of development or sale	\$100

There is no fee for sites less than 1 acre. A separate annual maintenance fee is also required for construction activities that exceed 1 year under general permit coverage. Tennessee Rules, Chapter 0400-40-11-.02(b)(12)).

Who must submit the NOI form? Per Section 2 of the permit, all site operators must submit an NOI form. "Operator" for the purpose of this permit and in the context of stormwater associated with construction activity means any person associated with a construction project who meets either or both of the following two criteria: (1) The person has operational or design control over construction plans and specifications, including the ability to make modifications to those plans and specifications. This person is typically the owner or developer of the project or a portion of the project (e.g. subsequent builder), or the person that is the current landowner of the construction site. This person is considered the primary permittee; or (2) The person has day-to-day operational control of those activities at a project which are necessary to ensure compliance with a SWPPP for the site or other permit conditions. This person is typically a contractor or a commercial builder who is hired by the primary permittee and is considered a secondary permittee.

Owners, developers, and all contractors that meet the definition of the operator in subsection 2.2 of the permit shall apply for permit coverage on the same NOI, insofar as possible. After permit coverage has been granted to the primary permittee, any separate or subsequent NOI submittals must include the site's previously assigned permit tracking number and the project name. The site-wide site-specific SWPPP shall be prepared in accordance with the requirements of part 5 of the permit and must be submitted with the NOI unless the NOI being submitted is to only add a contractor (secondary permittee) to an existing coverage. Artificial entities (e.g., corporations or partnerships excluding entities not required to register) must submit the TN Secretary of State, Division of Business Services, control number. The Division reserves the right to deny coverage to artificial entities that are not properly registered and in good standing with the TN Secretary of State.

Notice of Coverage - The division will review the NOI for completeness and accuracy and prepare a notice of coverage (NOC). Stormwater discharge from the construction site is authorized as of the effective date of the NOC.

Complete the form - Type or print clearly, using ink and not markers or pencil. Answer each item or enter "NA," for not applicable, if a particular item does not fit the circumstances or characteristics of your construction site or activity. If you need additional space, attach a separate piece of paper to the NOI form. **The NOI will be considered incomplete without a permit fee, a map, and the SWPPP.**

Describe and locate the project - Use the legal or official name of the construction site. If a construction site lacks street name or route number, give the most accurate geographic information available to describe the location (reference to adjacent highways, roads, and structures, e.g., intersection of state highways 70 and 100). Latitude and longitude (expressed in decimal degrees) of the center of the site can be located on USGS quadrangle maps. The maps can be obtained at the USGS World Wide Web site: <http://www.usgs.gov/>; latitude and longitude information can be found at numerous other web sites. Attach a copy of a portion of a 7.5-minute topographic map, a city map, or a county map showing location of site, with boundaries at least one mile outside the site boundaries. Provide estimated starting date of clearing activities and completion date of the project, and an estimate of the number of acres of the site on which soil will be disturbed, including borrow areas, fill areas, stockpiles and the total acres. For linear projects, give location at each end of the construction area.

Give name of the receiving waters - Trace the route of stormwater runoff from the construction site and determine the name of the river(s), stream(s), creek(s), wetland(s), lake(s) or any other water course(s) into which the stormwater runoff drains. Note that the receiving water course may or may not be located on the construction site. If the first water body receiving construction site runoff is unnamed ("unnamed tributary"), determine the name of the water body that the unnamed tributary enters.

An ARAP may be required - If your work will disturb or cause alterations of a stream or wetland, you must obtain an appropriate Aquatic Resource Alteration Permit (ARAP). If you have a question about the ARAP program, contact your local Environmental Field Office (EFO).

Submitting the form and obtaining more information - Note that this form must be signed by the company President, Vice-President, or a ranking elected official in the case of a municipality, for details see subpart 2.5. For more information, contact your local EFO at the toll-free number 1-888-891-8332 (TDEC). Submit the completed NOI form (keep a copy for your records) to the appropriate EFO for the county(ies) where the construction activity is located, addressed to **Attention: Stormwater NOI Processing** or use MyTDEC Forms for electronic submittal.

EFO	Street Address	Zip Code	EFO	Street Address	Zip Code
Memphis	8383 Wolf Lake Drive, Bartlett	38133-4119	Cookeville	1221 South Willow Ave.	38506
Jackson	1625 Hollywood Drive	38305-4316	Chattanooga	1301 Riverfront Parkway, Suite 206	37402-2013
Nashville	711 R S Gass Boulevard	37243	Knoxville	3711 Middlebrook Pike	37921
Columbia	1421 Hampshire Pike	38401	Johnson City	2305 Silverdale Road	37601

**MAYFIELD REGIONAL DETENTION
REGIONAL PARK DREDGING AND STABILIZATION
COOK DRIVE POND IMPROVEMENTS
ATHENS, TENNESSEE
Gresham Smith Project No.: 46762.02**

**SECTION 00 5210
CONTRACT AGREEMENT FORM**

THE "SUGGESTED FORM OF AGREEMENT BETWEEN OWNER AND CONTRACTOR FOR CONSTRUCTION CONTRACT (STIPULATED PRICE), FUNDING AGENCY EDITION," EJCDC C-520 (2007 EDITION) FORMS A PART OF THE CONSTRUCTION DOCUMENTS.

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END OF SECTION 00 5210

**SUGGESTED FORM OF AGREEMENT
BETWEEN OWNER AND CONTRACTOR
FOR CONSTRUCTION CONTRACT (STIPULATED PRICE)**

THIS AGREEMENT is by and between _____ City of Athens _____ (“Owner”) and
_____. (“Contractor”).

Owner and Contractor hereby agree as follows:

ARTICLE 1 – WORK

- 1.01 Contractor shall complete all Work as specified or indicated in the Contract Documents. The Work is generally described as follows:

Various Stormwater Improvements

Refer to Specifications, Bid Form, and Drawings for details

ARTICLE 2 – THE PROJECT

- 2.01 The Project for which the Work under the Contract Documents may be the whole or only a part is generally described as follows:

Various Stormwater Improvements

ARTICLE 3 – ENGINEER

- 3.01 The Project has been designed by Gresham Smith, 222 Second Avenue South, Suite 1400, Nashville, Tennessee 37201-2308 (Engineer), which is to act as Owner’s representative, assume all duties and responsibilities, and have the rights and authority assigned to Engineer in the Contract Documents in connection with the completion of the Work in accordance with the Contract Documents.

ARTICLE 4 – CONTRACT TIMES

4.01 *Time of the Essence*

- A. All time limits for Milestones, if any, Substantial Completion, and completion and readiness for final payment as stated in the Contract Documents are of the essence of the Contract.

4.02 *Days to Achieve Substantial Completion and Final Payment*

- A. The Work will be substantially completed within 240 calendar days after the date when the Contract Times commence to run as provided in Paragraph 2.03 of the General Conditions, and completed and ready for final payment in accordance with Paragraph 14.07 of the General Conditions within 303 consecutive calendar days after the date when the Contract Times commence to run.

4.03 *Liquidated Damages*

- A. Contractor and Owner recognize that time is of the essence as stated in Paragraph 4.01 above and that Owner will suffer financial loss if the Work is not completed within the times specified in Paragraph 4.02 above, plus any extensions thereof allowed in accordance with Article 12 of the General Conditions. The parties also recognize the delays, expense, and difficulties involved in proving in a legal or arbitration preceding the actual loss suffered by Owner if the Work is not completed on time. Accordingly, instead of requiring any such proof, Owner and Contractor agree that as liquidated damages for delay (but not as a penalty), Contractor shall pay Owner \$5,000.00 for each day that expires after the time specified in Paragraph 4.02 above for Substantial Completion until the Work is substantially complete. After Substantial Completion, if Contractor shall neglect, refuse, or fail to complete the remaining Work within the Contract Time or any proper extension thereof granted by Owner, Contractor shall pay Owner \$5,000.00 for each day that expires after the time specified in Paragraph 4.02 above for completion and readiness for final payment until the Work is completed and ready for final payment.

ARTICLE 5 – CONTRACT PRICE

- 5.01 Owner shall pay Contractor for completion of the Work in accordance with the Contract Documents an amount in current funds equal to the sum of the amount stated in Contractor's Bid, attached hereto as an exhibit.
- 5.02 Owner shall deduct "Engineering Expense Adjustment Items" at the rates listed on the Bid Form as required to compensate the Engineer for additional Construction Administration Services required due to Contractor's field omissions or administrative errors.
- 5.03 Owner shall deduct "Resident Project Representative Expense Adjustment Items" at the rates listed on the Bid Form as required to compensate the Engineer for additional Construction Administration Services required due to Contractor's request for extended working hours.

ARTICLE 6 – PAYMENT PROCEDURES

6.01 *Submittal and Processing of Payments*

- A. Contractor shall submit Applications for Payment in accordance with Article 14 of the General Conditions. Applications for Payment will be processed by Engineer as provided in the General Conditions.

6.02 *Progress Payments; Retainage*

- A. Owner shall make progress payments on account of the Contract Price on the basis of Contractor's Applications for Payment on or about a date established at the Pre-Construction Conference for each month during performance of the Work as provided in Paragraph 6.02.A.1 below. All such payments will be measured by the schedule of values established as provided in Paragraph 2.07.A of the General Conditions (and in the case of Unit Price Work based on the number of units completed) or, in the event there is no schedule of values, as provided in the General Requirements.

1. Prior to Substantial Completion, progress payments will be made in an amount equal to the percentage indicated below but, in each case, less the aggregate of payments previously made and less such amounts as Engineer may determine or Owner may withhold, including but not limited to liquidated damages, in accordance with Paragraph 14.02 of the General Conditions.
 - a. 95 percent of Work completed (with the balance being retainage); and
 - b. 95 percent of cost of materials and equipment not incorporated in the Work (with the balance being retainage).
- B. Upon Substantial Completion, Owner shall pay an amount sufficient to increase total payments to Contractor to 95 percent of the Work completed, less such amounts as Engineer shall determine in accordance with Paragraph 14.02.B.5 of the General Conditions and less 100 percent of Engineer's estimate of the value of Work to be completed or corrected as shown on the tentative list of items to be completed or corrected attached to the certificate of Substantial Completion.

6.03 *Final Payment*

- A. Upon final completion and acceptance of the Work in accordance with Paragraph 14.07 of the General Conditions, Owner shall pay the remainder of the Contract Price as recommended by Engineer as provided in said Paragraph 14.07.

ARTICLE 7 – INTEREST

- 7.01 All moneys not paid when due as provided in Article 14 of the General Conditions shall bear interest at the rate established by the Local Government Investment Pool for the period when the money was due.

ARTICLE 8 – CONTRACTOR'S REPRESENTATIONS

- 8.01 In order to induce Owner to enter into this Agreement, Contractor makes the following representations:
 - A. Contractor has examined and carefully studied the Contract Documents and the other related data identified in the Bidding Documents.
 - B. Contractor has visited the Site and become familiar with and is satisfied as to the general, local, and Site conditions that may affect cost, progress, and performance of the Work.
 - C. Contractor is familiar with and is satisfied as to all federal, state, and local Laws and Regulations that may affect cost, progress, and performance of the Work.
 - D. Contractor has obtained and carefully studied (or assumes responsibility for doing so) all additional or supplementary examinations, investigations, explorations, tests, studies, and data concerning conditions (surface, subsurface, and underground facilities) at or contiguous to the Site which may affect cost, progress, or performance of the Work or which relate to any aspect of the means, methods, techniques, sequences, and procedures of construction to be employed

by the Contractor, including any specific means, methods, techniques, sequences, and procedures of construction expressly required by the Bidding Documents, and safety precautions and programs incident thereto.

- E. Contractor does not consider that further examinations, investigations, explorations, tests, studies, or data are necessary for the performance of the Work at the Contract Price, within the Contract Times, and in accordance with the other terms and conditions of the Contract Documents.
- F. Contractor has correlated the information known to Contractor, information and observations obtained from visits to the Site, reports and drawings identified in the Contract Documents, and all additional examinations, investigations, explorations, tests, studies, and data with the Contract Documents.
- G. Contractor is aware of the general nature of work to be performed by Owner and others at the Site that relates to the Work as indicated in the Contract Documents.
- H. Contractor has given Engineer written notice of all conflicts, errors, ambiguities, or discrepancies that Contractor has discovered in the Contract Documents, and the written resolution thereof by Engineer is acceptable to Contractor.
- I. The Contract Documents are generally sufficient to indicate and convey understanding of all terms and conditions for performance and furnishing of the Work.

ARTICLE 9 – CONTRACT DOCUMENTS

9.01 *Contents*

- A. The Contract Documents consist of the following:
 - 1. This Agreement (pages 1 to , inclusive).
 - 2. Performance bond (pages 1 to , inclusive).
 - 3. Payment bond (pages 1 to , inclusive).
 - 4. Other bonds (pages to , inclusive).
 - a. Bid Bond (pages 1 to , inclusive).
 - 5. General Conditions (pages 1 to , inclusive).
 - 6. Supplementary Conditions (pages to , inclusive).
 - 7. Specifications as listed in the table of contents of the Project Manual.
 - 8. Drawings consisting of sheets with each sheet bearing the following general titles:

Mayfield Regional Detention, Ingleside Ave, Athens, TN
Regional Park Dredging and Stabilization, Regional Park Drive, Athens, TN
Cook Drive Pond Improvements, Cook Drive, Athens, TN.

9. Addenda (numbers _____ to _____, inclusive).

10. Exhibits to this Agreement (enumerated as follows):

- a. Contractor's Bid (pages _____ to _____, inclusive).
- b. Documentation submitted by Contractor prior to Notice of Award (pages _____ to _____, inclusive).
- c. Installer Certification Information (pages _____ to _____, inclusive).

11. Other Documents.

- a. List of Subcontractors (pages _____ to _____, inclusive).
- b. Statement of Experience of Bidder (pages _____ to _____, inclusive).
- c. Drug-Free Workplace Affidavit of Prime Bidder (pages _____ to _____, inclusive).
- d. Statement of Compliance Certificate - Illegal Immigrants (pages _____ to _____, inclusive).
- e. Notice of Award (pages _____ to _____, inclusive).

12. The following which may be delivered or issued on or after the Effective Date of the Agreement and are not attached hereto:

- a. Notice to Proceed (pages _____ to _____, inclusive).
- b. Work Change Directives.
- c. Change Orders.

B. The documents listed in Paragraph 9.01.A are attached to this Agreement (except as expressly noted otherwise above).

C. There are no Contract Documents other than those listed above in this Article 9.

D. The Contract Documents may only be amended, modified, or supplemented as provided in Paragraph 3.04 of the General Conditions.

ARTICLE 10 – MISCELLANEOUS

10.01 Terms

A. Terms used in this Agreement will have the meanings stated in the General Conditions and the Supplementary Conditions.

10.02 Assignment of Contract

A. No assignment by a party hereto of any rights under or interests in the Contract will be binding on another party hereto without the written consent of the party sought to be bound; and,

specifically but without limitation, moneys that may become due and moneys that are due may not be assigned without such consent (except to the extent that the effect of this restriction may be limited by law), and unless specifically stated to the contrary in any written consent to an assignment, no assignment will release or discharge the assignor from any duty or responsibility under the Contract Documents.

10.03 *Successors and Assigns*

- A. Owner and Contractor each binds itself, its partners, successors, assigns, and legal representatives to the other party hereto, its partners, successors, assigns, and legal representatives in respect to all covenants, agreements, and obligations contained in the Contract Documents.

10.04 *Severability*

- A. Any provision or part of the Contract Documents held to be void or unenforceable under any Law or Regulation shall be deemed stricken, and all remaining provisions shall continue to be valid and binding upon Owner and Contractor, who agree that the Contract Documents shall be reformed to replace such stricken provision or part thereof with a valid and enforceable provision that comes as close as possible to expressing the intention of the stricken provision.

10.05 *Contractor's Certifications*

- A. Contractor certifies that it has not engaged in corrupt, fraudulent, collusive, or coercive practices in competing for or in executing the Contract. For the purposes of this Paragraph 10.05:
 - 1. "corrupt practice" means the offering, giving, receiving, or soliciting of any thing of value likely to influence the action of a public official in the bidding process or in the Contract execution;
 - 2. "fraudulent practice" means an intentional misrepresentation of facts made (a) to influence the bidding process or the execution of the Contract to the detriment of Owner, (b) to establish Bid or Contract prices at artificial non-competitive levels, or (c) to deprive Owner of the benefits of free and open competition;
 - 3. "collusive practice" means a scheme or arrangement between two or more Bidders, with or without the knowledge of Owner, a purpose of which is to establish Bid prices at artificial, non-competitive levels; and
 - 4. "coercive practice" means harming or threatening to harm, directly or indirectly, persons or their property to influence their participation in the bidding process or affect the execution of the Contract.

IN WITNESS WHEREOF, Owner and Contractor have signed this Agreement. Counterparts have been delivered to Owner and Contractor. All portions of the Contract Documents have been signed or have been identified by Owner and Contractor or on their behalf.

This Agreement will be effective on _____, 2025 (which is the Effective Date of the Agreement).

OWNER:

CONTRACTOR:

City of Athens, TN

By: _____

By: _____

Title: _____

Title: _____

(If Contractor is a corporation, a partnership, or a joint venture, attach evidence of authority to sign.)

Attest: _____

Attest: _____

Title: _____

Title: _____

Address for giving notices:

Address for giving notices:

License No.: _____
(Where applicable)

(If Owner is a corporation, attach evidence of authority to sign. If Owner is a public body, attach evidence of authority to sign and resolution or other documents authorizing execution of this Agreement.)

Agent for service of process:

**MAYFIELD REGIONAL DETENTION
REGIONAL PARK DREDGING AND STABILIZATION
COOK DRIVE POND IMPROVEMENTS
ATHENS, TENNESSEE
Gresham Smith Project No.: 46762.02**

**SECTION 00 6100
PERFORMANCE BOND**

- 1.1 THE PERFORMANCE BOND, EJCDC DOCUMENT C-610, 2007 EDITION, FORMS A PART OF THE CONSTRUCTION DOCUMENTS.**

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END OF SECTION 00 6100

PERFORMANCE BOND

Any singular reference to Contractor, Surety, Owner, or other party shall be considered plural where applicable.

CONTRACTOR (*Name and Address*): SURETY (*Name, and Address of Principal Place of Business*):

OWNER (*Name and Address*):

CONTRACT

Effective Date of Agreement:

Amount:

Description (*Name and Location*):

BOND

Bond Number:

Date (*Not earlier than Effective Date of Agreement*):

Amount:

Modifications to this Bond Form:

Surety and Contractor, intending to be legally bound hereby, subject to the terms set forth below, do each cause this Performance Bond to be duly executed by an authorized officer, agent, or representative.

CONTRACTOR AS PRINCIPAL

SURETY

Contractor's Name and Corporate Seal

Surety's Name and Corporate Seal

By: _____
Signature

By: _____
Signature (Attach Power of Attorney)

Print Name

Print Name

Title

Title

Attest: _____
Signature

Attest: _____
Signature

Title

Title

Note: Provide execution by additional parties, such as joint venturers, if necessary.

Contractor and Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors, and assigns to Owner for the performance of the Contract, which is incorporated herein by reference.

1. If Contractor performs the Contract, Surety and Contractor have no obligation under this Bond, except to participate in conferences as provided in Paragraph 2.1.
2. If there is no Owner Default, Surety's obligation under this Bond shall arise after:
 - 2.1 Owner has notified Contractor and Surety, at the addresses described in Paragraph 9 below, that Owner is considering declaring a Contractor Default and has requested and attempted to arrange a conference with Contractor and Surety to be held not later than 15 days after receipt of such notice to discuss methods of performing the Contract. If Owner, Contractor, and Surety agree, Contractor shall be allowed a reasonable time to perform the Contract, but such an agreement shall not waive Owner's right, if any, subsequently to declare a Contractor Default; and
 - 2.2 Owner has declared a Contractor Default and formally terminated Contractor's right to complete the Contract. Such Contractor Default shall not be declared earlier than 20 days after Contractor and Surety have received notice as provided in Paragraph 2.1; and
 - 2.3 Owner has agreed to pay the Balance of the Contract Price to:
 1. Surety in accordance with the terms of the Contract; or
 2. Another contractor selected pursuant to Paragraph 3.3 to perform the Contract.
3. When Owner has satisfied the conditions of Paragraph 2, Surety shall promptly, and at Surety's expense, take one of the following actions:
 - 3.1 Arrange for Contractor, with consent of Owner, to perform and complete the Contract; or
 - 3.2 Undertake to perform and complete the Contract itself, through its agents or through independent contractors; or
 - 3.3 Obtain bids or negotiated proposals from qualified contractors acceptable to Owner for a contract for performance and completion of the Contract, arrange for a contract to be prepared for execution by Owner and contractor selected with Owner's concurrence, to be secured with performance and payment bonds executed by a qualified surety equivalent to the bonds issued on the Contract, and pay to Owner the amount of damages as described in Paragraph 5 in excess of the Balance of the Contract Price incurred by Owner resulting from Contractor Default; or
 - 3.4 Waive its right to perform and complete, arrange for completion, or obtain a new contractor, and with reasonable promptness under the circumstances:
 1. After investigation, determine the amount for which it may be liable to Owner and, as soon as practicable after the amount is determined, tender payment therefor to Owner; or
 2. Deny liability in whole or in part and notify Owner citing reasons therefor.
4. If Surety does not proceed as provided in Paragraph 3 with reasonable promptness, Surety shall be deemed to be in default on this Bond 15 days after receipt of an additional written notice from Owner to Surety demanding that Surety perform its obligations under this Bond, and Owner shall be entitled to enforce any remedy available to Owner. If Surety proceeds as provided in Paragraph 3.4, and Owner refuses the payment tendered or Surety has denied liability, in whole or in part, without further notice Owner shall be entitled to enforce any remedy available to Owner.
5. After Owner has terminated Contractor's right to complete the Contract, and if Surety elects to act under Paragraph 3.1, 3.2, or 3.3 above, then the responsibilities of Surety to Owner shall not be greater than those of Contractor under the Contract, and the responsibilities of Owner to Surety shall not be greater than those of Owner under the Contract. To the limit of the amount of this Bond, but subject to commitment by Owner of the Balance of the Contract Price to mitigation of costs and damages on the Contract, Surety is obligated without duplication for:

- 5.1 The responsibilities of Contractor for correction of defective Work and completion of the Contract;
- 5.2 Additional legal, design professional, and delay costs resulting from Contractor's Default, and resulting from the actions of or failure to act of Surety under Paragraph 3; and
- 5.3 Liquidated damages, or if no liquidated damages are specified in the Contract, actual damages caused by delayed performance or non-performance of Contractor.

6. Surety shall not be liable to Owner or others for obligations of Contractor that are unrelated to the Contract, and the Balance of the Contract Price shall not be reduced or set off on account of any such unrelated obligations. No right of action shall accrue on this Bond to any person or entity other than Owner or its heirs, executors, administrators, or successors.

7. Surety hereby waives notice of any change, including changes of time, to Contract or to related subcontracts, purchase orders, and other obligations.

8. Any proceeding, legal or equitable, under this Bond may be instituted in any court of competent jurisdiction in the location in which the Work or part of the Work is located, and shall be instituted within two years after Contractor Default or within two years after Contractor ceased working or within two years after Surety refuses or fails to perform its obligations under this Bond, whichever occurs first. If the provisions of this paragraph are void or prohibited by law, the minimum period of limitation available to sureties as a defense in the jurisdiction of the suit shall be applicable.

9. Notice to Surety, Owner, or Contractor shall be mailed or delivered to the address shown on the signature page.

10. When this Bond has been furnished to comply with a statutory requirement in the location where the Contract was to be performed, any provision in this Bond conflicting with said statutory requirement shall be deemed deleted here from and provisions conforming to such statutory requirement shall be deemed incorporated herein. The intent is that this Bond shall be construed as a statutory bond and not as a common law bond.

11. Definitions.

- 11.1 Balance of the Contract Price: The total amount payable by Owner to Contractor under the Contract after all proper adjustments have been made, including allowance to Contractor of any amounts received or to be received by Owner in settlement of insurance or other Claims for damages to which Contractor is entitled, reduced by all valid and proper payments made to or on behalf of Contractor under the Contract.
- 11.2 Contract: The agreement between Owner and Contractor identified on the signature page, including all Contract Documents and changes thereto.
- 11.3 Contractor Default: Failure of Contractor, which has neither been remedied nor waived, to perform or otherwise to comply with the terms of the Contract.
- 11.4 Owner Default: Failure of Owner, which has neither been remedied nor waived, to pay Contractor as required by the Contract or to perform and complete or otherwise comply with the other terms thereof.

FOR INFORMATION ONLY – *(Name, Address and Telephone)*

Surety Agency or Broker:

Owner's Representative *(Engineer or other party)*:

MAYFIELD REGIONAL DETENTION
REGIONAL PARK DREDGING AND STABILIZATION
COOK DRIVE POND IMPROVEMENTS
ATHENS, TENNESSEE
Gresham Smith Project No.: 46762.02

SECTION 00 6150
PAYMENT BOND

- 1.1 THE PAYMENT BOND, EJCDC DOCUMENT C-615, 2007 EDITION, FORMS A PART OF THE CONSTRUCTION DOCUMENTS.

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END OF SECTION 00 6150

PAYMENT BOND

Any singular reference to Contractor, Surety, Owner, or other party shall be considered plural where applicable.

CONTRACTOR (*Name and Address*):

SURETY (*Name, and Address of Principal Place of Business*):

OWNER (*Name and Address*):

CONTRACT

Effective Date of Agreement:

Amount:

Description (*Name and Location*):

BOND

Bond Number:

Date (*Not earlier than Effective Date of Agreement*):

Amount:

Modifications to this Bond Form:

Surety and Contractor, intending to be legally bound hereby, subject to the terms set forth below, do each cause this Payment Bond to be duly executed by an authorized officer, agent, or representative.

CONTRACTOR AS PRINCIPAL

SURETY

Contractor's Name and Corporate Seal

Surety's Name and Corporate Seal

By: _____
Signature

By: _____
Signature (Attach Power of Attorney)

Print Name

Print Name

Title

Title

Attest: _____
Signature

Attest: _____
Signature

Title

Title

Note: Provide execution by additional parties, such as joint venturers, if necessary.

1. Contractor and Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors, and assigns to Owner to pay for labor, materials, and equipment furnished by Claimants for use in the performance of the Contract, which is incorporated herein by reference.
2. With respect to Owner, this obligation shall be null and void if Contractor:
 - 2.1 Promptly makes payment, directly or indirectly, for all sums due Claimants, and
 - 2.2 Defends, indemnifies, and holds harmless Owner from all claims, demands, liens, or suits alleging non-payment by Contractor by any person or entity who furnished labor, materials, or equipment for use in the performance of the Contract, provided Owner has promptly notified Contractor and Surety (at the addresses described in Paragraph 12) of any claims, demands, liens, or suits and tendered defense of such claims, demands, liens, or suits to Contractor and Surety, and provided there is no Owner Default.
3. With respect to Claimants, this obligation shall be null and void if Contractor promptly makes payment, directly or indirectly, for all sums due.
4. Surety shall have no obligation to Claimants under this Bond until:
 - 4.1 Claimants who are employed by or have a direct contract with Contractor have given notice to Surety (at the address described in Paragraph 12) and sent a copy, or notice thereof, to Owner, stating that a claim is being made under this Bond and, with substantial accuracy, the amount of the claim.
 - 4.2 Claimants who do not have a direct contract with Contractor:
 1. Have furnished written notice to Contractor and sent a copy, or notice thereof, to Owner, within 90 days after having last performed labor or last furnished materials or equipment included in the claim stating, with substantial accuracy, the amount of the claim and the name of the party to whom the materials or equipment were furnished or supplied, or for whom the labor was done or performed; and
 2. Have either received a rejection in whole or in part from Contractor, or not received within 30 days of furnishing the above notice any communication from Contractor by which Contractor had indicated the claim will be paid directly or indirectly; and
 3. Not having been paid within the above 30 days, have sent a written notice to Surety (at the address described in Paragraph 12) and sent a copy, or notice thereof, to Owner, stating that a claim is being made under this Bond and enclosing a copy of the previous written notice furnished to Contractor.
5. If a notice by a Claimant required by Paragraph 4 is provided by Owner to Contractor or to Surety, that is sufficient compliance.
6. When a Claimant has satisfied the conditions of Paragraph 4, the Surety shall promptly and at Surety's expense take the following actions:
 - 6.1 Send an answer to that Claimant, with a copy to Owner, within 45 days after receipt of the claim, stating the amounts that are undisputed and the basis for challenging any amounts that are disputed.
 - 6.2 Pay or arrange for payment of any undisputed amounts.
7. Surety's total obligation shall not exceed the amount of this Bond, and the amount of this Bond shall be credited for any payments made in good faith by Surety.
8. Amounts owed by Owner to Contractor under the Contract shall be used for the performance of the Contract and to satisfy claims, if any, under any performance bond. By Contractor furnishing and Owner accepting this Bond, they agree that all funds earned by Contractor in the performance of the Contract are dedicated to satisfy obligations of Contractor and Surety under this Bond, subject to Owner's priority to use the funds for the completion of the Work.

9. Surety shall not be liable to Owner, Claimants, or others for obligations of Contractor that are unrelated to the Contract. Owner shall not be liable for payment of any costs or expenses of any Claimant under this Bond, and shall have under this Bond no obligations to make payments to, give notices on behalf of, or otherwise have obligations to Claimants under this Bond.

10. Surety hereby waives notice of any change, including changes of time, to the Contract or to related subcontracts, purchase orders, and other obligations.

11. No suit or action shall be commenced by a Claimant under this Bond other than in a court of competent jurisdiction in the location in which the Work or part of the Work is located or after the expiration of one year from the date (1) on which the Claimant gave the notice required by Paragraph 4.1 or Paragraph 4.2.3, or (2) on which the last labor or service was performed by anyone or the last materials or equipment were furnished by anyone under the Contract, whichever of (1) or (2) first occurs. If the provisions of this paragraph are void or prohibited by law, the minimum period of limitation available to sureties as a defense in the jurisdiction of the suit shall be applicable.

12. Notice to Surety, Owner, or Contractor shall be mailed or delivered to the addresses shown on the signature page. Actual receipt of notice by Surety, Owner, or Contractor, however accomplished, shall be sufficient compliance as of the date received at the address shown on the signature page.

13. When this Bond has been furnished to comply with a statutory requirement in the location where the Contract was to be performed, any provision in this Bond conflicting with said statutory requirement shall be deemed deleted herefrom and provisions conforming to such statutory requirement shall be deemed incorporated herein. The intent is that this Bond shall be construed as a statutory Bond and not as a common law bond.

14. Upon request of any person or entity appearing to be a potential beneficiary of this Bond, Contractor shall promptly furnish a copy of this Bond or shall permit a copy to be made.

15. Definitions

15.1 Claimant: An individual or entity having a direct contract with Contractor, or with a first-tier subcontractor of Contractor, to furnish labor, materials, or equipment for use in the performance of the Contract. The intent of this Bond shall be to include without limitation in the terms "labor, materials or equipment" that part of water, gas, power, light, heat, oil, gasoline, telephone service, or rental equipment used in the Contract, architectural and engineering services required for performance of the Work of Contractor and Contractor's subcontractors, and all other items for which a mechanic's lien may be asserted in the jurisdiction where the labor, materials, or equipment were furnished.

15.2 Contract: The agreement between Owner and Contractor identified on the signature page, including all Contract Documents and changes thereto.

15.3 Owner Default: Failure of Owner, which has neither been remedied nor waived, to pay Contractor as required by the Contract, or to perform and complete or otherwise comply with the other terms thereof.

FOR INFORMATION ONLY – (*Name, Address, and Telephone*)

Surety Agency or Broker:

Owner's Representative (*Engineer or other*):

MAYFIELD REGIONAL DETENTION
REGIONAL PARK DREDGING AND STABILIZATION
COOK DRIVE POND IMPROVEMENTS
ATHENS, TENNESSEE
Gresham Smith Project No.: 46762.02

SECTION 00 6200
APPLICATION FOR PAYMENT FORM - EJDC C-620 2007

- 1.1 THE CONTRACTOR'S APPLICATION FOR PAYMENT, EJDC DOCUMENT C-620, 2007 EDITION,
FORMS A PART OF THE CONSTRUCTION DOCUMENTS.

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END OF SECTION 00 6200

Contractor's Application for Payment No.

		Application Period:	Application Date:
To (Owner):	From (Contractor):	Via (Engineer):	
Project:	Contract:		
Owner's Contract No.:	Contractor's Project No.:	Engineer's Project No.:	

Application For Payment Change Order Summary

Approved Change Orders			
Number	Additions	Deductions	
			1. ORIGINAL CONTRACT PRICE..... \$ _____
			2. Net change by Change Orders..... \$ _____
			3. Current Contract Price (Line 1 ± 2)..... \$ _____
			4. TOTAL COMPLETED AND STORED TO DATE
			(Column F on Progress Estimate)..... \$ _____
			5. RETAINAGE:
			a. X _____ Work Completed..... \$ _____
			b. X _____ Stored Material..... \$ _____
			c. Total Retainage (Line 5a + Line 5b)..... \$ _____
			6. AMOUNT ELIGIBLE TO DATE (Line 4 - Line 5c)..... \$ _____
			7. LESS PREVIOUS PAYMENTS (Line 6 from prior Application)..... \$ _____
			8. AMOUNT DUE THIS APPLICATION..... \$ _____
			9. BALANCE TO FINISH, PLUS RETAINAGE
			(Column G on Progress Estimate + Line 5 above)..... \$ _____
TOTALS			
NET CHANGE BY			
CHANGE ORDERS			

Contractor's Certification

The undersigned Contractor certifies that to the best of its knowledge: (1) all previous progress payments received from Owner on account of Work done under the Contract have been applied on account to discharge Contractor's legitimate obligations incurred in connection with Work covered by prior Applications for Payment; (2) title of all Work, materials and equipment incorporated in said Work or otherwise listed in or covered by this Application for Payment will pass to Owner at time of payment free and clear of all Liens, security interests and encumbrances (except such as are covered by a Bond acceptable to Owner indemnifying Owner against any such Liens, security interest or encumbrances); and (3) all Work covered by this Application for Payment is in accordance with the Contract Documents and is not defective.

By:

Date:

Payment of: \$ _____
(Line 8 or other - attach explanation of the other amount)

is recommended by: _____ (Date)
(Engineer)

Payment of: \$ _____
(Line 8 or other - attach explanation of the other amount)

is approved by: _____ (Date)
(Owner)

Approved by: _____ (Date)
Funding Agency (if applicable)

Endorsed by the Construction Specifications Institute.

Progress Estimate

Contractor's Application

For (contract):				Application Number:				
Application Period:				Application Date:				
A		B	Work Completed		E	F		G
Item		Scheduled Value	C	D	Materials Presently Stored (not in C or D)	Total Completed and Stored to Date (C + D + E)	% (E) B	Balance to Finish (B - F)
Specification Section No.	Description		From Previous Application (C+D)	This Period				
Totals								

Progress Estimate

Contractor's Application

For (contract):							Application Number:			
Application Period:							Application Date:			
A				B	C	D	E	F		
Item		Bid Quantity	Unit Price	Bid Value	Estimated Quantity Installed	Value	Materials Presently Stored (not in C)	Total Completed and Stored to Date (D + E)	% (F) B	Balance to Finish (B - F)
Bid Item No.	Description									
Totals										

Stored Material Summary

Contractor's Application

For (contract):						Application Number:			
Application Period:						Application Date:			
A	B	C	D		E		F		G
Invoice No.	Shop Drawing Transmittal No.	Materials Description	Stored Previously		Stored this Month		Incorporated in Work		Materials Remaining in Storage (\$) (D + E - F)
			Date (Month/Year)	Amount (\$)	Amount (\$)	Subtotal	Date (Month/Year)	Amount (\$)	
Totals									

**MAYFIELD REGIONAL DETENTION
REGIONAL PARK DREDGING AND STABILIZATION
COOK DRIVE POND IMPROVEMENTS
ATHENS, TENNESSEE
Gresham Smith Project No.: 46762.02**

**SECTION 00 7200
GENERAL CONDITIONS**

The "Standard General Conditions of the Construction Contract", EJCDC Document C-700, 2007 Edition, forms a part of the Construction Documents and is attached.

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END OF SECTION 00 7200

This document has important legal consequences; consultation with an attorney is encouraged with respect to its use or modification. This document should be adapted to the particular circumstances of the contemplated Project and the controlling Laws and Regulations.

STANDARD GENERAL CONDITIONS OF THE CONSTRUCTION CONTRACT

Prepared by

ENGINEERS JOINT CONTRACT DOCUMENTS COMMITTEE

and

Issued and Published Jointly by



AMERICAN COUNCIL OF ENGINEERING COMPANIES

ASSOCIATED GENERAL CONTRACTORS OF AMERICA

AMERICAN SOCIETY OF CIVIL ENGINEERS

PROFESSIONAL ENGINEERS IN PRIVATE PRACTICE
A Practice Division of the
NATIONAL SOCIETY OF PROFESSIONAL ENGINEERS

Endorsed by



CONSTRUCTION SPECIFICATIONS INSTITUTE

These General Conditions have been prepared for use with the Suggested Forms of Agreement Between Owner and Contractor (EJCDC C-520 or C-525, 2007 Editions). Their provisions are interrelated and a

change in one may necessitate a change in the other. Comments concerning their usage are contained in the Narrative Guide to the EJCDC Construction Documents (EJCDC C-001, 2007 Edition). For guidance in the preparation of Supplementary Conditions, see Guide to the Preparation of Supplementary Conditions (EJCDC C-800, 2007 Edition).

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STANDARD GENERAL CONDITIONS OF THE CONSTRUCTION CONTRACT

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ARTICLE 1 – DEFINITIONS AND TERMINOLOGY

1.01 *Defined Terms*

- A. Wherever used in the Bidding Requirements or Contract Documents and printed with initial capital letters, the terms listed below will have the meanings indicated which are applicable to both the singular and plural thereof. In addition to terms specifically defined, terms with initial capital letters in the Contract Documents include references to identified articles and paragraphs, and the titles of other documents or forms.
1. *Addenda*—Written or graphic instruments issued prior to the opening of Bids which clarify, correct, or change the Bidding Requirements or the proposed Contract Documents.
 2. *Agreement*—The written instrument which is evidence of the agreement between Owner and Contractor covering the Work.
 3. *Application for Payment*—The form acceptable to Engineer which is to be used by Contractor during the course of the Work in requesting progress or final payments and which is to be accompanied by such supporting documentation as is required by the Contract Documents.
 4. *Asbestos*—Any material that contains more than one percent asbestos and is friable or is releasing asbestos fibers into the air above current action levels established by the United States Occupational Safety and Health Administration.
 5. *Bid*—The offer or proposal of a Bidder submitted on the prescribed form setting forth the prices for the Work to be performed.
 6. *Bidder*—The individual or entity who submits a Bid directly to Owner.
 7. *Bidding Documents*—The Bidding Requirements and the proposed Contract Documents (including all Addenda).
 8. *Bidding Requirements*—The advertisement or invitation to bid, Instructions to Bidders, Bid security of acceptable form, if any, and the Bid Form with any supplements.
 9. *Change Order*—A document recommended by Engineer which is signed by Contractor and Owner and authorizes an addition, deletion, or revision in the Work or an adjustment in the Contract Price or the Contract Times, issued on or after the Effective Date of the Agreement.
 10. *Claim*—A demand or assertion by Owner or Contractor seeking an adjustment of Contract Price or Contract Times, or both, or other relief with respect to the terms of the Contract. A demand for money or services by a third party is not a Claim.
 11. *Contract*—The entire and integrated written agreement between the Owner and Contractor concerning the Work. The Contract supersedes prior negotiations, representations, or agreements, whether written or oral.

12. *Contract Documents*—Those items so designated in the Agreement. Only printed or hard copies of the items listed in the Agreement are Contract Documents. Approved Shop Drawings, other Contractor submittals, and the reports and drawings of subsurface and physical conditions are not Contract Documents.
13. *Contract Price*—The moneys payable by Owner to Contractor for completion of the Work in accordance with the Contract Documents as stated in the Agreement (subject to the provisions of Paragraph 11.03 in the case of Unit Price Work).
14. *Contract Times*—The number of days or the dates stated in the Agreement to: (i) achieve Milestones, if any; (ii) achieve Substantial Completion; and (iii) complete the Work so that it is ready for final payment as evidenced by Engineer's written recommendation of final payment.
15. *Contractor*—The individual or entity with whom Owner has entered into the Agreement.
16. *Cost of the Work*—See Paragraph 11.01 for definition.
17. *Drawings*—That part of the Contract Documents prepared or approved by Engineer which graphically shows the scope, extent, and character of the Work to be performed by Contractor. Shop Drawings and other Contractor submittals are not Drawings as so defined.
18. *Effective Date of the Agreement*—The date indicated in the Agreement on which it becomes effective, but if no such date is indicated, it means the date on which the Agreement is signed and delivered by the last of the two parties to sign and deliver.
19. *Engineer*—The individual or entity named as such in the Agreement.
20. *Field Order*—A written order issued by Engineer which requires minor changes in the Work but which does not involve a change in the Contract Price or the Contract Times.
21. *General Requirements*—Sections of Division 1 of the Specifications.
22. *Hazardous Environmental Condition*—The presence at the Site of Asbestos, PCBs, Petroleum, Hazardous Waste, or Radioactive Material in such quantities or circumstances that may present a substantial danger to persons or property exposed thereto.
23. *Hazardous Waste*—The term Hazardous Waste shall have the meaning provided in Section 1004 of the Solid Waste Disposal Act (42 USC Section 6903) as amended from time to time.
24. *Laws and Regulations; Laws or Regulations*—Any and all applicable laws, rules, regulations, ordinances, codes, and orders of any and all governmental bodies, agencies, authorities, and courts having jurisdiction.
25. *Liens*—Charges, security interests, or encumbrances upon Project funds, real property, or personal property.
26. *Milestone*—A principal event specified in the Contract Documents relating to an intermediate completion date or time prior to Substantial Completion of all the Work.

27. *Notice of Award*—The written notice by Owner to the Successful Bidder stating that upon timely compliance by the Successful Bidder with the conditions precedent listed therein, Owner will sign and deliver the Agreement.
28. *Notice to Proceed*—A written notice given by Owner to Contractor fixing the date on which the Contract Times will commence to run and on which Contractor shall start to perform the Work under the Contract Documents.
29. *Owner*—The individual or entity with whom Contractor has entered into the Agreement and for whom the Work is to be performed.
30. *PCBs*—Polychlorinated biphenyls.
31. *Petroleum*—Petroleum, including crude oil or any fraction thereof which is liquid at standard conditions of temperature and pressure (60 degrees Fahrenheit and 14.7 pounds per square inch absolute), such as oil, petroleum, fuel oil, oil sludge, oil refuse, gasoline, kerosene, and oil mixed with other non-Hazardous Waste and crude oils.
32. *Progress Schedule*—A schedule, prepared and maintained by Contractor, describing the sequence and duration of the activities comprising the Contractor's plan to accomplish the Work within the Contract Times.
33. *Project*—The total construction of which the Work to be performed under the Contract Documents may be the whole, or a part.
34. *Project Manual*—The bound documentary information prepared for bidding and constructing the Work. A listing of the contents of the Project Manual, which may be bound in one or more volumes, is contained in the table(s) of contents.
35. *Radioactive Material*—Source, special nuclear, or byproduct material as defined by the Atomic Energy Act of 1954 (42 USC Section 2011 et seq.) as amended from time to time.
36. *Resident Project Representative*—The authorized representative of Engineer who may be assigned to the Site or any part thereof.
37. *Samples*—Physical examples of materials, equipment, or workmanship that are representative of some portion of the Work and which establish the standards by which such portion of the Work will be judged.
38. *Schedule of Submittals*—A schedule, prepared and maintained by Contractor, of required submittals and the time requirements to support scheduled performance of related construction activities.
39. *Schedule of Values*—A schedule, prepared and maintained by Contractor, allocating portions of the Contract Price to various portions of the Work and used as the basis for reviewing Contractor's Applications for Payment.
40. *Shop Drawings*—All drawings, diagrams, illustrations, schedules, and other data or information which are specifically prepared or assembled by or for Contractor and submitted by Contractor to illustrate some portion of the Work.

41. *Site*—Lands or areas indicated in the Contract Documents as being furnished by Owner upon which the Work is to be performed, including rights-of-way and easements for access thereto, and such other lands furnished by Owner which are designated for the use of Contractor.
42. *Specifications*—That part of the Contract Documents consisting of written requirements for materials, equipment, systems, standards and workmanship as applied to the Work, and certain administrative requirements and procedural matters applicable thereto.
43. *Subcontractor*—An individual or entity having a direct contract with Contractor or with any other Subcontractor for the performance of a part of the Work at the Site.
44. *Substantial Completion*—The time at which the Work (or a specified part thereof) has progressed to the point where, in the opinion of Engineer, the Work (or a specified part thereof) is sufficiently complete, in accordance with the Contract Documents, so that the Work (or a specified part thereof) can be utilized for the purposes for which it is intended. The terms “substantially complete” and “substantially completed” as applied to all or part of the Work refer to Substantial Completion thereof.
45. *Successful Bidder*—The Bidder submitting a responsive Bid to whom Owner makes an award.
46. *Supplementary Conditions*—That part of the Contract Documents which amends or supplements these General Conditions.
47. *Supplier*—A manufacturer, fabricator, supplier, distributor, materialman, or vendor having a direct contract with Contractor or with any Subcontractor to furnish materials or equipment to be incorporated in the Work by Contractor or Subcontractor.
48. *Underground Facilities*—All underground pipelines, conduits, ducts, cables, wires, manholes, vaults, tanks, tunnels, or other such facilities or attachments, and any encasements containing such facilities, including those that convey electricity, gases, steam, liquid petroleum products, telephone or other communications, cable television, water, wastewater, storm water, other liquids or chemicals, or traffic or other control systems.
49. *Unit Price Work*—Work to be paid for on the basis of unit prices.
50. *Work*—The entire construction or the various separately identifiable parts thereof required to be provided under the Contract Documents. Work includes and is the result of performing or providing all labor, services, and documentation necessary to produce such construction, and furnishing, installing, and incorporating all materials and equipment into such construction, all as required by the Contract Documents.
51. *Work Change Directive*—A written statement to Contractor issued on or after the Effective Date of the Agreement and signed by Owner and recommended by Engineer ordering an addition, deletion, or revision in the Work, or responding to differing or unforeseen subsurface or physical conditions under which the Work is to be performed or to emergencies. A Work Change Directive will not change the Contract Price or the Contract Times but is evidence that the parties expect that the change ordered or documented by a

Work Change Directive will be incorporated in a subsequently issued Change Order following negotiations by the parties as to its effect, if any, on the Contract Price or Contract Times.

1.02 *Terminology*

A. The words and terms discussed in Paragraph 1.02.B through F are not defined but, when used in the Bidding Requirements or Contract Documents, have the indicated meaning.

B. *Intent of Certain Terms or Adjectives:*

1. The Contract Documents include the terms “as allowed,” “as approved,” “as ordered,” “as directed” or terms of like effect or import to authorize an exercise of professional judgment by Engineer. In addition, the adjectives “reasonable,” “suitable,” “acceptable,” “proper,” “satisfactory,” or adjectives of like effect or import are used to describe an action or determination of Engineer as to the Work. It is intended that such exercise of professional judgment, action, or determination will be solely to evaluate, in general, the Work for compliance with the information in the Contract Documents and with the design concept of the Project as a functioning whole as shown or indicated in the Contract Documents (unless there is a specific statement indicating otherwise). The use of any such term or adjective is not intended to and shall not be effective to assign to Engineer any duty or authority to supervise or direct the performance of the Work, or any duty or authority to undertake responsibility contrary to the provisions of Paragraph 9.09 or any other provision of the Contract Documents.

C. *Day:*

1. The word “day” means a calendar day of 24 hours measured from midnight to the next midnight.

D. *Defective:*

1. The word “defective,” when modifying the word “Work,” refers to Work that is unsatisfactory, faulty, or deficient in that it:
 - a. does not conform to the Contract Documents; or
 - b. does not meet the requirements of any applicable inspection, reference standard, test, or approval referred to in the Contract Documents; or
 - c. has been damaged prior to Engineer’s recommendation of final payment (unless responsibility for the protection thereof has been assumed by Owner at Substantial Completion in accordance with Paragraph 14.04 or 14.05).

E. *Furnish, Install, Perform, Provide:*

1. The word “furnish,” when used in connection with services, materials, or equipment, shall mean to supply and deliver said services, materials, or equipment to the Site (or some other specified location) ready for use or installation and in usable or operable condition.

2. The word “install,” when used in connection with services, materials, or equipment, shall mean to put into use or place in final position said services, materials, or equipment complete and ready for intended use.
 3. The words “perform” or “provide,” when used in connection with services, materials, or equipment, shall mean to furnish and install said services, materials, or equipment complete and ready for intended use.
 4. When “furnish,” “install,” “perform,” or “provide” is not used in connection with services, materials, or equipment in a context clearly requiring an obligation of Contractor, “provide” is implied.
- F. Unless stated otherwise in the Contract Documents, words or phrases that have a well-known technical or construction industry or trade meaning are used in the Contract Documents in accordance with such recognized meaning.

ARTICLE 2 – PRELIMINARY MATTERS

2.01 *Delivery of Bonds and Evidence of Insurance*

- A. When Contractor delivers the executed counterparts of the Agreement to Owner, Contractor shall also deliver to Owner such bonds as Contractor may be required to furnish.
- B. *Evidence of Insurance:* Before any Work at the Site is started, Contractor and Owner shall each deliver to the other, with copies to each additional insured identified in the Supplementary Conditions, certificates of insurance (and other evidence of insurance which either of them or any additional insured may reasonably request) which Contractor and Owner respectively are required to purchase and maintain in accordance with Article 5.

2.02 *Copies of Documents*

- A. Owner shall furnish to Contractor up to ten printed or hard copies of the Drawings and Project Manual. Additional copies will be furnished upon request at the cost of reproduction.

2.03 *Commencement of Contract Times; Notice to Proceed*

- A. The Contract Times will commence to run on the thirtieth day after the Effective Date of the Agreement or, if a Notice to Proceed is given, on the day indicated in the Notice to Proceed. A Notice to Proceed may be given at any time within 30 days after the Effective Date of the Agreement. In no event will the Contract Times commence to run later than the sixtieth day after the day of Bid opening or the thirtieth day after the Effective Date of the Agreement, whichever date is earlier.

2.04 *Starting the Work*

- A. Contractor shall start to perform the Work on the date when the Contract Times commence to run. No Work shall be done at the Site prior to the date on which the Contract Times commence to run.

2.05 *Before Starting Construction*

- A. *Preliminary Schedules:* Within 10 days after the Effective Date of the Agreement (unless otherwise specified in the General Requirements), Contractor shall submit to Engineer for timely review:
1. a preliminary Progress Schedule indicating the times (numbers of days or dates) for starting and completing the various stages of the Work, including any Milestones specified in the Contract Documents;
 2. a preliminary Schedule of Submittals; and
 3. a preliminary Schedule of Values for all of the Work which includes quantities and prices of items which when added together equal the Contract Price and subdivides the Work into component parts in sufficient detail to serve as the basis for progress payments during performance of the Work. Such prices will include an appropriate amount of overhead and profit applicable to each item of Work.

2.06 *Preconstruction Conference; Designation of Authorized Representatives*

- A. Before any Work at the Site is started, a conference attended by Owner, Contractor, Engineer, and others as appropriate will be held to establish a working understanding among the parties as to the Work and to discuss the schedules referred to in Paragraph 2.05.A, procedures for handling Shop Drawings and other submittals, processing Applications for Payment, and maintaining required records.
- B. At this conference Owner and Contractor each shall designate, in writing, a specific individual to act as its authorized representative with respect to the services and responsibilities under the Contract. Such individuals shall have the authority to transmit instructions, receive information, render decisions relative to the Contract, and otherwise act on behalf of each respective party.

2.07 *Initial Acceptance of Schedules*

- A. At least 10 days before submission of the first Application for Payment a conference attended by Contractor, Engineer, and others as appropriate will be held to review for acceptability to Engineer as provided below the schedules submitted in accordance with Paragraph 2.05.A. Contractor shall have an additional 10 days to make corrections and adjustments and to complete and resubmit the schedules. No progress payment shall be made to Contractor until acceptable schedules are submitted to Engineer.
1. The Progress Schedule will be acceptable to Engineer if it provides an orderly progression of the Work to completion within the Contract Times. Such acceptance will not impose on Engineer responsibility for the Progress Schedule, for sequencing, scheduling, or progress of the Work, nor interfere with or relieve Contractor from Contractor's full responsibility therefor.
 2. Contractor's Schedule of Submittals will be acceptable to Engineer if it provides a workable arrangement for reviewing and processing the required submittals.

3. Contractor's Schedule of Values will be acceptable to Engineer as to form and substance if it provides a reasonable allocation of the Contract Price to component parts of the Work.

ARTICLE 3 – CONTRACT DOCUMENTS: INTENT, AMENDING, REUSE

3.01 *Intent*

- A. The Contract Documents are complementary; what is required by one is as binding as if required by all.
- B. It is the intent of the Contract Documents to describe a functionally complete project (or part thereof) to be constructed in accordance with the Contract Documents. Any labor, documentation, services, materials, or equipment that reasonably may be inferred from the Contract Documents or from prevailing custom or trade usage as being required to produce the indicated result will be provided whether or not specifically called for, at no additional cost to Owner.
- C. Clarifications and interpretations of the Contract Documents shall be issued by Engineer as provided in Article 9.

3.02 *Reference Standards*

- A. Standards, Specifications, Codes, Laws, and Regulations
 1. Reference to standards, specifications, manuals, or codes of any technical society, organization, or association, or to Laws or Regulations, whether such reference be specific or by implication, shall mean the standard, specification, manual, code, or Laws or Regulations in effect at the time of opening of Bids (or on the Effective Date of the Agreement if there were no Bids), except as may be otherwise specifically stated in the Contract Documents.
 2. No provision of any such standard, specification, manual, or code, or any instruction of a Supplier, shall be effective to change the duties or responsibilities of Owner, Contractor, or Engineer, or any of their subcontractors, consultants, agents, or employees, from those set forth in the Contract Documents. No such provision or instruction shall be effective to assign to Owner, Engineer, or any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors, any duty or authority to supervise or direct the performance of the Work or any duty or authority to undertake responsibility inconsistent with the provisions of the Contract Documents.

3.03 *Reporting and Resolving Discrepancies*

A. *Reporting Discrepancies:*

1. *Contractor's Review of Contract Documents Before Starting Work:* Before undertaking each part of the Work, Contractor shall carefully study and compare the Contract Documents and check and verify pertinent figures therein and all applicable field measurements. Contractor shall promptly report in writing to Engineer any conflict, error, ambiguity, or discrepancy which Contractor discovers, or has actual knowledge of, and shall obtain a written interpretation or clarification from Engineer before proceeding with any Work affected thereby.

2. *Contractor's Review of Contract Documents During Performance of Work:* If, during the performance of the Work, Contractor discovers any conflict, error, ambiguity, or discrepancy within the Contract Documents, or between the Contract Documents and (a) any applicable Law or Regulation, (b) any standard, specification, manual, or code, or (c) any instruction of any Supplier, then Contractor shall promptly report it to Engineer in writing. Contractor shall not proceed with the Work affected thereby (except in an emergency as required by Paragraph 6.16.A) until an amendment or supplement to the Contract Documents has been issued by one of the methods indicated in Paragraph 3.04.
3. Contractor shall not be liable to Owner or Engineer for failure to report any conflict, error, ambiguity, or discrepancy in the Contract Documents unless Contractor had actual knowledge thereof.

B. Resolving Discrepancies:

1. Except as may be otherwise specifically stated in the Contract Documents, the provisions of the Contract Documents shall take precedence in resolving any conflict, error, ambiguity, or discrepancy between the provisions of the Contract Documents and:
 - a. the provisions of any standard, specification, manual, or code, or the instruction of any Supplier (whether or not specifically incorporated by reference in the Contract Documents); or
 - b. the provisions of any Laws or Regulations applicable to the performance of the Work (unless such an interpretation of the provisions of the Contract Documents would result in violation of such Law or Regulation).

3.04 Amending and Supplementing Contract Documents

- A. The Contract Documents may be amended to provide for additions, deletions, and revisions in the Work or to modify the terms and conditions thereof by either a Change Order or a Work Change Directive.
- B. The requirements of the Contract Documents may be supplemented, and minor variations and deviations in the Work may be authorized, by one or more of the following ways:
 1. A Field Order;
 2. Engineer's approval of a Shop Drawing or Sample (subject to the provisions of Paragraph 6.17.D.3); or
 3. Engineer's written interpretation or clarification.

3.05 Reuse of Documents

- A. Contractor and any Subcontractor or Supplier shall not:
 1. have or acquire any title to or ownership rights in any of the Drawings, Specifications, or other documents (or copies of any thereof) prepared by or bearing the seal of Engineer or its consultants, including electronic media editions; or

2. reuse any such Drawings, Specifications, other documents, or copies thereof on extensions of the Project or any other project without written consent of Owner and Engineer and specific written verification or adaptation by Engineer.
- B. The prohibitions of this Paragraph 3.05 will survive final payment, or termination of the Contract. Nothing herein shall preclude Contractor from retaining copies of the Contract Documents for record purposes.

3.06 *Electronic Data*

- A. Unless otherwise stated in the Supplementary Conditions, the data furnished by Owner or Engineer to Contractor, or by Contractor to Owner or Engineer, that may be relied upon are limited to the printed copies (also known as hard copies). Files in electronic media format of text, data, graphics, or other types are furnished only for the convenience of the receiving party. Any conclusion or information obtained or derived from such electronic files will be at the user's sole risk. If there is a discrepancy between the electronic files and the hard copies, the hard copies govern.
- B. Because data stored in electronic media format can deteriorate or be modified inadvertently or otherwise without authorization of the data's creator, the party receiving electronic files agrees that it will perform acceptance tests or procedures within 60 days, after which the receiving party shall be deemed to have accepted the data thus transferred. Any errors detected within the 60-day acceptance period will be corrected by the transferring party.
- C. When transferring documents in electronic media format, the transferring party makes no representations as to long term compatibility, usability, or readability of documents resulting from the use of software application packages, operating systems, or computer hardware differing from those used by the data's creator.

ARTICLE 4 – AVAILABILITY OF LANDS; SUBSURFACE AND PHYSICAL CONDITIONS; HAZARDOUS ENVIRONMENTAL CONDITIONS; REFERENCE POINTS

4.01 *Availability of Lands*

- A. Owner shall furnish the Site. Owner shall notify Contractor of any encumbrances or restrictions not of general application but specifically related to use of the Site with which Contractor must comply in performing the Work. Owner will obtain in a timely manner and pay for easements for permanent structures or permanent changes in existing facilities. If Contractor and Owner are unable to agree on entitlement to or on the amount or extent, if any, of any adjustment in the Contract Price or Contract Times, or both, as a result of any delay in Owner's furnishing the Site or a part thereof, Contractor may make a Claim therefor as provided in Paragraph 10.05.
- B. Upon reasonable written request, Owner shall furnish Contractor with a current statement of record legal title and legal description of the lands upon which the Work is to be performed and Owner's interest therein as necessary for giving notice of or filing a mechanic's or construction lien against such lands in accordance with applicable Laws and Regulations.
- C. Contractor shall provide for all additional lands and access thereto that may be required for temporary construction facilities or storage of materials and equipment.

4.02 *Subsurface and Physical Conditions*

A. *Reports and Drawings:* The Supplementary Conditions identify:

1. those reports known to Owner of explorations and tests of subsurface conditions at or contiguous to the Site; and
2. those drawings known to Owner of physical conditions relating to existing surface or subsurface structures at the Site (except Underground Facilities).

B. *Limited Reliance by Contractor on Technical Data Authorized:* Contractor may rely upon the accuracy of the “technical data” contained in such reports and drawings, but such reports and drawings are not Contract Documents. Such “technical data” is identified in the Supplementary Conditions. Except for such reliance on such “technical data,” Contractor may not rely upon or make any claim against Owner or Engineer, or any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors with respect to:

1. the completeness of such reports and drawings for Contractor’s purposes, including, but not limited to, any aspects of the means, methods, techniques, sequences, and procedures of construction to be employed by Contractor, and safety precautions and programs incident thereto; or
2. other data, interpretations, opinions, and information contained in such reports or shown or indicated in such drawings; or
3. any Contractor interpretation of or conclusion drawn from any “technical data” or any such other data, interpretations, opinions, or information.

4.03 *Differing Subsurface or Physical Conditions*

A. *Notice:* If Contractor believes that any subsurface or physical condition that is uncovered or revealed either:

1. is of such a nature as to establish that any “technical data” on which Contractor is entitled to rely as provided in Paragraph 4.02 is materially inaccurate; or
2. is of such a nature as to require a change in the Contract Documents; or
3. differs materially from that shown or indicated in the Contract Documents; or
4. is of an unusual nature, and differs materially from conditions ordinarily encountered and generally recognized as inherent in work of the character provided for in the Contract Documents;

then Contractor shall, promptly after becoming aware thereof and before further disturbing the subsurface or physical conditions or performing any Work in connection therewith (except in an emergency as required by Paragraph 6.16.A), notify Owner and Engineer in writing about such condition. Contractor shall not further disturb such condition or perform any Work in connection therewith (except as aforesaid) until receipt of written order to do so.

B. *Engineer's Review:* After receipt of written notice as required by Paragraph 4.03.A, Engineer will promptly review the pertinent condition, determine the necessity of Owner's obtaining additional exploration or tests with respect thereto, and advise Owner in writing (with a copy to Contractor) of Engineer's findings and conclusions.

C. *Possible Price and Times Adjustments:*

1. The Contract Price or the Contract Times, or both, will be equitably adjusted to the extent that the existence of such differing subsurface or physical condition causes an increase or decrease in Contractor's cost of, or time required for, performance of the Work; subject, however, to the following:
 - a. such condition must meet any one or more of the categories described in Paragraph 4.03.A; and
 - b. with respect to Work that is paid for on a unit price basis, any adjustment in Contract Price will be subject to the provisions of Paragraphs 9.07 and 11.03.
2. Contractor shall not be entitled to any adjustment in the Contract Price or Contract Times if:
 - a. Contractor knew of the existence of such conditions at the time Contractor made a final commitment to Owner with respect to Contract Price and Contract Times by the submission of a Bid or becoming bound under a negotiated contract; or
 - b. the existence of such condition could reasonably have been discovered or revealed as a result of any examination, investigation, exploration, test, or study of the Site and contiguous areas required by the Bidding Requirements or Contract Documents to be conducted by or for Contractor prior to Contractor's making such final commitment; or
 - c. Contractor failed to give the written notice as required by Paragraph 4.03.A.
3. If Owner and Contractor are unable to agree on entitlement to or on the amount or extent, if any, of any adjustment in the Contract Price or Contract Times, or both, a Claim may be made therefor as provided in Paragraph 10.05. However, neither Owner or Engineer, or any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors shall be liable to Contractor for any claims, costs, losses, or damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) sustained by Contractor on or in connection with any other project or anticipated project.

4.04 *Underground Facilities*

A. *Shown or Indicated:* The information and data shown or indicated in the Contract Documents with respect to existing Underground Facilities at or contiguous to the Site is based on information and data furnished to Owner or Engineer by the owners of such Underground Facilities, including Owner, or by others. Unless it is otherwise expressly provided in the Supplementary Conditions:

1. Owner and Engineer shall not be responsible for the accuracy or completeness of any such information or data provided by others; and

2. the cost of all of the following will be included in the Contract Price, and Contractor shall have full responsibility for:
 - a. reviewing and checking all such information and data;
 - b. locating all Underground Facilities shown or indicated in the Contract Documents;
 - c. coordination of the Work with the owners of such Underground Facilities, including Owner, during construction; and
 - d. the safety and protection of all such Underground Facilities and repairing any damage thereto resulting from the Work.

B. Not Shown or Indicated:

1. If an Underground Facility is uncovered or revealed at or contiguous to the Site which was not shown or indicated, or not shown or indicated with reasonable accuracy in the Contract Documents, Contractor shall, promptly after becoming aware thereof and before further disturbing conditions affected thereby or performing any Work in connection therewith (except in an emergency as required by Paragraph 6.16.A), identify the owner of such Underground Facility and give written notice to that owner and to Owner and Engineer. Engineer will promptly review the Underground Facility and determine the extent, if any, to which a change is required in the Contract Documents to reflect and document the consequences of the existence or location of the Underground Facility. During such time, Contractor shall be responsible for the safety and protection of such Underground Facility.
2. If Engineer concludes that a change in the Contract Documents is required, a Work Change Directive or a Change Order will be issued to reflect and document such consequences. An equitable adjustment shall be made in the Contract Price or Contract Times, or both, to the extent that they are attributable to the existence or location of any Underground Facility that was not shown or indicated or not shown or indicated with reasonable accuracy in the Contract Documents and that Contractor did not know of and could not reasonably have been expected to be aware of or to have anticipated. If Owner and Contractor are unable to agree on entitlement to or on the amount or extent, if any, of any such adjustment in Contract Price or Contract Times, Owner or Contractor may make a Claim therefor as provided in Paragraph 10.05.

4.05 Reference Points

- A. Owner shall provide engineering surveys to establish reference points for construction which in Engineer's judgment are necessary to enable Contractor to proceed with the Work. Contractor shall be responsible for laying out the Work, shall protect and preserve the established reference points and property monuments, and shall make no changes or relocations without the prior written approval of Owner. Contractor shall report to Engineer whenever any reference point or property monument is lost or destroyed or requires relocation because of necessary changes in grades or locations, and shall be responsible for the accurate replacement or relocation of such reference points or property monuments by professionally qualified personnel.

4.06 *Hazardous Environmental Condition at Site*

- A. *Reports and Drawings:* The Supplementary Conditions identify those reports and drawings known to Owner relating to Hazardous Environmental Conditions that have been identified at the Site.
- B. *Limited Reliance by Contractor on Technical Data Authorized:* Contractor may rely upon the accuracy of the “technical data” contained in such reports and drawings, but such reports and drawings are not Contract Documents. Such “technical data” is identified in the Supplementary Conditions. Except for such reliance on such “technical data,” Contractor may not rely upon or make any claim against Owner or Engineer, or any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors with respect to:
1. the completeness of such reports and drawings for Contractor’s purposes, including, but not limited to, any aspects of the means, methods, techniques, sequences and procedures of construction to be employed by Contractor and safety precautions and programs incident thereto; or
 2. other data, interpretations, opinions and information contained in such reports or shown or indicated in such drawings; or
 3. any Contractor interpretation of or conclusion drawn from any “technical data” or any such other data, interpretations, opinions or information.
- C. Contractor shall not be responsible for any Hazardous Environmental Condition uncovered or revealed at the Site which was not shown or indicated in Drawings or Specifications or identified in the Contract Documents to be within the scope of the Work. Contractor shall be responsible for a Hazardous Environmental Condition created with any materials brought to the Site by Contractor, Subcontractors, Suppliers, or anyone else for whom Contractor is responsible.
- D. If Contractor encounters a Hazardous Environmental Condition or if Contractor or anyone for whom Contractor is responsible creates a Hazardous Environmental Condition, Contractor shall immediately: (i) secure or otherwise isolate such condition; (ii) stop all Work in connection with such condition and in any area affected thereby (except in an emergency as required by Paragraph 6.16.A); and (iii) notify Owner and Engineer (and promptly thereafter confirm such notice in writing). Owner shall promptly consult with Engineer concerning the necessity for Owner to retain a qualified expert to evaluate such condition or take corrective action, if any. Promptly after consulting with Engineer, Owner shall take such actions as are necessary to permit Owner to timely obtain required permits and provide Contractor the written notice required by Paragraph 4.06.E.
- E. Contractor shall not be required to resume Work in connection with such condition or in any affected area until after Owner has obtained any required permits related thereto and delivered written notice to Contractor: (i) specifying that such condition and any affected area is or has been rendered safe for the resumption of Work; or (ii) specifying any special conditions under which such Work may be resumed safely. If Owner and Contractor cannot agree as to entitlement to or on the amount or extent, if any, of any adjustment in Contract Price or Contract Times, or both, as a result of such Work stoppage or such special conditions under which Work

is agreed to be resumed by Contractor, either party may make a Claim therefor as provided in Paragraph 10.05.

- F. If after receipt of such written notice Contractor does not agree to resume such Work based on a reasonable belief it is unsafe, or does not agree to resume such Work under such special conditions, then Owner may order the portion of the Work that is in the area affected by such condition to be deleted from the Work. If Owner and Contractor cannot agree as to entitlement to or on the amount or extent, if any, of an adjustment in Contract Price or Contract Times as a result of deleting such portion of the Work, then either party may make a Claim therefor as provided in Paragraph 10.05. Owner may have such deleted portion of the Work performed by Owner's own forces or others in accordance with Article 7.
- G. To the fullest extent permitted by Laws and Regulations, Owner shall indemnify and hold harmless Contractor, Subcontractors, and Engineer, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to a Hazardous Environmental Condition, provided that such Hazardous Environmental Condition: (i) was not shown or indicated in the Drawings or Specifications or identified in the Contract Documents to be included within the scope of the Work, and (ii) was not created by Contractor or by anyone for whom Contractor is responsible. Nothing in this Paragraph 4.06.G shall obligate Owner to indemnify any individual or entity from and against the consequences of that individual's or entity's own negligence.
- H. To the fullest extent permitted by Laws and Regulations, Contractor shall indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to a Hazardous Environmental Condition created by Contractor or by anyone for whom Contractor is responsible. Nothing in this Paragraph 4.06.H shall obligate Contractor to indemnify any individual or entity from and against the consequences of that individual's or entity's own negligence.
- I. The provisions of Paragraphs 4.02, 4.03, and 4.04 do not apply to a Hazardous Environmental Condition uncovered or revealed at the Site.

ARTICLE 5 – BONDS AND INSURANCE

5.01 *Performance, Payment, and Other Bonds*

- A. Contractor shall furnish performance and payment bonds, each in an amount at least equal to the Contract Price as security for the faithful performance and payment of all of Contractor's obligations under the Contract Documents. These bonds shall remain in effect until one year after the date when final payment becomes due or until completion of the correction period specified in Paragraph 13.07, whichever is later, except as provided otherwise by Laws or Regulations or by the Contract Documents. Contractor shall also furnish such other bonds as are required by the Contract Documents.

- B. All bonds shall be in the form prescribed by the Contract Documents except as provided otherwise by Laws or Regulations, and shall be executed by such sureties as are named in the list of “Companies Holding Certificates of Authority as Acceptable Sureties on Federal Bonds and as Acceptable Reinsuring Companies” as published in Circular 570 (amended) by the Financial Management Service, Surety Bond Branch, U.S. Department of the Treasury. All bonds signed by an agent or attorney-in-fact must be accompanied by a certified copy of that individual’s authority to bind the surety. The evidence of authority shall show that it is effective on the date the agent or attorney-in-fact signed each bond.
- C. If the surety on any bond furnished by Contractor is declared bankrupt or becomes insolvent or its right to do business is terminated in any state where any part of the Project is located or it ceases to meet the requirements of Paragraph 5.01.B, Contractor shall promptly notify Owner and Engineer and shall, within 20 days after the event giving rise to such notification, provide another bond and surety, both of which shall comply with the requirements of Paragraphs 5.01.B and 5.02.

5.02 *Licensed Sureties and Insurers*

- A. All bonds and insurance required by the Contract Documents to be purchased and maintained by Owner or Contractor shall be obtained from surety or insurance companies that are duly licensed or authorized in the jurisdiction in which the Project is located to issue bonds or insurance policies for the limits and coverages so required. Such surety and insurance companies shall also meet such additional requirements and qualifications as may be provided in the Supplementary Conditions.

5.03 *Certificates of Insurance*

- A. Contractor shall deliver to Owner, with copies to each additional insured and loss payee identified in the Supplementary Conditions, certificates of insurance (and other evidence of insurance requested by Owner or any other additional insured) which Contractor is required to purchase and maintain.
- B. Owner shall deliver to Contractor, with copies to each additional insured and loss payee identified in the Supplementary Conditions, certificates of insurance (and other evidence of insurance requested by Contractor or any other additional insured) which Owner is required to purchase and maintain.
- C. Failure of Owner to demand such certificates or other evidence of Contractor's full compliance with these insurance requirements or failure of Owner to identify a deficiency in compliance from the evidence provided shall not be construed as a waiver of Contractor’s obligation to maintain such insurance.
- D. Owner does not represent that insurance coverage and limits established in this Contract necessarily will be adequate to protect Contractor.
- E. The insurance and insurance limits required herein shall not be deemed as a limitation on Contractor’s liability under the indemnities granted to Owner in the Contract Documents.

5.04 *Contractor's Insurance*

- A. Contractor shall purchase and maintain such insurance as is appropriate for the Work being performed and as will provide protection from claims set forth below which may arise out of or result from Contractor's performance of the Work and Contractor's other obligations under the Contract Documents, whether it is to be performed by Contractor, any Subcontractor or Supplier, or by anyone directly or indirectly employed by any of them to perform any of the Work, or by anyone for whose acts any of them may be liable:
1. claims under workers' compensation, disability benefits, and other similar employee benefit acts;
 2. claims for damages because of bodily injury, occupational sickness or disease, or death of Contractor's employees;
 3. claims for damages because of bodily injury, sickness or disease, or death of any person other than Contractor's employees;
 4. claims for damages insured by reasonably available personal injury liability coverage which are sustained:
 - a. by any person as a result of an offense directly or indirectly related to the employment of such person by Contractor, or
 - b. by any other person for any other reason;
 5. claims for damages, other than to the Work itself, because of injury to or destruction of tangible property wherever located, including loss of use resulting therefrom; and
 6. claims for damages because of bodily injury or death of any person or property damage arising out of the ownership, maintenance or use of any motor vehicle.
- B. The policies of insurance required by this Paragraph 5.04 shall:
1. with respect to insurance required by Paragraphs 5.04.A.3 through 5.04.A.6 inclusive, be written on an occurrence basis, include as additional insureds (subject to any customary exclusion regarding professional liability) Owner and Engineer, and any other individuals or entities identified in the Supplementary Conditions, all of whom shall be listed as additional insureds, and include coverage for the respective officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of all such additional insureds, and the insurance afforded to these additional insureds shall provide primary coverage for all claims covered thereby;
 2. include at least the specific coverages and be written for not less than the limits of liability provided in the Supplementary Conditions or required by Laws or Regulations, whichever is greater;
 3. include contractual liability insurance covering Contractor's indemnity obligations under Paragraphs 6.11 and 6.20;

4. contain a provision or endorsement that the coverage afforded will not be canceled, materially changed or renewal refused until at least 30 days prior written notice has been given;
5. remain in effect at least until final payment and at all times thereafter when Contractor may be correcting, removing, or replacing defective Work in accordance with Paragraph 13.07; and
6. include completed operations coverage:
 - a. Such insurance shall remain in effect for two years after final payment.
 - b. Contractor shall furnish Owner and each other additional insured identified in the Supplementary Conditions, to whom a certificate of insurance has been issued, evidence satisfactory to Owner and any such additional insured of continuation of such insurance at final payment and one year thereafter.

5.05 *Owner's Liability Insurance*

- A. In addition to the insurance required to be provided by Contractor under Paragraph 5.04, Owner, at Owner's option, may purchase and maintain at Owner's expense Owner's own liability insurance as will protect Owner against claims which may arise from operations under the Contract Documents.

5.06 *Property Insurance*

- A. Unless otherwise provided in the Supplementary Conditions, Owner shall purchase and maintain property insurance upon the Work at the Site in the amount of the full replacement cost thereof (subject to such deductible amounts as may be provided in the Supplementary Conditions or required by Laws and Regulations). This insurance shall:
 1. include the interests of Owner, Contractor, Subcontractors, and Engineer, and any other individuals or entities identified in the Supplementary Conditions, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them, each of whom is deemed to have an insurable interest and shall be listed as a loss payee;
 2. be written on a Builder's Risk "all-risk" policy form that shall at least include insurance for physical loss or damage to the Work, temporary buildings, falsework, and materials and equipment in transit, and shall insure against at least the following perils or causes of loss: fire, lightning, extended coverage, theft, vandalism and malicious mischief, earthquake, collapse, debris removal, demolition occasioned by enforcement of Laws and Regulations, water damage (other than that caused by flood), and such other perils or causes of loss as may be specifically required by the Supplementary Conditions.
 3. include expenses incurred in the repair or replacement of any insured property (including but not limited to fees and charges of engineers and architects);

4. cover materials and equipment stored at the Site or at another location that was agreed to in writing by Owner prior to being incorporated in the Work, provided that such materials and equipment have been included in an Application for Payment recommended by Engineer;
 5. allow for partial utilization of the Work by Owner;
 6. include testing and startup; and
 7. be maintained in effect until final payment is made unless otherwise agreed to in writing by Owner, Contractor, and Engineer with 30 days written notice to each other loss payee to whom a certificate of insurance has been issued.
- B. Owner shall purchase and maintain such equipment breakdown insurance or additional property insurance as may be required by the Supplementary Conditions or Laws and Regulations which will include the interests of Owner, Contractor, Subcontractors, and Engineer, and any other individuals or entities identified in the Supplementary Conditions, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them, each of whom is deemed to have an insurable interest and shall be listed as a loss payee.
- C. All the policies of insurance (and the certificates or other evidence thereof) required to be purchased and maintained in accordance with this Paragraph 5.06 will contain a provision or endorsement that the coverage afforded will not be canceled or materially changed or renewal refused until at least 30 days prior written notice has been given to Owner and Contractor and to each other loss payee to whom a certificate of insurance has been issued and will contain waiver provisions in accordance with Paragraph 5.07.
- D. Owner shall not be responsible for purchasing and maintaining any property insurance specified in this Paragraph 5.06 to protect the interests of Contractor, Subcontractors, or others in the Work to the extent of any deductible amounts that are identified in the Supplementary Conditions. The risk of loss within such identified deductible amount will be borne by Contractor, Subcontractors, or others suffering any such loss, and if any of them wishes property insurance coverage within the limits of such amounts, each may purchase and maintain it at the purchaser's own expense.
- E. If Contractor requests in writing that other special insurance be included in the property insurance policies provided under this Paragraph 5.06, Owner shall, if possible, include such insurance, and the cost thereof will be charged to Contractor by appropriate Change Order. Prior to commencement of the Work at the Site, Owner shall in writing advise Contractor whether or not such other insurance has been procured by Owner.

5.07 *Waiver of Rights*

- A. Owner and Contractor intend that all policies purchased in accordance with Paragraph 5.06 will protect Owner, Contractor, Subcontractors, and Engineer, and all other individuals or entities identified in the Supplementary Conditions as loss payees (and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them) in such policies and will provide primary coverage for all losses and damages caused by the perils or causes of loss covered thereby. All such policies shall contain provisions to the effect that in the event of payment of any loss or damage the insurers will have no rights of recovery against any

of the insureds or loss payees thereunder. Owner and Contractor waive all rights against each other and their respective officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them for all losses and damages caused by, arising out of or resulting from any of the perils or causes of loss covered by such policies and any other property insurance applicable to the Work; and, in addition, waive all such rights against Subcontractors and Engineer, and all other individuals or entities identified in the Supplementary Conditions as loss payees (and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them) under such policies for losses and damages so caused. None of the above waivers shall extend to the rights that any party making such waiver may have to the proceeds of insurance held by Owner as trustee or otherwise payable under any policy so issued.

- B. Owner waives all rights against Contractor, Subcontractors, and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them for:
 - 1. loss due to business interruption, loss of use, or other consequential loss extending beyond direct physical loss or damage to Owner's property or the Work caused by, arising out of, or resulting from fire or other perils whether or not insured by Owner; and
 - 2. loss or damage to the completed Project or part thereof caused by, arising out of, or resulting from fire or other insured peril or cause of loss covered by any property insurance maintained on the completed Project or part thereof by Owner during partial utilization pursuant to Paragraph 14.05, after Substantial Completion pursuant to Paragraph 14.04, or after final payment pursuant to Paragraph 14.07.
- C. Any insurance policy maintained by Owner covering any loss, damage or consequential loss referred to in Paragraph 5.07.B shall contain provisions to the effect that in the event of payment of any such loss, damage, or consequential loss, the insurers will have no rights of recovery against Contractor, Subcontractors, or Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them.

5.08 *Receipt and Application of Insurance Proceeds*

- A. Any insured loss under the policies of insurance required by Paragraph 5.06 will be adjusted with Owner and made payable to Owner as fiduciary for the loss payees, as their interests may appear, subject to the requirements of any applicable mortgage clause and of Paragraph 5.08.B. Owner shall deposit in a separate account any money so received and shall distribute it in accordance with such agreement as the parties in interest may reach. If no other special agreement is reached, the damaged Work shall be repaired or replaced, the moneys so received applied on account thereof, and the Work and the cost thereof covered by an appropriate Change Order.
- B. Owner as fiduciary shall have power to adjust and settle any loss with the insurers unless one of the parties in interest shall object in writing within 15 days after the occurrence of loss to Owner's exercise of this power. If such objection be made, Owner as fiduciary shall make settlement with the insurers in accordance with such agreement as the parties in interest may reach. If no such agreement among the parties in interest is reached, Owner as fiduciary shall

adjust and settle the loss with the insurers and, if required in writing by any party in interest, Owner as fiduciary shall give bond for the proper performance of such duties.

5.09 *Acceptance of Bonds and Insurance; Option to Replace*

- A. If either Owner or Contractor has any objection to the coverage afforded by or other provisions of the bonds or insurance required to be purchased and maintained by the other party in accordance with Article 5 on the basis of non-conformance with the Contract Documents, the objecting party shall so notify the other party in writing within 10 days after receipt of the certificates (or other evidence requested) required by Paragraph 2.01.B. Owner and Contractor shall each provide to the other such additional information in respect of insurance provided as the other may reasonably request. If either party does not purchase or maintain all of the bonds and insurance required of such party by the Contract Documents, such party shall notify the other party in writing of such failure to purchase prior to the start of the Work, or of such failure to maintain prior to any change in the required coverage. Without prejudice to any other right or remedy, the other party may elect to obtain equivalent bonds or insurance to protect such other party's interests at the expense of the party who was required to provide such coverage, and a Change Order shall be issued to adjust the Contract Price accordingly.

5.10 *Partial Utilization, Acknowledgment of Property Insurer*

- A. If Owner finds it necessary to occupy or use a portion or portions of the Work prior to Substantial Completion of all the Work as provided in Paragraph 14.05, no such use or occupancy shall commence before the insurers providing the property insurance pursuant to Paragraph 5.06 have acknowledged notice thereof and in writing effected any changes in coverage necessitated thereby. The insurers providing the property insurance shall consent by endorsement on the policy or policies, but the property insurance shall not be canceled or permitted to lapse on account of any such partial use or occupancy.

ARTICLE 6 – CONTRACTOR'S RESPONSIBILITIES

6.01 *Supervision and Superintendence*

- A. Contractor shall supervise, inspect, and direct the Work competently and efficiently, devoting such attention thereto and applying such skills and expertise as may be necessary to perform the Work in accordance with the Contract Documents. Contractor shall be solely responsible for the means, methods, techniques, sequences, and procedures of construction. Contractor shall not be responsible for the negligence of Owner or Engineer in the design or specification of a specific means, method, technique, sequence, or procedure of construction which is shown or indicated in and expressly required by the Contract Documents.
- B. At all times during the progress of the Work, Contractor shall assign a competent resident superintendent who shall not be replaced without written notice to Owner and Engineer except under extraordinary circumstances.

6.02 *Labor; Working Hours*

- A. Contractor shall provide competent, suitably qualified personnel to survey and lay out the Work and perform construction as required by the Contract Documents. Contractor shall at all times maintain good discipline and order at the Site.
- B. Except as otherwise required for the safety or protection of persons or the Work or property at the Site or adjacent thereto, and except as otherwise stated in the Contract Documents, all Work at the Site shall be performed during regular working hours. Contractor will not permit the performance of Work on a Saturday, Sunday, or any legal holiday without Owner's written consent (which will not be unreasonably withheld) given after prior written notice to Engineer.

6.03 *Services, Materials, and Equipment*

- A. Unless otherwise specified in the Contract Documents, Contractor shall provide and assume full responsibility for all services, materials, equipment, labor, transportation, construction equipment and machinery, tools, appliances, fuel, power, light, heat, telephone, water, sanitary facilities, temporary facilities, and all other facilities and incidentals necessary for the performance, testing, start-up, and completion of the Work.
- B. All materials and equipment incorporated into the Work shall be as specified or, if not specified, shall be of good quality and new, except as otherwise provided in the Contract Documents. All special warranties and guarantees required by the Specifications shall expressly run to the benefit of Owner. If required by Engineer, Contractor shall furnish satisfactory evidence (including reports of required tests) as to the source, kind, and quality of materials and equipment.
- C. All materials and equipment shall be stored, applied, installed, connected, erected, protected, used, cleaned, and conditioned in accordance with instructions of the applicable Supplier, except as otherwise may be provided in the Contract Documents.

6.04 *Progress Schedule*

- A. Contractor shall adhere to the Progress Schedule established in accordance with Paragraph 2.07 as it may be adjusted from time to time as provided below.
 - 1. Contractor shall submit to Engineer for acceptance (to the extent indicated in Paragraph 2.07) proposed adjustments in the Progress Schedule that will not result in changing the Contract Times. Such adjustments will comply with any provisions of the General Requirements applicable thereto.
 - 2. Proposed adjustments in the Progress Schedule that will change the Contract Times shall be submitted in accordance with the requirements of Article 12. Adjustments in Contract Times may only be made by a Change Order.

6.05 *Substitutes and "Or-Equals"*

- A. Whenever an item of material or equipment is specified or described in the Contract Documents by using the name of a proprietary item or the name of a particular Supplier, the specification or description is intended to establish the type, function, appearance, and quality required. Unless the specification or description contains or is followed by words reading that no like, equivalent,

or “or-equal” item or no substitution is permitted, other items of material or equipment or material or equipment of other Suppliers may be submitted to Engineer for review under the circumstances described below.

1. *“Or-Equal” Items:* If in Engineer’s sole discretion an item of material or equipment proposed by Contractor is functionally equal to that named and sufficiently similar so that no change in related Work will be required, it may be considered by Engineer as an “or-equal” item, in which case review and approval of the proposed item may, in Engineer’s sole discretion, be accomplished without compliance with some or all of the requirements for approval of proposed substitute items. For the purposes of this Paragraph 6.05.A.1, a proposed item of material or equipment will be considered functionally equal to an item so named if:

a. in the exercise of reasonable judgment Engineer determines that:

- 1) it is at least equal in materials of construction, quality, durability, appearance, strength, and design characteristics;
- 2) it will reliably perform at least equally well the function and achieve the results imposed by the design concept of the completed Project as a functioning whole; and
- 3) it has a proven record of performance and availability of responsive service.

b. Contractor certifies that, if approved and incorporated into the Work:

- 1) there will be no increase in cost to the Owner or increase in Contract Times; and
- 2) it will conform substantially to the detailed requirements of the item named in the Contract Documents.

2. *Substitute Items:*

a. If in Engineer’s sole discretion an item of material or equipment proposed by Contractor does not qualify as an “or-equal” item under Paragraph 6.05.A.1, it will be considered a proposed substitute item.

b. Contractor shall submit sufficient information as provided below to allow Engineer to determine if the item of material or equipment proposed is essentially equivalent to that named and an acceptable substitute therefor. Requests for review of proposed substitute items of material or equipment will not be accepted by Engineer from anyone other than Contractor.

c. The requirements for review by Engineer will be as set forth in Paragraph 6.05.A.2.d, as supplemented by the General Requirements, and as Engineer may decide is appropriate under the circumstances.

d. Contractor shall make written application to Engineer for review of a proposed substitute item of material or equipment that Contractor seeks to furnish or use. The application:

- 1) shall certify that the proposed substitute item will:

- a) perform adequately the functions and achieve the results called for by the general design,
 - b) be similar in substance to that specified, and
 - c) be suited to the same use as that specified;
- 2) will state:
- a) the extent, if any, to which the use of the proposed substitute item will prejudice Contractor's achievement of Substantial Completion on time,
 - b) whether use of the proposed substitute item in the Work will require a change in any of the Contract Documents (or in the provisions of any other direct contract with Owner for other work on the Project) to adapt the design to the proposed substitute item, and
 - c) whether incorporation or use of the proposed substitute item in connection with the Work is subject to payment of any license fee or royalty;
- 3) will identify:
- a) all variations of the proposed substitute item from that specified, and
 - b) available engineering, sales, maintenance, repair, and replacement services; and
- 4) shall contain an itemized estimate of all costs or credits that will result directly or indirectly from use of such substitute item, including costs of redesign and claims of other contractors affected by any resulting change.

- B. *Substitute Construction Methods or Procedures:* If a specific means, method, technique, sequence, or procedure of construction is expressly required by the Contract Documents, Contractor may furnish or utilize a substitute means, method, technique, sequence, or procedure of construction approved by Engineer. Contractor shall submit sufficient information to allow Engineer, in Engineer's sole discretion, to determine that the substitute proposed is equivalent to that expressly called for by the Contract Documents. The requirements for review by Engineer will be similar to those provided in Paragraph 6.05.A.2.
- C. *Engineer's Evaluation:* Engineer will be allowed a reasonable time within which to evaluate each proposal or submittal made pursuant to Paragraphs 6.05.A and 6.05.B. Engineer may require Contractor to furnish additional data about the proposed substitute item. Engineer will be the sole judge of acceptability. No "or equal" or substitute will be ordered, installed or utilized until Engineer's review is complete, which will be evidenced by a Change Order in the case of a substitute and an approved Shop Drawing for an "or equal." Engineer will advise Contractor in writing of any negative determination.
- D. *Special Guarantee:* Owner may require Contractor to furnish at Contractor's expense a special performance guarantee or other surety with respect to any substitute.

- E. *Engineer's Cost Reimbursement:* Engineer will record Engineer's costs in evaluating a substitute proposed or submitted by Contractor pursuant to Paragraphs 6.05.A.2 and 6.05.B. Whether or not Engineer approves a substitute so proposed or submitted by Contractor, Contractor shall reimburse Owner for the reasonable charges of Engineer for evaluating each such proposed substitute. Contractor shall also reimburse Owner for the reasonable charges of Engineer for making changes in the Contract Documents (or in the provisions of any other direct contract with Owner) resulting from the acceptance of each proposed substitute.
- F. *Contractor's Expense:* Contractor shall provide all data in support of any proposed substitute or "or-equal" at Contractor's expense.

6.06 *Concerning Subcontractors, Suppliers, and Others*

- A. Contractor shall not employ any Subcontractor, Supplier, or other individual or entity (including those acceptable to Owner as indicated in Paragraph 6.06.B), whether initially or as a replacement, against whom Owner may have reasonable objection. Contractor shall not be required to employ any Subcontractor, Supplier, or other individual or entity to furnish or perform any of the Work against whom Contractor has reasonable objection.
- B. If the Supplementary Conditions require the identity of certain Subcontractors, Suppliers, or other individuals or entities to be submitted to Owner in advance for acceptance by Owner by a specified date prior to the Effective Date of the Agreement, and if Contractor has submitted a list thereof in accordance with the Supplementary Conditions, Owner's acceptance (either in writing or by failing to make written objection thereto by the date indicated for acceptance or objection in the Bidding Documents or the Contract Documents) of any such Subcontractor, Supplier, or other individual or entity so identified may be revoked on the basis of reasonable objection after due investigation. Contractor shall submit an acceptable replacement for the rejected Subcontractor, Supplier, or other individual or entity, and the Contract Price will be adjusted by the difference in the cost occasioned by such replacement, and an appropriate Change Order will be issued. No acceptance by Owner of any such Subcontractor, Supplier, or other individual or entity, whether initially or as a replacement, shall constitute a waiver of any right of Owner or Engineer to reject defective Work.
- C. Contractor shall be fully responsible to Owner and Engineer for all acts and omissions of the Subcontractors, Suppliers, and other individuals or entities performing or furnishing any of the Work just as Contractor is responsible for Contractor's own acts and omissions. Nothing in the Contract Documents:
 - 1. shall create for the benefit of any such Subcontractor, Supplier, or other individual or entity any contractual relationship between Owner or Engineer and any such Subcontractor, Supplier or other individual or entity; nor
 - 2. shall create any obligation on the part of Owner or Engineer to pay or to see to the payment of any moneys due any such Subcontractor, Supplier, or other individual or entity except as may otherwise be required by Laws and Regulations.
- D. Contractor shall be solely responsible for scheduling and coordinating the Work of Subcontractors, Suppliers, and other individuals or entities performing or furnishing any of the Work under a direct or indirect contract with Contractor.

- E. Contractor shall require all Subcontractors, Suppliers, and such other individuals or entities performing or furnishing any of the Work to communicate with Engineer through Contractor.
- F. The divisions and sections of the Specifications and the identifications of any Drawings shall not control Contractor in dividing the Work among Subcontractors or Suppliers or delineating the Work to be performed by any specific trade.
- G. All Work performed for Contractor by a Subcontractor or Supplier will be pursuant to an appropriate agreement between Contractor and the Subcontractor or Supplier which specifically binds the Subcontractor or Supplier to the applicable terms and conditions of the Contract Documents for the benefit of Owner and Engineer. Whenever any such agreement is with a Subcontractor or Supplier who is listed as a loss payee on the property insurance provided in Paragraph 5.06, the agreement between the Contractor and the Subcontractor or Supplier will contain provisions whereby the Subcontractor or Supplier waives all rights against Owner, Contractor, Engineer, and all other individuals or entities identified in the Supplementary Conditions to be listed as insureds or loss payees (and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them) for all losses and damages caused by, arising out of, relating to, or resulting from any of the perils or causes of loss covered by such policies and any other property insurance applicable to the Work. If the insurers on any such policies require separate waiver forms to be signed by any Subcontractor or Supplier, Contractor will obtain the same.

6.07 *Patent Fees and Royalties*

- A. Contractor shall pay all license fees and royalties and assume all costs incident to the use in the performance of the Work or the incorporation in the Work of any invention, design, process, product, or device which is the subject of patent rights or copyrights held by others. If a particular invention, design, process, product, or device is specified in the Contract Documents for use in the performance of the Work and if, to the actual knowledge of Owner or Engineer, its use is subject to patent rights or copyrights calling for the payment of any license fee or royalty to others, the existence of such rights shall be disclosed by Owner in the Contract Documents.
- B. To the fullest extent permitted by Laws and Regulations, Owner shall indemnify and hold harmless Contractor, and its officers, directors, members, partners, employees, agents, consultants, and subcontractors from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals, and all court or arbitration or other dispute resolution costs) arising out of or relating to any infringement of patent rights or copyrights incident to the use in the performance of the Work or resulting from the incorporation in the Work of any invention, design, process, product, or device specified in the Contract Documents, but not identified as being subject to payment of any license fee or royalty to others required by patent rights or copyrights.
- C. To the fullest extent permitted by Laws and Regulations, Contractor shall indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to any infringement of patent rights or copyrights incident to the use in the

performance of the Work or resulting from the incorporation in the Work of any invention, design, process, product, or device not specified in the Contract Documents.

6.08 *Permits*

- A. Unless otherwise provided in the Supplementary Conditions, Contractor shall obtain and pay for all construction permits and licenses. Owner shall assist Contractor, when necessary, in obtaining such permits and licenses. Contractor shall pay all governmental charges and inspection fees necessary for the prosecution of the Work which are applicable at the time of opening of Bids, or, if there are no Bids, on the Effective Date of the Agreement. Owner shall pay all charges of utility owners for connections for providing permanent service to the Work.

6.09 *Laws and Regulations*

- A. Contractor shall give all notices required by and shall comply with all Laws and Regulations applicable to the performance of the Work. Except where otherwise expressly required by applicable Laws and Regulations, neither Owner nor Engineer shall be responsible for monitoring Contractor's compliance with any Laws or Regulations.
- B. If Contractor performs any Work knowing or having reason to know that it is contrary to Laws or Regulations, Contractor shall bear all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such Work. However, it shall not be Contractor's responsibility to make certain that the Specifications and Drawings are in accordance with Laws and Regulations, but this shall not relieve Contractor of Contractor's obligations under Paragraph 3.03.
- C. Changes in Laws or Regulations not known at the time of opening of Bids (or, on the Effective Date of the Agreement if there were no Bids) having an effect on the cost or time of performance of the Work shall be the subject of an adjustment in Contract Price or Contract Times. If Owner and Contractor are unable to agree on entitlement to or on the amount or extent, if any, of any such adjustment, a Claim may be made therefor as provided in Paragraph 10.05.

6.10 *Taxes*

- A. Contractor shall pay all sales, consumer, use, and other similar taxes required to be paid by Contractor in accordance with the Laws and Regulations of the place of the Project which are applicable during the performance of the Work.

6.11 *Use of Site and Other Areas*

A. Limitation on Use of Site and Other Areas:

- 1. Contractor shall confine construction equipment, the storage of materials and equipment, and the operations of workers to the Site and other areas permitted by Laws and Regulations, and shall not unreasonably encumber the Site and other areas with construction equipment or other materials or equipment. Contractor shall assume full responsibility for any damage to any such land or area, or to the owner or occupant thereof, or of any adjacent land or areas resulting from the performance of the Work.

2. Should any claim be made by any such owner or occupant because of the performance of the Work, Contractor shall promptly settle with such other party by negotiation or otherwise resolve the claim by arbitration or other dispute resolution proceeding or at law.
 3. To the fullest extent permitted by Laws and Regulations, Contractor shall indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to any claim or action, legal or equitable, brought by any such owner or occupant against Owner, Engineer, or any other party indemnified hereunder to the extent caused by or based upon Contractor's performance of the Work.
- B. *Removal of Debris During Performance of the Work:* During the progress of the Work Contractor shall keep the Site and other areas free from accumulations of waste materials, rubbish, and other debris. Removal and disposal of such waste materials, rubbish, and other debris shall conform to applicable Laws and Regulations.
- C. *Cleaning:* Prior to Substantial Completion of the Work Contractor shall clean the Site and the Work and make it ready for utilization by Owner. At the completion of the Work Contractor shall remove from the Site all tools, appliances, construction equipment and machinery, and surplus materials and shall restore to original condition all property not designated for alteration by the Contract Documents.
- D. *Loading Structures:* Contractor shall not load nor permit any part of any structure to be loaded in any manner that will endanger the structure, nor shall Contractor subject any part of the Work or adjacent property to stresses or pressures that will endanger it.

6.12 *Record Documents*

- A. Contractor shall maintain in a safe place at the Site one record copy of all Drawings, Specifications, Addenda, Change Orders, Work Change Directives, Field Orders, and written interpretations and clarifications in good order and annotated to show changes made during construction. These record documents together with all approved Samples and a counterpart of all approved Shop Drawings will be available to Engineer for reference. Upon completion of the Work, these record documents, Samples, and Shop Drawings will be delivered to Engineer for Owner.

6.13 *Safety and Protection*

- A. Contractor shall be solely responsible for initiating, maintaining and supervising all safety precautions and programs in connection with the Work. Such responsibility does not relieve Subcontractors of their responsibility for the safety of persons or property in the performance of their work, nor for compliance with applicable safety Laws and Regulations. Contractor shall take all necessary precautions for the safety of, and shall provide the necessary protection to prevent damage, injury or loss to:
1. all persons on the Site or who may be affected by the Work;

2. all the Work and materials and equipment to be incorporated therein, whether in storage on or off the Site; and
 3. other property at the Site or adjacent thereto, including trees, shrubs, lawns, walks, pavements, roadways, structures, utilities, and Underground Facilities not designated for removal, relocation, or replacement in the course of construction.
- B. Contractor shall comply with all applicable Laws and Regulations relating to the safety of persons or property, or to the protection of persons or property from damage, injury, or loss; and shall erect and maintain all necessary safeguards for such safety and protection. Contractor shall notify owners of adjacent property and of Underground Facilities and other utility owners when prosecution of the Work may affect them, and shall cooperate with them in the protection, removal, relocation, and replacement of their property.
 - C. Contractor shall comply with the applicable requirements of Owner's safety programs, if any. The Supplementary Conditions identify any Owner's safety programs that are applicable to the Work.
 - D. Contractor shall inform Owner and Engineer of the specific requirements of Contractor's safety program with which Owner's and Engineer's employees and representatives must comply while at the Site.
 - E. All damage, injury, or loss to any property referred to in Paragraph 6.13.A.2 or 6.13.A.3 caused, directly or indirectly, in whole or in part, by Contractor, any Subcontractor, Supplier, or any other individual or entity directly or indirectly employed by any of them to perform any of the Work, or anyone for whose acts any of them may be liable, shall be remedied by Contractor (except damage or loss attributable to the fault of Drawings or Specifications or to the acts or omissions of Owner or Engineer or anyone employed by any of them, or anyone for whose acts any of them may be liable, and not attributable, directly or indirectly, in whole or in part, to the fault or negligence of Contractor or any Subcontractor, Supplier, or other individual or entity directly or indirectly employed by any of them).
 - F. Contractor's duties and responsibilities for safety and for protection of the Work shall continue until such time as all the Work is completed and Engineer has issued a notice to Owner and Contractor in accordance with Paragraph 14.07.B that the Work is acceptable (except as otherwise expressly provided in connection with Substantial Completion).

6.14 *Safety Representative*

- A. Contractor shall designate a qualified and experienced safety representative at the Site whose duties and responsibilities shall be the prevention of accidents and the maintaining and supervising of safety precautions and programs.

6.15 *Hazard Communication Programs*

- A. Contractor shall be responsible for coordinating any exchange of material safety data sheets or other hazard communication information required to be made available to or exchanged between or among employers at the Site in accordance with Laws or Regulations.

6.16 *Emergencies*

- A. In emergencies affecting the safety or protection of persons or the Work or property at the Site or adjacent thereto, Contractor is obligated to act to prevent threatened damage, injury, or loss. Contractor shall give Engineer prompt written notice if Contractor believes that any significant changes in the Work or variations from the Contract Documents have been caused thereby or are required as a result thereof. If Engineer determines that a change in the Contract Documents is required because of the action taken by Contractor in response to such an emergency, a Work Change Directive or Change Order will be issued.

6.17 *Shop Drawings and Samples*

- A. Contractor shall submit Shop Drawings and Samples to Engineer for review and approval in accordance with the accepted Schedule of Submittals (as required by Paragraph 2.07). Each submittal will be identified as Engineer may require.

1. *Shop Drawings:*

- a. Submit number of copies specified in the General Requirements.
- b. Data shown on the Shop Drawings will be complete with respect to quantities, dimensions, specified performance and design criteria, materials, and similar data to show Engineer the services, materials, and equipment Contractor proposes to provide and to enable Engineer to review the information for the limited purposes required by Paragraph 6.17.D.

2. *Samples:*

- a. Submit number of Samples specified in the Specifications.
- b. Clearly identify each Sample as to material, Supplier, pertinent data such as catalog numbers, the use for which intended and other data as Engineer may require to enable Engineer to review the submittal for the limited purposes required by Paragraph 6.17.D.

- B. Where a Shop Drawing or Sample is required by the Contract Documents or the Schedule of Submittals, any related Work performed prior to Engineer's review and approval of the pertinent submittal will be at the sole expense and responsibility of Contractor.

C. *Submittal Procedures:*

- 1. Before submitting each Shop Drawing or Sample, Contractor shall have:

- a. reviewed and coordinated each Shop Drawing or Sample with other Shop Drawings and Samples and with the requirements of the Work and the Contract Documents;
- b. determined and verified all field measurements, quantities, dimensions, specified performance and design criteria, installation requirements, materials, catalog numbers, and similar information with respect thereto;

- c. determined and verified the suitability of all materials offered with respect to the indicated application, fabrication, shipping, handling, storage, assembly, and installation pertaining to the performance of the Work; and
 - d. determined and verified all information relative to Contractor's responsibilities for means, methods, techniques, sequences, and procedures of construction, and safety precautions and programs incident thereto.
2. Each submittal shall bear a stamp or specific written certification that Contractor has satisfied Contractor's obligations under the Contract Documents with respect to Contractor's review and approval of that submittal.
3. With each submittal, Contractor shall give Engineer specific written notice of any variations that the Shop Drawing or Sample may have from the requirements of the Contract Documents. This notice shall be both a written communication separate from the Shop Drawings or Sample submittal; and, in addition, by a specific notation made on each Shop Drawing or Sample submitted to Engineer for review and approval of each such variation.

D. Engineer's Review:

1. Engineer will provide timely review of Shop Drawings and Samples in accordance with the Schedule of Submittals acceptable to Engineer. Engineer's review and approval will be only to determine if the items covered by the submittals will, after installation or incorporation in the Work, conform to the information given in the Contract Documents and be compatible with the design concept of the completed Project as a functioning whole as indicated by the Contract Documents.
2. Engineer's review and approval will not extend to means, methods, techniques, sequences, or procedures of construction (except where a particular means, method, technique, sequence, or procedure of construction is specifically and expressly called for by the Contract Documents) or to safety precautions or programs incident thereto. The review and approval of a separate item as such will not indicate approval of the assembly in which the item functions.
3. Engineer's review and approval shall not relieve Contractor from responsibility for any variation from the requirements of the Contract Documents unless Contractor has complied with the requirements of Paragraph 6.17.C.3 and Engineer has given written approval of each such variation by specific written notation thereof incorporated in or accompanying the Shop Drawing or Sample. Engineer's review and approval shall not relieve Contractor from responsibility for complying with the requirements of Paragraph 6.17.C.1.

E. Resubmittal Procedures:

1. Contractor shall make corrections required by Engineer and shall return the required number of corrected copies of Shop Drawings and submit, as required, new Samples for review and approval. Contractor shall direct specific attention in writing to revisions other than the corrections called for by Engineer on previous submittals.

6.18 *Continuing the Work*

- A. Contractor shall carry on the Work and adhere to the Progress Schedule during all disputes or disagreements with Owner. No Work shall be delayed or postponed pending resolution of any disputes or disagreements, except as permitted by Paragraph 15.04 or as Owner and Contractor may otherwise agree in writing.

6.19 *Contractor's General Warranty and Guarantee*

- A. Contractor warrants and guarantees to Owner that all Work will be in accordance with the Contract Documents and will not be defective. Engineer and its officers, directors, members, partners, employees, agents, consultants, and subcontractors shall be entitled to rely on representation of Contractor's warranty and guarantee.
- B. Contractor's warranty and guarantee hereunder excludes defects or damage caused by:
 - 1. abuse, modification, or improper maintenance or operation by persons other than Contractor, Subcontractors, Suppliers, or any other individual or entity for whom Contractor is responsible; or
 - 2. normal wear and tear under normal usage.
- C. Contractor's obligation to perform and complete the Work in accordance with the Contract Documents shall be absolute. None of the following will constitute an acceptance of Work that is not in accordance with the Contract Documents or a release of Contractor's obligation to perform the Work in accordance with the Contract Documents:
 - 1. observations by Engineer;
 - 2. recommendation by Engineer or payment by Owner of any progress or final payment;
 - 3. the issuance of a certificate of Substantial Completion by Engineer or any payment related thereto by Owner;
 - 4. use or occupancy of the Work or any part thereof by Owner;
 - 5. any review and approval of a Shop Drawing or Sample submittal or the issuance of a notice of acceptability by Engineer;
 - 6. any inspection, test, or approval by others; or
 - 7. any correction of defective Work by Owner.

6.20 *Indemnification*

- A. To the fullest extent permitted by Laws and Regulations, Contractor shall indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out

of or relating to the performance of the Work, provided that any such claim, cost, loss, or damage is attributable to bodily injury, sickness, disease, or death, or to injury to or destruction of tangible property (other than the Work itself), including the loss of use resulting therefrom but only to the extent caused by any negligent act or omission of Contractor, any Subcontractor, any Supplier, or any individual or entity directly or indirectly employed by any of them to perform any of the Work or anyone for whose acts any of them may be liable .

- B. In any and all claims against Owner or Engineer or any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors by any employee (or the survivor or personal representative of such employee) of Contractor, any Subcontractor, any Supplier, or any individual or entity directly or indirectly employed by any of them to perform any of the Work, or anyone for whose acts any of them may be liable, the indemnification obligation under Paragraph 6.20.A shall not be limited in any way by any limitation on the amount or type of damages, compensation, or benefits payable by or for Contractor or any such Subcontractor, Supplier, or other individual or entity under workers' compensation acts, disability benefit acts, or other employee benefit acts.
- C. The indemnification obligations of Contractor under Paragraph 6.20.A shall not extend to the liability of Engineer and Engineer's officers, directors, members, partners, employees, agents, consultants and subcontractors arising out of:
 - 1. the preparation or approval of, or the failure to prepare or approve maps, Drawings, opinions, reports, surveys, Change Orders, designs, or Specifications; or
 - 2. giving directions or instructions, or failing to give them, if that is the primary cause of the injury or damage.

6.21 *Delegation of Professional Design Services*

- A. Contractor will not be required to provide professional design services unless such services are specifically required by the Contract Documents for a portion of the Work or unless such services are required to carry out Contractor's responsibilities for construction means, methods, techniques, sequences and procedures. Contractor shall not be required to provide professional services in violation of applicable law.
- B. If professional design services or certifications by a design professional related to systems, materials or equipment are specifically required of Contractor by the Contract Documents, Owner and Engineer will specify all performance and design criteria that such services must satisfy. Contractor shall cause such services or certifications to be provided by a properly licensed professional, whose signature and seal shall appear on all drawings, calculations, specifications, certifications, Shop Drawings and other submittals prepared by such professional. Shop Drawings and other submittals related to the Work designed or certified by such professional, if prepared by others, shall bear such professional's written approval when submitted to Engineer.
- C. Owner and Engineer shall be entitled to rely upon the adequacy, accuracy and completeness of the services, certifications or approvals performed by such design professionals, provided Owner and Engineer have specified to Contractor all performance and design criteria that such services must satisfy.

- D. Pursuant to this Paragraph 6.21, Engineer's review and approval of design calculations and design drawings will be only for the limited purpose of checking for conformance with performance and design criteria given and the design concept expressed in the Contract Documents. Engineer's review and approval of Shop Drawings and other submittals (except design calculations and design drawings) will be only for the purpose stated in Paragraph 6.17.D.1.
- E. Contractor shall not be responsible for the adequacy of the performance or design criteria required by the Contract Documents.

ARTICLE 7 – OTHER WORK AT THE SITE

7.01 *Related Work at Site*

- A. Owner may perform other work related to the Project at the Site with Owner's employees, or through other direct contracts therefor, or have other work performed by utility owners. If such other work is not noted in the Contract Documents, then:
 - 1. written notice thereof will be given to Contractor prior to starting any such other work; and
 - 2. if Owner and Contractor are unable to agree on entitlement to or on the amount or extent, if any, of any adjustment in the Contract Price or Contract Times that should be allowed as a result of such other work, a Claim may be made therefor as provided in Paragraph 10.05.
- B. Contractor shall afford each other contractor who is a party to such a direct contract, each utility owner, and Owner, if Owner is performing other work with Owner's employees, proper and safe access to the Site, provide a reasonable opportunity for the introduction and storage of materials and equipment and the execution of such other work, and properly coordinate the Work with theirs. Contractor shall do all cutting, fitting, and patching of the Work that may be required to properly connect or otherwise make its several parts come together and properly integrate with such other work. Contractor shall not endanger any work of others by cutting, excavating, or otherwise altering such work; provided, however, that Contractor may cut or alter others' work with the written consent of Engineer and the others whose work will be affected. The duties and responsibilities of Contractor under this Paragraph are for the benefit of such utility owners and other contractors to the extent that there are comparable provisions for the benefit of Contractor in said direct contracts between Owner and such utility owners and other contractors.
- C. If the proper execution or results of any part of Contractor's Work depends upon work performed by others under this Article 7, Contractor shall inspect such other work and promptly report to Engineer in writing any delays, defects, or deficiencies in such other work that render it unavailable or unsuitable for the proper execution and results of Contractor's Work. Contractor's failure to so report will constitute an acceptance of such other work as fit and proper for integration with Contractor's Work except for latent defects and deficiencies in such other work.

7.02 *Coordination*

- A. If Owner intends to contract with others for the performance of other work on the Project at the Site, the following will be set forth in Supplementary Conditions:

1. the individual or entity who will have authority and responsibility for coordination of the activities among the various contractors will be identified;
 2. the specific matters to be covered by such authority and responsibility will be itemized; and
 3. the extent of such authority and responsibilities will be provided.
- B. Unless otherwise provided in the Supplementary Conditions, Owner shall have sole authority and responsibility for such coordination.

7.03 *Legal Relationships*

- A. Paragraphs 7.01.A and 7.02 are not applicable for utilities not under the control of Owner.
- B. Each other direct contract of Owner under Paragraph 7.01.A shall provide that the other contractor is liable to Owner and Contractor for the reasonable direct delay and disruption costs incurred by Contractor as a result of the other contractor's wrongful actions or inactions.
- C. Contractor shall be liable to Owner and any other contractor under direct contract to Owner for the reasonable direct delay and disruption costs incurred by such other contractor as a result of Contractor's wrongful action or inactions.

ARTICLE 8 – OWNER'S RESPONSIBILITIES

8.01 *Communications to Contractor*

- A. Except as otherwise provided in these General Conditions, Owner shall issue all communications to Contractor through Engineer.

8.02 *Replacement of Engineer*

- A. In case of termination of the employment of Engineer, Owner shall appoint an engineer to whom Contractor makes no reasonable objection, whose status under the Contract Documents shall be that of the former Engineer.

8.03 *Furnish Data*

- A. Owner shall promptly furnish the data required of Owner under the Contract Documents.

8.04 *Pay When Due*

- A. Owner shall make payments to Contractor when they are due as provided in Paragraphs 14.02.C and 14.07.C.

8.05 *Lands and Easements; Reports and Tests*

- A. Owner's duties with respect to providing lands and easements and providing engineering surveys to establish reference points are set forth in Paragraphs 4.01 and 4.05. Paragraph 4.02 refers to Owner's identifying and making available to Contractor copies of reports of explorations and

tests of subsurface conditions and drawings of physical conditions relating to existing surface or subsurface structures at the Site.

8.06 *Insurance*

- A. Owner's responsibilities, if any, with respect to purchasing and maintaining liability and property insurance are set forth in Article 5.

8.07 *Change Orders*

- A. Owner is obligated to execute Change Orders as indicated in Paragraph 10.03.

8.08 *Inspections, Tests, and Approvals*

- A. Owner's responsibility with respect to certain inspections, tests, and approvals is set forth in Paragraph 13.03.B.

8.09 *Limitations on Owner's Responsibilities*

- A. The Owner shall not supervise, direct, or have control or authority over, nor be responsible for, Contractor's means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or for any failure of Contractor to comply with Laws and Regulations applicable to the performance of the Work. Owner will not be responsible for Contractor's failure to perform the Work in accordance with the Contract Documents.

8.10 *Undisclosed Hazardous Environmental Condition*

- A. Owner's responsibility in respect to an undisclosed Hazardous Environmental Condition is set forth in Paragraph 4.06.

8.11 *Evidence of Financial Arrangements*

- A. Upon request of Contractor, Owner shall furnish Contractor reasonable evidence that financial arrangements have been made to satisfy Owner's obligations under the Contract Documents.

8.12 *Compliance with Safety Program*

- A. While at the Site, Owner's employees and representatives shall comply with the specific applicable requirements of Contractor's safety programs of which Owner has been informed pursuant to Paragraph 6.13.D.

ARTICLE 9 – ENGINEER'S STATUS DURING CONSTRUCTION

9.01 *Owner's Representative*

- A. Engineer will be Owner's representative during the construction period. The duties and responsibilities and the limitations of authority of Engineer as Owner's representative during construction are set forth in the Contract Documents.

9.02 *Visits to Site*

- A. Engineer will make visits to the Site at intervals appropriate to the various stages of construction as Engineer deems necessary in order to observe as an experienced and qualified design professional the progress that has been made and the quality of the various aspects of Contractor's executed Work. Based on information obtained during such visits and observations, Engineer, for the benefit of Owner, will determine, in general, if the Work is proceeding in accordance with the Contract Documents. Engineer will not be required to make exhaustive or continuous inspections on the Site to check the quality or quantity of the Work. Engineer's efforts will be directed toward providing for Owner a greater degree of confidence that the completed Work will conform generally to the Contract Documents. On the basis of such visits and observations, Engineer will keep Owner informed of the progress of the Work and will endeavor to guard Owner against defective Work.
- B. Engineer's visits and observations are subject to all the limitations on Engineer's authority and responsibility set forth in Paragraph 9.09. Particularly, but without limitation, during or as a result of Engineer's visits or observations of Contractor's Work, Engineer will not supervise, direct, control, or have authority over or be responsible for Contractor's means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or for any failure of Contractor to comply with Laws and Regulations applicable to the performance of the Work.

9.03 *Project Representative*

- A. If Owner and Engineer agree, Engineer will furnish a Resident Project Representative to assist Engineer in providing more extensive observation of the Work. The authority and responsibilities of any such Resident Project Representative and assistants will be as provided in the Supplementary Conditions, and limitations on the responsibilities thereof will be as provided in Paragraph 9.09. If Owner designates another representative or agent to represent Owner at the Site who is not Engineer's consultant, agent or employee, the responsibilities and authority and limitations thereon of such other individual or entity will be as provided in the Supplementary Conditions.

9.04 *Authorized Variations in Work*

- A. Engineer may authorize minor variations in the Work from the requirements of the Contract Documents which do not involve an adjustment in the Contract Price or the Contract Times and are compatible with the design concept of the completed Project as a functioning whole as indicated by the Contract Documents. These may be accomplished by a Field Order and will be binding on Owner and also on Contractor, who shall perform the Work involved promptly. If Owner or Contractor believes that a Field Order justifies an adjustment in the Contract Price or Contract Times, or both, and the parties are unable to agree on entitlement to or on the amount or extent, if any, of any such adjustment, a Claim may be made therefor as provided in Paragraph 10.05.

9.05 *Rejecting Defective Work*

- A. Engineer will have authority to reject Work which Engineer believes to be defective, or that Engineer believes will not produce a completed Project that conforms to the Contract

Documents or that will prejudice the integrity of the design concept of the completed Project as a functioning whole as indicated by the Contract Documents. Engineer will also have authority to require special inspection or testing of the Work as provided in Paragraph 13.04, whether or not the Work is fabricated, installed, or completed.

9.06 *Shop Drawings, Change Orders and Payments*

- A. In connection with Engineer's authority, and limitations thereof, as to Shop Drawings and Samples, see Paragraph 6.17.
- B. In connection with Engineer's authority, and limitations thereof, as to design calculations and design drawings submitted in response to a delegation of professional design services, if any, see Paragraph 6.21.
- C. In connection with Engineer's authority as to Change Orders, see Articles 10, 11, and 12.
- D. In connection with Engineer's authority as to Applications for Payment, see Article 14.

9.07 *Determinations for Unit Price Work*

- A. Engineer will determine the actual quantities and classifications of Unit Price Work performed by Contractor. Engineer will review with Contractor the Engineer's preliminary determinations on such matters before rendering a written decision thereon (by recommendation of an Application for Payment or otherwise). Engineer's written decision thereon will be final and binding (except as modified by Engineer to reflect changed factual conditions or more accurate data) upon Owner and Contractor, subject to the provisions of Paragraph 10.05.

9.08 *Decisions on Requirements of Contract Documents and Acceptability of Work*

- A. Engineer will be the initial interpreter of the requirements of the Contract Documents and judge of the acceptability of the Work thereunder. All matters in question and other matters between Owner and Contractor arising prior to the date final payment is due relating to the acceptability of the Work, and the interpretation of the requirements of the Contract Documents pertaining to the performance of the Work, will be referred initially to Engineer in writing within 30 days of the event giving rise to the question.
- B. Engineer will, with reasonable promptness, render a written decision on the issue referred. If Owner or Contractor believes that any such decision entitles them to an adjustment in the Contract Price or Contract Times or both, a Claim may be made under Paragraph 10.05. The date of Engineer's decision shall be the date of the event giving rise to the issues referenced for the purposes of Paragraph 10.05.B.
- C. Engineer's written decision on the issue referred will be final and binding on Owner and Contractor, subject to the provisions of Paragraph 10.05.
- D. When functioning as interpreter and judge under this Paragraph 9.08, Engineer will not show partiality to Owner or Contractor and will not be liable in connection with any interpretation or decision rendered in good faith in such capacity.

9.09 *Limitations on Engineer's Authority and Responsibilities*

- A. Neither Engineer's authority or responsibility under this Article 9 or under any other provision of the Contract Documents nor any decision made by Engineer in good faith either to exercise or not exercise such authority or responsibility or the undertaking, exercise, or performance of any authority or responsibility by Engineer shall create, impose, or give rise to any duty in contract, tort, or otherwise owed by Engineer to Contractor, any Subcontractor, any Supplier, any other individual or entity, or to any surety for or employee or agent of any of them.
- B. Engineer will not supervise, direct, control, or have authority over or be responsible for Contractor's means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or for any failure of Contractor to comply with Laws and Regulations applicable to the performance of the Work. Engineer will not be responsible for Contractor's failure to perform the Work in accordance with the Contract Documents.
- C. Engineer will not be responsible for the acts or omissions of Contractor or of any Subcontractor, any Supplier, or of any other individual or entity performing any of the Work.
- D. Engineer's review of the final Application for Payment and accompanying documentation and all maintenance and operating instructions, schedules, guarantees, bonds, certificates of inspection, tests and approvals, and other documentation required to be delivered by Paragraph 14.07.A will only be to determine generally that their content complies with the requirements of, and in the case of certificates of inspections, tests, and approvals that the results certified indicate compliance with, the Contract Documents.
- E. The limitations upon authority and responsibility set forth in this Paragraph 9.09 shall also apply to the Resident Project Representative, if any, and assistants, if any.

9.10 *Compliance with Safety Program*

- A. While at the Site, Engineer's employees and representatives shall comply with the specific applicable requirements of Contractor's safety programs of which Engineer has been informed pursuant to Paragraph 6.13.D.

ARTICLE 10 – CHANGES IN THE WORK; CLAIMS

10.01 *Authorized Changes in the Work*

- A. Without invalidating the Contract and without notice to any surety, Owner may, at any time or from time to time, order additions, deletions, or revisions in the Work by a Change Order, or a Work Change Directive. Upon receipt of any such document, Contractor shall promptly proceed with the Work involved which will be performed under the applicable conditions of the Contract Documents (except as otherwise specifically provided).
- B. If Owner and Contractor are unable to agree on entitlement to, or on the amount or extent, if any, of an adjustment in the Contract Price or Contract Times, or both, that should be allowed as a result of a Work Change Directive, a Claim may be made therefor as provided in Paragraph 10.05.

10.02 *Unauthorized Changes in the Work*

- A. Contractor shall not be entitled to an increase in the Contract Price or an extension of the Contract Times with respect to any work performed that is not required by the Contract Documents as amended, modified, or supplemented as provided in Paragraph 3.04, except in the case of an emergency as provided in Paragraph 6.16 or in the case of uncovering Work as provided in Paragraph 13.04.D.

10.03 *Execution of Change Orders*

- A. Owner and Contractor shall execute appropriate Change Orders recommended by Engineer covering:
 - 1. changes in the Work which are: (i) ordered by Owner pursuant to Paragraph 10.01.A, (ii) required because of acceptance of defective Work under Paragraph 13.08.A or Owner's correction of defective Work under Paragraph 13.09, or (iii) agreed to by the parties;
 - 2. changes in the Contract Price or Contract Times which are agreed to by the parties, including any undisputed sum or amount of time for Work actually performed in accordance with a Work Change Directive; and
 - 3. changes in the Contract Price or Contract Times which embody the substance of any written decision rendered by Engineer pursuant to Paragraph 10.05; provided that, in lieu of executing any such Change Order, an appeal may be taken from any such decision in accordance with the provisions of the Contract Documents and applicable Laws and Regulations, but during any such appeal, Contractor shall carry on the Work and adhere to the Progress Schedule as provided in Paragraph 6.18.A.

10.04 *Notification to Surety*

- A. If the provisions of any bond require notice to be given to a surety of any change affecting the general scope of the Work or the provisions of the Contract Documents (including, but not limited to, Contract Price or Contract Times), the giving of any such notice will be Contractor's responsibility. The amount of each applicable bond will be adjusted to reflect the effect of any such change.

10.05 *Claims*

- A. *Engineer's Decision Required:* All Claims, except those waived pursuant to Paragraph 14.09, shall be referred to the Engineer for decision. A decision by Engineer shall be required as a condition precedent to any exercise by Owner or Contractor of any rights or remedies either may otherwise have under the Contract Documents or by Laws and Regulations in respect of such Claims.
- B. *Notice:* Written notice stating the general nature of each Claim shall be delivered by the claimant to Engineer and the other party to the Contract promptly (but in no event later than 30 days) after the start of the event giving rise thereto. The responsibility to substantiate a Claim shall rest with the party making the Claim. Notice of the amount or extent of the Claim, with supporting data shall be delivered to the Engineer and the other party to the Contract within 60 days after the

start of such event (unless Engineer allows additional time for claimant to submit additional or more accurate data in support of such Claim). A Claim for an adjustment in Contract Price shall be prepared in accordance with the provisions of Paragraph 12.01.B. A Claim for an adjustment in Contract Times shall be prepared in accordance with the provisions of Paragraph 12.02.B. Each Claim shall be accompanied by claimant's written statement that the adjustment claimed is the entire adjustment to which the claimant believes it is entitled as a result of said event. The opposing party shall submit any response to Engineer and the claimant within 30 days after receipt of the claimant's last submittal (unless Engineer allows additional time).

- C. *Engineer's Action:* Engineer will review each Claim and, within 30 days after receipt of the last submittal of the claimant or the last submittal of the opposing party, if any, take one of the following actions in writing:
1. deny the Claim in whole or in part;
 2. approve the Claim; or
 3. notify the parties that the Engineer is unable to resolve the Claim if, in the Engineer's sole discretion, it would be inappropriate for the Engineer to do so. For purposes of further resolution of the Claim, such notice shall be deemed a denial.
- D. In the event that Engineer does not take action on a Claim within said 30 days, the Claim shall be deemed denied.
- E. Engineer's written action under Paragraph 10.05.C or denial pursuant to Paragraphs 10.05.C.3 or 10.05.D will be final and binding upon Owner and Contractor, unless Owner or Contractor invoke the dispute resolution procedure set forth in Article 16 within 30 days of such action or denial.
- F. No Claim for an adjustment in Contract Price or Contract Times will be valid if not submitted in accordance with this Paragraph 10.05.

ARTICLE 11 – COST OF THE WORK; ALLOWANCES; UNIT PRICE WORK

11.01 *Cost of the Work*

- A. *Costs Included:* The term Cost of the Work means the sum of all costs, except those excluded in Paragraph 11.01.B, necessarily incurred and paid by Contractor in the proper performance of the Work. When the value of any Work covered by a Change Order or when a Claim for an adjustment in Contract Price is determined on the basis of Cost of the Work, the costs to be reimbursed to Contractor will be only those additional or incremental costs required because of the change in the Work or because of the event giving rise to the Claim. Except as otherwise may be agreed to in writing by Owner, such costs shall be in amounts no higher than those prevailing in the locality of the Project, shall not include any of the costs itemized in Paragraph 11.01.B, and shall include only the following items:
1. Payroll costs for employees in the direct employ of Contractor in the performance of the Work under schedules of job classifications agreed upon by Owner and Contractor. Such employees shall include, without limitation, superintendents, foremen, and other personnel

employed full time on the Work. Payroll costs for employees not employed full time on the Work shall be apportioned on the basis of their time spent on the Work. Payroll costs shall include, but not be limited to, salaries and wages plus the cost of fringe benefits, which shall include social security contributions, unemployment, excise, and payroll taxes, workers' compensation, health and retirement benefits, bonuses, sick leave, vacation and holiday pay applicable thereto. The expenses of performing Work outside of regular working hours, on Saturday, Sunday, or legal holidays, shall be included in the above to the extent authorized by Owner.

2. Cost of all materials and equipment furnished and incorporated in the Work, including costs of transportation and storage thereof, and Suppliers' field services required in connection therewith. All cash discounts shall accrue to Contractor unless Owner deposits funds with Contractor with which to make payments, in which case the cash discounts shall accrue to Owner. All trade discounts, rebates and refunds and returns from sale of surplus materials and equipment shall accrue to Owner, and Contractor shall make provisions so that they may be obtained.
3. Payments made by Contractor to Subcontractors for Work performed by Subcontractors. If required by Owner, Contractor shall obtain competitive bids from subcontractors acceptable to Owner and Contractor and shall deliver such bids to Owner, who will then determine, with the advice of Engineer, which bids, if any, will be acceptable. If any subcontract provides that the Subcontractor is to be paid on the basis of Cost of the Work plus a fee, the Subcontractor's Cost of the Work and fee shall be determined in the same manner as Contractor's Cost of the Work and fee as provided in this Paragraph 11.01.
4. Costs of special consultants (including but not limited to engineers, architects, testing laboratories, surveyors, attorneys, and accountants) employed for services specifically related to the Work.
5. Supplemental costs including the following:
 - a. The proportion of necessary transportation, travel, and subsistence expenses of Contractor's employees incurred in discharge of duties connected with the Work.
 - b. Cost, including transportation and maintenance, of all materials, supplies, equipment, machinery, appliances, office, and temporary facilities at the Site, and hand tools not owned by the workers, which are consumed in the performance of the Work, and cost, less market value, of such items used but not consumed which remain the property of Contractor.
 - c. Rentals of all construction equipment and machinery, and the parts thereof whether rented from Contractor or others in accordance with rental agreements approved by Owner with the advice of Engineer, and the costs of transportation, loading, unloading, assembly, dismantling, and removal thereof. All such costs shall be in accordance with the terms of said rental agreements. The rental of any such equipment, machinery, or parts shall cease when the use thereof is no longer necessary for the Work.
 - d. Sales, consumer, use, and other similar taxes related to the Work, and for which Contractor is liable, as imposed by Laws and Regulations.

- e. Deposits lost for causes other than negligence of Contractor, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable, and royalty payments and fees for permits and licenses.
- f. Losses and damages (and related expenses) caused by damage to the Work, not compensated by insurance or otherwise, sustained by Contractor in connection with the performance of the Work (except losses and damages within the deductible amounts of property insurance established in accordance with Paragraph 5.06.D), provided such losses and damages have resulted from causes other than the negligence of Contractor, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable. Such losses shall include settlements made with the written consent and approval of Owner. No such losses, damages, and expenses shall be included in the Cost of the Work for the purpose of determining Contractor's fee.
- g. The cost of utilities, fuel, and sanitary facilities at the Site.
- h. Minor expenses such as telegrams, long distance telephone calls, telephone service at the Site, express and courier services, and similar petty cash items in connection with the Work.
- i. The costs of premiums for all bonds and insurance Contractor is required by the Contract Documents to purchase and maintain.

B. *Costs Excluded:* The term Cost of the Work shall not include any of the following items:

- 1. Payroll costs and other compensation of Contractor's officers, executives, principals (of partnerships and sole proprietorships), general managers, safety managers, engineers, architects, estimators, attorneys, auditors, accountants, purchasing and contracting agents, expeditors, timekeepers, clerks, and other personnel employed by Contractor, whether at the Site or in Contractor's principal or branch office for general administration of the Work and not specifically included in the agreed upon schedule of job classifications referred to in Paragraph 11.01.A.1 or specifically covered by Paragraph 11.01.A.4, all of which are to be considered administrative costs covered by the Contractor's fee.
- 2. Expenses of Contractor's principal and branch offices other than Contractor's office at the Site.
- 3. Any part of Contractor's capital expenses, including interest on Contractor's capital employed for the Work and charges against Contractor for delinquent payments.
- 4. Costs due to the negligence of Contractor, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable, including but not limited to, the correction of defective Work, disposal of materials or equipment wrongly supplied, and making good any damage to property.
- 5. Other overhead or general expense costs of any kind and the costs of any item not specifically and expressly included in Paragraphs 11.01.A.

- C. *Contractor's Fee:* When all the Work is performed on the basis of cost-plus, Contractor's fee shall be determined as set forth in the Agreement. When the value of any Work covered by a Change Order or when a Claim for an adjustment in Contract Price is determined on the basis of Cost of the Work, Contractor's fee shall be determined as set forth in Paragraph 12.01.C.
- D. *Documentation:* Whenever the Cost of the Work for any purpose is to be determined pursuant to Paragraphs 11.01.A and 11.01.B, Contractor will establish and maintain records thereof in accordance with generally accepted accounting practices and submit in a form acceptable to Engineer an itemized cost breakdown together with supporting data.

11.02 *Allowances*

- A. It is understood that Contractor has included in the Contract Price all allowances so named in the Contract Documents and shall cause the Work so covered to be performed for such sums and by such persons or entities as may be acceptable to Owner and Engineer.
- B. *Cash Allowances:*
 - 1. Contractor agrees that:
 - a. the cash allowances include the cost to Contractor (less any applicable trade discounts) of materials and equipment required by the allowances to be delivered at the Site, and all applicable taxes; and
 - b. Contractor's costs for unloading and handling on the Site, labor, installation, overhead, profit, and other expenses contemplated for the cash allowances have been included in the Contract Price and not in the allowances, and no demand for additional payment on account of any of the foregoing will be valid.
- C. *Contingency Allowance:*
 - 1. Contractor agrees that a contingency allowance, if any, is for the sole use of Owner to cover unanticipated costs.
- D. Prior to final payment, an appropriate Change Order will be issued as recommended by Engineer to reflect actual amounts due Contractor on account of Work covered by allowances, and the Contract Price shall be correspondingly adjusted.

11.03 *Unit Price Work*

- A. Where the Contract Documents provide that all or part of the Work is to be Unit Price Work, initially the Contract Price will be deemed to include for all Unit Price Work an amount equal to the sum of the unit price for each separately identified item of Unit Price Work times the estimated quantity of each item as indicated in the Agreement.
- B. The estimated quantities of items of Unit Price Work are not guaranteed and are solely for the purpose of comparison of Bids and determining an initial Contract Price. Determinations of the actual quantities and classifications of Unit Price Work performed by Contractor will be made by Engineer subject to the provisions of Paragraph 9.07.

- C. Each unit price will be deemed to include an amount considered by Contractor to be adequate to cover Contractor's overhead and profit for each separately identified item.
- D. Owner or Contractor may make a Claim for an adjustment in the Contract Price in accordance with Paragraph 10.05 if:
 - 1. the quantity of any item of Unit Price Work performed by Contractor differs materially and significantly from the estimated quantity of such item indicated in the Agreement; and
 - 2. there is no corresponding adjustment with respect to any other item of Work; and
 - 3. Contractor believes that Contractor is entitled to an increase in Contract Price as a result of having incurred additional expense or Owner believes that Owner is entitled to a decrease in Contract Price and the parties are unable to agree as to the amount of any such increase or decrease.

ARTICLE 12 – CHANGE OF CONTRACT PRICE; CHANGE OF CONTRACT TIMES

12.01 *Change of Contract Price*

- A. The Contract Price may only be changed by a Change Order. Any Claim for an adjustment in the Contract Price shall be based on written notice submitted by the party making the Claim to the Engineer and the other party to the Contract in accordance with the provisions of Paragraph 10.05.
- B. The value of any Work covered by a Change Order or of any Claim for an adjustment in the Contract Price will be determined as follows:
 - 1. where the Work involved is covered by unit prices contained in the Contract Documents, by application of such unit prices to the quantities of the items involved (subject to the provisions of Paragraph 11.03); or
 - 2. where the Work involved is not covered by unit prices contained in the Contract Documents, by a mutually agreed lump sum (which may include an allowance for overhead and profit not necessarily in accordance with Paragraph 12.01.C.2); or
 - 3. where the Work involved is not covered by unit prices contained in the Contract Documents and agreement to a lump sum is not reached under Paragraph 12.01.B.2, on the basis of the Cost of the Work (determined as provided in Paragraph 11.01) plus a Contractor's fee for overhead and profit (determined as provided in Paragraph 12.01.C).
- C. *Contractor's Fee:* The Contractor's fee for overhead and profit shall be determined as follows:
 - 1. a mutually acceptable fixed fee; or
 - 2. if a fixed fee is not agreed upon, then a fee based on the following percentages of the various portions of the Cost of the Work:
 - a. for costs incurred under Paragraphs 11.01.A.1 and 11.01.A.2, the Contractor's fee shall be 15 percent;

- b. for costs incurred under Paragraph 11.01.A.3, the Contractor's fee shall be five percent;
- c. where one or more tiers of subcontracts are on the basis of Cost of the Work plus a fee and no fixed fee is agreed upon, the intent of Paragraphs 12.01.C.2.a and 12.01.C.2.b is that the Subcontractor who actually performs the Work, at whatever tier, will be paid a fee of 15 percent of the costs incurred by such Subcontractor under Paragraphs 11.01.A.1 and 11.01.A.2 and that any higher tier Subcontractor and Contractor will each be paid a fee of five percent of the amount paid to the next lower tier Subcontractor;
- d. no fee shall be payable on the basis of costs itemized under Paragraphs 11.01.A.4, 11.01.A.5, and 11.01.B;
- e. the amount of credit to be allowed by Contractor to Owner for any change which results in a net decrease in cost will be the amount of the actual net decrease in cost plus a deduction in Contractor's fee by an amount equal to five percent of such net decrease; and
- f. when both additions and credits are involved in any one change, the adjustment in Contractor's fee shall be computed on the basis of the net change in accordance with Paragraphs 12.01.C.2.a through 12.01.C.2.e, inclusive.

12.02 *Change of Contract Times*

- A. The Contract Times may only be changed by a Change Order. Any Claim for an adjustment in the Contract Times shall be based on written notice submitted by the party making the Claim to the Engineer and the other party to the Contract in accordance with the provisions of Paragraph 10.05.
- B. Any adjustment of the Contract Times covered by a Change Order or any Claim for an adjustment in the Contract Times will be determined in accordance with the provisions of this Article 12.

12.03 *Delays*

- A. Where Contractor is prevented from completing any part of the Work within the Contract Times due to delay beyond the control of Contractor, the Contract Times will be extended in an amount equal to the time lost due to such delay if a Claim is made therefor as provided in Paragraph 12.02.A. Delays beyond the control of Contractor shall include, but not be limited to, acts or neglect by Owner, acts or neglect of utility owners or other contractors performing other work as contemplated by Article 7, fires, floods, epidemics, abnormal weather conditions, or acts of God.
- B. If Owner, Engineer, or other contractors or utility owners performing other work for Owner as contemplated by Article 7, or anyone for whom Owner is responsible, delays, disrupts, or interferes with the performance or progress of the Work, then Contractor shall be entitled to an equitable adjustment in the Contract Price or the Contract Times, or both. Contractor's entitlement to an adjustment of the Contract Times is conditioned on such adjustment being essential to Contractor's ability to complete the Work within the Contract Times.

- C. If Contractor is delayed in the performance or progress of the Work by fire, flood, epidemic, abnormal weather conditions, acts of God, acts or failures to act of utility owners not under the control of Owner, or other causes not the fault of and beyond control of Owner and Contractor, then Contractor shall be entitled to an equitable adjustment in Contract Times, if such adjustment is essential to Contractor's ability to complete the Work within the Contract Times. Such an adjustment shall be Contractor's sole and exclusive remedy for the delays described in this Paragraph 12.03.C.
- D. Owner, Engineer, and their officers, directors, members, partners, employees, agents, consultants, or subcontractors shall not be liable to Contractor for any claims, costs, losses, or damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) sustained by Contractor on or in connection with any other project or anticipated project.
- E. Contractor shall not be entitled to an adjustment in Contract Price or Contract Times for delays within the control of Contractor. Delays attributable to and within the control of a Subcontractor or Supplier shall be deemed to be delays within the control of Contractor.

ARTICLE 13 – TESTS AND INSPECTIONS; CORRECTION, REMOVAL OR ACCEPTANCE OF DEFECTIVE WORK

13.01 Notice of Defects

- A. Prompt notice of all defective Work of which Owner or Engineer has actual knowledge will be given to Contractor. Defective Work may be rejected, corrected, or accepted as provided in this Article 13.

13.02 Access to Work

- A. Owner, Engineer, their consultants and other representatives and personnel of Owner, independent testing laboratories, and governmental agencies with jurisdictional interests will have access to the Site and the Work at reasonable times for their observation, inspection, and testing. Contractor shall provide them proper and safe conditions for such access and advise them of Contractor's safety procedures and programs so that they may comply therewith as applicable.

13.03 Tests and Inspections

- A. Contractor shall give Engineer timely notice of readiness of the Work for all required inspections, tests, or approvals and shall cooperate with inspection and testing personnel to facilitate required inspections or tests.
- B. Owner shall employ and pay for the services of an independent testing laboratory to perform all inspections, tests, or approvals required by the Contract Documents except:
 - 1. for inspections, tests, or approvals covered by Paragraphs 13.03.C and 13.03.D below;
 - 2. that costs incurred in connection with tests or inspections conducted pursuant to Paragraph 13.04.B shall be paid as provided in Paragraph 13.04.C; and

3. as otherwise specifically provided in the Contract Documents.
- C. If Laws or Regulations of any public body having jurisdiction require any Work (or part thereof) specifically to be inspected, tested, or approved by an employee or other representative of such public body, Contractor shall assume full responsibility for arranging and obtaining such inspections, tests, or approvals, pay all costs in connection therewith, and furnish Engineer the required certificates of inspection or approval.
 - D. Contractor shall be responsible for arranging and obtaining and shall pay all costs in connection with any inspections, tests, or approvals required for Owner's and Engineer's acceptance of materials or equipment to be incorporated in the Work; or acceptance of materials, mix designs, or equipment submitted for approval prior to Contractor's purchase thereof for incorporation in the Work. Such inspections, tests, or approvals shall be performed by organizations acceptable to Owner and Engineer.
 - E. If any Work (or the work of others) that is to be inspected, tested, or approved is covered by Contractor without written concurrence of Engineer, Contractor shall, if requested by Engineer, uncover such Work for observation.
 - F. Uncovering Work as provided in Paragraph 13.03.E shall be at Contractor's expense unless Contractor has given Engineer timely notice of Contractor's intention to cover the same and Engineer has not acted with reasonable promptness in response to such notice.

13.04 *Uncovering Work*

- A. If any Work is covered contrary to the written request of Engineer, it must, if requested by Engineer, be uncovered for Engineer's observation and replaced at Contractor's expense.
- B. If Engineer considers it necessary or advisable that covered Work be observed by Engineer or inspected or tested by others, Contractor, at Engineer's request, shall uncover, expose, or otherwise make available for observation, inspection, or testing as Engineer may require, that portion of the Work in question, furnishing all necessary labor, material, and equipment.
- C. If it is found that the uncovered Work is defective, Contractor shall pay all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such uncovering, exposure, observation, inspection, and testing, and of satisfactory replacement or reconstruction (including but not limited to all costs of repair or replacement of work of others); and Owner shall be entitled to an appropriate decrease in the Contract Price. If the parties are unable to agree as to the amount thereof, Owner may make a Claim therefor as provided in Paragraph 10.05.
- D. If the uncovered Work is not found to be defective, Contractor shall be allowed an increase in the Contract Price or an extension of the Contract Times, or both, directly attributable to such uncovering, exposure, observation, inspection, testing, replacement, and reconstruction. If the parties are unable to agree as to the amount or extent thereof, Contractor may make a Claim therefor as provided in Paragraph 10.05.

13.05 *Owner May Stop the Work*

- A. If the Work is defective, or Contractor fails to supply sufficient skilled workers or suitable materials or equipment, or fails to perform the Work in such a way that the completed Work will conform to the Contract Documents, Owner may order Contractor to stop the Work, or any portion thereof, until the cause for such order has been eliminated; however, this right of Owner to stop the Work shall not give rise to any duty on the part of Owner to exercise this right for the benefit of Contractor, any Subcontractor, any Supplier, any other individual or entity, or any surety for, or employee or agent of any of them.

13.06 *Correction or Removal of Defective Work*

- A. Promptly after receipt of written notice, Contractor shall correct all defective Work, whether or not fabricated, installed, or completed, or, if the Work has been rejected by Engineer, remove it from the Project and replace it with Work that is not defective. Contractor shall pay all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such correction or removal (including but not limited to all costs of repair or replacement of work of others).
- B. When correcting defective Work under the terms of this Paragraph 13.06 or Paragraph 13.07, Contractor shall take no action that would void or otherwise impair Owner's special warranty and guarantee, if any, on said Work.

13.07 *Correction Period*

- A. If within one year after the date of Substantial Completion (or such longer period of time as may be prescribed by the terms of any applicable special guarantee required by the Contract Documents) or by any specific provision of the Contract Documents, any Work is found to be defective, or if the repair of any damages to the land or areas made available for Contractor's use by Owner or permitted by Laws and Regulations as contemplated in Paragraph 6.11.A is found to be defective, Contractor shall promptly, without cost to Owner and in accordance with Owner's written instructions:
 - 1. repair such defective land or areas; or
 - 2. correct such defective Work; or
 - 3. if the defective Work has been rejected by Owner, remove it from the Project and replace it with Work that is not defective, and
 - 4. satisfactorily correct or repair or remove and replace any damage to other Work, to the work of others or other land or areas resulting therefrom.
- B. If Contractor does not promptly comply with the terms of Owner's written instructions, or in an emergency where delay would cause serious risk of loss or damage, Owner may have the defective Work corrected or repaired or may have the rejected Work removed and replaced. All claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute

resolution costs) arising out of or relating to such correction or repair or such removal and replacement (including but not limited to all costs of repair or replacement of work of others) will be paid by Contractor.

- C. In special circumstances where a particular item of equipment is placed in continuous service before Substantial Completion of all the Work, the correction period for that item may start to run from an earlier date if so provided in the Specifications.
- D. Where defective Work (and damage to other Work resulting therefrom) has been corrected or removed and replaced under this Paragraph 13.07, the correction period hereunder with respect to such Work will be extended for an additional period of one year after such correction or removal and replacement has been satisfactorily completed.
- E. Contractor's obligations under this Paragraph 13.07 are in addition to any other obligation or warranty. The provisions of this Paragraph 13.07 shall not be construed as a substitute for, or a waiver of, the provisions of any applicable statute of limitation or repose.

13.08 *Acceptance of Defective Work*

- A. If, instead of requiring correction or removal and replacement of defective Work, Owner (and, prior to Engineer's recommendation of final payment, Engineer) prefers to accept it, Owner may do so. Contractor shall pay all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) attributable to Owner's evaluation of and determination to accept such defective Work (such costs to be approved by Engineer as to reasonableness) and for the diminished value of the Work to the extent not otherwise paid by Contractor pursuant to this sentence. If any such acceptance occurs prior to Engineer's recommendation of final payment, a Change Order will be issued incorporating the necessary revisions in the Contract Documents with respect to the Work, and Owner shall be entitled to an appropriate decrease in the Contract Price, reflecting the diminished value of Work so accepted. If the parties are unable to agree as to the amount thereof, Owner may make a Claim therefor as provided in Paragraph 10.05. If the acceptance occurs after such recommendation, an appropriate amount will be paid by Contractor to Owner.

13.09 *Owner May Correct Defective Work*

- A. If Contractor fails within a reasonable time after written notice from Engineer to correct defective Work, or to remove and replace rejected Work as required by Engineer in accordance with Paragraph 13.06.A, or if Contractor fails to perform the Work in accordance with the Contract Documents, or if Contractor fails to comply with any other provision of the Contract Documents, Owner may, after seven days written notice to Contractor, correct, or remedy any such deficiency.
- B. In exercising the rights and remedies under this Paragraph 13.09, Owner shall proceed expeditiously. In connection with such corrective or remedial action, Owner may exclude Contractor from all or part of the Site, take possession of all or part of the Work and suspend Contractor's services related thereto, take possession of Contractor's tools, appliances, construction equipment and machinery at the Site, and incorporate in the Work all materials and equipment stored at the Site or for which Owner has paid Contractor but which are stored

elsewhere. Contractor shall allow Owner, Owner's representatives, agents and employees, Owner's other contractors, and Engineer and Engineer's consultants access to the Site to enable Owner to exercise the rights and remedies under this Paragraph.

- C. All claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) incurred or sustained by Owner in exercising the rights and remedies under this Paragraph 13.09 will be charged against Contractor, and a Change Order will be issued incorporating the necessary revisions in the Contract Documents with respect to the Work; and Owner shall be entitled to an appropriate decrease in the Contract Price. If the parties are unable to agree as to the amount of the adjustment, Owner may make a Claim therefor as provided in Paragraph 10.05. Such claims, costs, losses and damages will include but not be limited to all costs of repair, or replacement of work of others destroyed or damaged by correction, removal, or replacement of Contractor's defective Work.
- D. Contractor shall not be allowed an extension of the Contract Times because of any delay in the performance of the Work attributable to the exercise by Owner of Owner's rights and remedies under this Paragraph 13.09.

ARTICLE 14 – PAYMENTS TO CONTRACTOR AND COMPLETION

14.01 *Schedule of Values*

- A. The Schedule of Values established as provided in Paragraph 2.07.A will serve as the basis for progress payments and will be incorporated into a form of Application for Payment acceptable to Engineer. Progress payments on account of Unit Price Work will be based on the number of units completed.

14.02 *Progress Payments*

A. *Applications for Payments:*

1. At least 20 days before the date established in the Agreement for each progress payment (but not more often than once a month), Contractor shall submit to Engineer for review an Application for Payment filled out and signed by Contractor covering the Work completed as of the date of the Application and accompanied by such supporting documentation as is required by the Contract Documents. If payment is requested on the basis of materials and equipment not incorporated in the Work but delivered and suitably stored at the Site or at another location agreed to in writing, the Application for Payment shall also be accompanied by a bill of sale, invoice, or other documentation warranting that Owner has received the materials and equipment free and clear of all Liens and evidence that the materials and equipment are covered by appropriate property insurance or other arrangements to protect Owner's interest therein, all of which must be satisfactory to Owner.
2. Beginning with the second Application for Payment, each Application shall include an affidavit of Contractor stating that all previous progress payments received on account of the Work have been applied on account to discharge Contractor's legitimate obligations associated with prior Applications for Payment.

3. The amount of retainage with respect to progress payments will be as stipulated in the Agreement.

B. Review of Applications:

1. Engineer will, within 10 days after receipt of each Application for Payment, either indicate in writing a recommendation of payment and present the Application to Owner or return the Application to Contractor indicating in writing Engineer's reasons for refusing to recommend payment. In the latter case, Contractor may make the necessary corrections and resubmit the Application.
2. Engineer's recommendation of any payment requested in an Application for Payment will constitute a representation by Engineer to Owner, based on Engineer's observations of the executed Work as an experienced and qualified design professional, and on Engineer's review of the Application for Payment and the accompanying data and schedules, that to the best of Engineer's knowledge, information and belief:
 - a. the Work has progressed to the point indicated;
 - b. the quality of the Work is generally in accordance with the Contract Documents (subject to an evaluation of the Work as a functioning whole prior to or upon Substantial Completion, the results of any subsequent tests called for in the Contract Documents, a final determination of quantities and classifications for Unit Price Work under Paragraph 9.07, and any other qualifications stated in the recommendation); and
 - c. the conditions precedent to Contractor's being entitled to such payment appear to have been fulfilled in so far as it is Engineer's responsibility to observe the Work.
3. By recommending any such payment Engineer will not thereby be deemed to have represented that:
 - a. inspections made to check the quality or the quantity of the Work as it has been performed have been exhaustive, extended to every aspect of the Work in progress, or involved detailed inspections of the Work beyond the responsibilities specifically assigned to Engineer in the Contract Documents; or
 - b. there may not be other matters or issues between the parties that might entitle Contractor to be paid additionally by Owner or entitle Owner to withhold payment to Contractor.
4. Neither Engineer's review of Contractor's Work for the purposes of recommending payments nor Engineer's recommendation of any payment, including final payment, will impose responsibility on Engineer:
 - a. to supervise, direct, or control the Work, or
 - b. for the means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or
 - c. for Contractor's failure to comply with Laws and Regulations applicable to Contractor's performance of the Work, or

- d. to make any examination to ascertain how or for what purposes Contractor has used the moneys paid on account of the Contract Price, or
 - e. to determine that title to any of the Work, materials, or equipment has passed to Owner free and clear of any Liens.
5. Engineer may refuse to recommend the whole or any part of any payment if, in Engineer's opinion, it would be incorrect to make the representations to Owner stated in Paragraph 14.02.B.2. Engineer may also refuse to recommend any such payment or, because of subsequently discovered evidence or the results of subsequent inspections or tests, revise or revoke any such payment recommendation previously made, to such extent as may be necessary in Engineer's opinion to protect Owner from loss because:
- a. the Work is defective, or completed Work has been damaged, requiring correction or replacement;
 - b. the Contract Price has been reduced by Change Orders;
 - c. Owner has been required to correct defective Work or complete Work in accordance with Paragraph 13.09; or
 - d. Engineer has actual knowledge of the occurrence of any of the events enumerated in Paragraph 15.02.A.

C. Payment Becomes Due:

1. Ten days after presentation of the Application for Payment to Owner with Engineer's recommendation, the amount recommended will (subject to the provisions of Paragraph 14.02.D) become due, and when due will be paid by Owner to Contractor.

D. Reduction in Payment:

1. Owner may refuse to make payment of the full amount recommended by Engineer because:
- a. claims have been made against Owner on account of Contractor's performance or furnishing of the Work;
 - b. Liens have been filed in connection with the Work, except where Contractor has delivered a specific bond satisfactory to Owner to secure the satisfaction and discharge of such Liens;
 - c. there are other items entitling Owner to a set-off against the amount recommended; or
 - d. Owner has actual knowledge of the occurrence of any of the events enumerated in Paragraphs 14.02.B.5.a through 14.02.B.5.c or Paragraph 15.02.A.
2. If Owner refuses to make payment of the full amount recommended by Engineer, Owner will give Contractor immediate written notice (with a copy to Engineer) stating the reasons for such action and promptly pay Contractor any amount remaining after deduction of the amount so withheld. Owner shall promptly pay Contractor the amount so withheld, or any

adjustment thereto agreed to by Owner and Contractor, when Contractor remedies the reasons for such action.

3. Upon a subsequent determination that Owner's refusal of payment was not justified, the amount wrongfully withheld shall be treated as an amount due as determined by Paragraph 14.02.C.1 and subject to interest as provided in the Agreement.

14.03 *Contractor's Warranty of Title*

- A. Contractor warrants and guarantees that title to all Work, materials, and equipment covered by any Application for Payment, whether incorporated in the Project or not, will pass to Owner no later than the time of payment free and clear of all Liens.

14.04 *Substantial Completion*

- A. When Contractor considers the entire Work ready for its intended use Contractor shall notify Owner and Engineer in writing that the entire Work is substantially complete (except for items specifically listed by Contractor as incomplete) and request that Engineer issue a certificate of Substantial Completion.
- B. Promptly after Contractor's notification, Owner, Contractor, and Engineer shall make an inspection of the Work to determine the status of completion. If Engineer does not consider the Work substantially complete, Engineer will notify Contractor in writing giving the reasons therefor.
- C. If Engineer considers the Work substantially complete, Engineer will deliver to Owner a tentative certificate of Substantial Completion which shall fix the date of Substantial Completion. There shall be attached to the certificate a tentative list of items to be completed or corrected before final payment. Owner shall have seven days after receipt of the tentative certificate during which to make written objection to Engineer as to any provisions of the certificate or attached list. If, after considering such objections, Engineer concludes that the Work is not substantially complete, Engineer will, within 14 days after submission of the tentative certificate to Owner, notify Contractor in writing, stating the reasons therefor. If, after consideration of Owner's objections, Engineer considers the Work substantially complete, Engineer will, within said 14 days, execute and deliver to Owner and Contractor a definitive certificate of Substantial Completion (with a revised tentative list of items to be completed or corrected) reflecting such changes from the tentative certificate as Engineer believes justified after consideration of any objections from Owner.
- D. At the time of delivery of the tentative certificate of Substantial Completion, Engineer will deliver to Owner and Contractor a written recommendation as to division of responsibilities pending final payment between Owner and Contractor with respect to security, operation, safety, and protection of the Work, maintenance, heat, utilities, insurance, and warranties and guarantees. Unless Owner and Contractor agree otherwise in writing and so inform Engineer in writing prior to Engineer's issuing the definitive certificate of Substantial Completion, Engineer's aforesaid recommendation will be binding on Owner and Contractor until final payment.

- E. Owner shall have the right to exclude Contractor from the Site after the date of Substantial Completion subject to allowing Contractor reasonable access to remove its property and complete or correct items on the tentative list.

14.05 *Partial Utilization*

- A. Prior to Substantial Completion of all the Work, Owner may use or occupy any substantially completed part of the Work which has specifically been identified in the Contract Documents, or which Owner, Engineer, and Contractor agree constitutes a separately functioning and usable part of the Work that can be used by Owner for its intended purpose without significant interference with Contractor's performance of the remainder of the Work, subject to the following conditions:
 - 1. Owner at any time may request Contractor in writing to permit Owner to use or occupy any such part of the Work which Owner believes to be ready for its intended use and substantially complete. If and when Contractor agrees that such part of the Work is substantially complete, Contractor, Owner, and Engineer will follow the procedures of Paragraph 14.04.A through D for that part of the Work.
 - 2. Contractor at any time may notify Owner and Engineer in writing that Contractor considers any such part of the Work ready for its intended use and substantially complete and request Engineer to issue a certificate of Substantial Completion for that part of the Work.
 - 3. Within a reasonable time after either such request, Owner, Contractor, and Engineer shall make an inspection of that part of the Work to determine its status of completion. If Engineer does not consider that part of the Work to be substantially complete, Engineer will notify Owner and Contractor in writing giving the reasons therefor. If Engineer considers that part of the Work to be substantially complete, the provisions of Paragraph 14.04 will apply with respect to certification of Substantial Completion of that part of the Work and the division of responsibility in respect thereof and access thereto.
 - 4. No use or occupancy or separate operation of part of the Work may occur prior to compliance with the requirements of Paragraph 5.10 regarding property insurance.

14.06 *Final Inspection*

- A. Upon written notice from Contractor that the entire Work or an agreed portion thereof is complete, Engineer will promptly make a final inspection with Owner and Contractor and will notify Contractor in writing of all particulars in which this inspection reveals that the Work is incomplete or defective. Contractor shall immediately take such measures as are necessary to complete such Work or remedy such deficiencies.

14.07 *Final Payment*

A. Application for Payment:

1. After Contractor has, in the opinion of Engineer, satisfactorily completed all corrections identified during the final inspection and has delivered, in accordance with the Contract Documents, all maintenance and operating instructions, schedules, guarantees, bonds, certificates or other evidence of insurance, certificates of inspection, marked-up record documents (as provided in Paragraph 6.12), and other documents, Contractor may make application for final payment following the procedure for progress payments.
2. The final Application for Payment shall be accompanied (except as previously delivered) by:
 - a. all documentation called for in the Contract Documents, including but not limited to the evidence of insurance required by Paragraph 5.04.B.6;
 - b. consent of the surety, if any, to final payment;
 - c. a list of all Claims against Owner that Contractor believes are unsettled; and
 - d. complete and legally effective releases or waivers (satisfactory to Owner) of all Lien rights arising out of or Liens filed in connection with the Work.
3. In lieu of the releases or waivers of Liens specified in Paragraph 14.07.A.2 and as approved by Owner, Contractor may furnish receipts or releases in full and an affidavit of Contractor that: (i) the releases and receipts include all labor, services, material, and equipment for which a Lien could be filed; and (ii) all payrolls, material and equipment bills, and other indebtedness connected with the Work for which Owner might in any way be responsible, or which might in any way result in liens or other burdens on Owner's property, have been paid or otherwise satisfied. If any Subcontractor or Supplier fails to furnish such a release or receipt in full, Contractor may furnish a bond or other collateral satisfactory to Owner to indemnify Owner against any Lien.

B. Engineer's Review of Application and Acceptance:

1. If, on the basis of Engineer's observation of the Work during construction and final inspection, and Engineer's review of the final Application for Payment and accompanying documentation as required by the Contract Documents, Engineer is satisfied that the Work has been completed and Contractor's other obligations under the Contract Documents have been fulfilled, Engineer will, within ten days after receipt of the final Application for Payment, indicate in writing Engineer's recommendation of payment and present the Application for Payment to Owner for payment. At the same time Engineer will also give written notice to Owner and Contractor that the Work is acceptable subject to the provisions of Paragraph 14.09. Otherwise, Engineer will return the Application for Payment to Contractor, indicating in writing the reasons for refusing to recommend final payment, in which case Contractor shall make the necessary corrections and resubmit the Application for Payment.

C. Payment Becomes Due:

1. Thirty days after the presentation to Owner of the Application for Payment and accompanying documentation, the amount recommended by Engineer, less any sum Owner is entitled to set off against Engineer's recommendation, including but not limited to liquidated damages, will become due and will be paid by Owner to Contractor.

14.08 *Final Completion Delayed*

- A. If, through no fault of Contractor, final completion of the Work is significantly delayed, and if Engineer so confirms, Owner shall, upon receipt of Contractor's final Application for Payment (for Work fully completed and accepted) and recommendation of Engineer, and without terminating the Contract, make payment of the balance due for that portion of the Work fully completed and accepted. If the remaining balance to be held by Owner for Work not fully completed or corrected is less than the retainage stipulated in the Agreement, and if bonds have been furnished as required in Paragraph 5.01, the written consent of the surety to the payment of the balance due for that portion of the Work fully completed and accepted shall be submitted by Contractor to Engineer with the Application for such payment. Such payment shall be made under the terms and conditions governing final payment, except that it shall not constitute a waiver of Claims.

14.09 *Waiver of Claims*

- A. The making and acceptance of final payment will constitute:
 1. a waiver of all Claims by Owner against Contractor, except Claims arising from unsettled Liens, from defective Work appearing after final inspection pursuant to Paragraph 14.06, from failure to comply with the Contract Documents or the terms of any special guarantees specified therein, or from Contractor's continuing obligations under the Contract Documents; and
 2. a waiver of all Claims by Contractor against Owner other than those previously made in accordance with the requirements herein and expressly acknowledged by Owner in writing as still unsettled.

ARTICLE 15 – SUSPENSION OF WORK AND TERMINATION

15.01 *Owner May Suspend Work*

- A. At any time and without cause, Owner may suspend the Work or any portion thereof for a period of not more than 90 consecutive days by notice in writing to Contractor and Engineer which will fix the date on which Work will be resumed. Contractor shall resume the Work on the date so fixed. Contractor shall be granted an adjustment in the Contract Price or an extension of the Contract Times, or both, directly attributable to any such suspension if Contractor makes a Claim therefor as provided in Paragraph 10.05.

15.02 *Owner May Terminate for Cause*

- A. The occurrence of any one or more of the following events will justify termination for cause:
 1. Contractor's persistent failure to perform the Work in accordance with the Contract Documents (including, but not limited to, failure to supply sufficient skilled workers or

suitable materials or equipment or failure to adhere to the Progress Schedule established under Paragraph 2.07 as adjusted from time to time pursuant to Paragraph 6.04);

2. Contractor's disregard of Laws or Regulations of any public body having jurisdiction;
 3. Contractor's repeated disregard of the authority of Engineer; or
 4. Contractor's violation in any substantial way of any provisions of the Contract Documents.
- B. If one or more of the events identified in Paragraph 15.02.A occur, Owner may, after giving Contractor (and surety) seven days written notice of its intent to terminate the services of Contractor:
1. exclude Contractor from the Site, and take possession of the Work and of all Contractor's tools, appliances, construction equipment, and machinery at the Site, and use the same to the full extent they could be used by Contractor (without liability to Contractor for trespass or conversion);
 2. incorporate in the Work all materials and equipment stored at the Site or for which Owner has paid Contractor but which are stored elsewhere; and
 3. complete the Work as Owner may deem expedient.
- C. If Owner proceeds as provided in Paragraph 15.02.B, Contractor shall not be entitled to receive any further payment until the Work is completed. If the unpaid balance of the Contract Price exceeds all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) sustained by Owner arising out of or relating to completing the Work, such excess will be paid to Contractor. If such claims, costs, losses, and damages exceed such unpaid balance, Contractor shall pay the difference to Owner. Such claims, costs, losses, and damages incurred by Owner will be reviewed by Engineer as to their reasonableness and, when so approved by Engineer, incorporated in a Change Order. When exercising any rights or remedies under this Paragraph, Owner shall not be required to obtain the lowest price for the Work performed.
- D. Notwithstanding Paragraphs 15.02.B and 15.02.C, Contractor's services will not be terminated if Contractor begins within seven days of receipt of notice of intent to terminate to correct its failure to perform and proceeds diligently to cure such failure within no more than 30 days of receipt of said notice.
- E. Where Contractor's services have been so terminated by Owner, the termination will not affect any rights or remedies of Owner against Contractor then existing or which may thereafter accrue. Any retention or payment of moneys due Contractor by Owner will not release Contractor from liability.
- F. If and to the extent that Contractor has provided a performance bond under the provisions of Paragraph 5.01.A, the termination procedures of that bond shall supersede the provisions of Paragraphs 15.02.B and 15.02.C.

15.03 *Owner May Terminate For Convenience*

- A. Upon seven days written notice to Contractor and Engineer, Owner may, without cause and without prejudice to any other right or remedy of Owner, terminate the Contract. In such case, Contractor shall be paid for (without duplication of any items):
 - 1. completed and acceptable Work executed in accordance with the Contract Documents prior to the effective date of termination, including fair and reasonable sums for overhead and profit on such Work;
 - 2. expenses sustained prior to the effective date of termination in performing services and furnishing labor, materials, or equipment as required by the Contract Documents in connection with uncompleted Work, plus fair and reasonable sums for overhead and profit on such expenses;
 - 3. all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) incurred in settlement of terminated contracts with Subcontractors, Suppliers, and others; and
 - 4. reasonable expenses directly attributable to termination.
- B. Contractor shall not be paid on account of loss of anticipated profits or revenue or other economic loss arising out of or resulting from such termination.

15.04 *Contractor May Stop Work or Terminate*

- A. If, through no act or fault of Contractor, (i) the Work is suspended for more than 90 consecutive days by Owner or under an order of court or other public authority, or (ii) Engineer fails to act on any Application for Payment within 30 days after it is submitted, or (iii) Owner fails for 30 days to pay Contractor any sum finally determined to be due, then Contractor may, upon seven days written notice to Owner and Engineer, and provided Owner or Engineer do not remedy such suspension or failure within that time, terminate the Contract and recover from Owner payment on the same terms as provided in Paragraph 15.03.
- B. In lieu of terminating the Contract and without prejudice to any other right or remedy, if Engineer has failed to act on an Application for Payment within 30 days after it is submitted, or Owner has failed for 30 days to pay Contractor any sum finally determined to be due, Contractor may, seven days after written notice to Owner and Engineer, stop the Work until payment is made of all such amounts due Contractor, including interest thereon. The provisions of this Paragraph 15.04 are not intended to preclude Contractor from making a Claim under Paragraph 10.05 for an adjustment in Contract Price or Contract Times or otherwise for expenses or damage directly attributable to Contractor's stopping the Work as permitted by this Paragraph.

ARTICLE 16 – DISPUTE RESOLUTION

16.01 *Methods and Procedures*

- A. Either Owner or Contractor may request mediation of any Claim submitted to Engineer for a decision under Paragraph 10.05 before such decision becomes final and binding. The mediation

will be governed by the Construction Industry Mediation Rules of the American Arbitration Association in effect as of the Effective Date of the Agreement. The request for mediation shall be submitted in writing to the American Arbitration Association and the other party to the Contract. Timely submission of the request shall stay the effect of Paragraph 10.05.E.

- B. Owner and Contractor shall participate in the mediation process in good faith. The process shall be concluded within 60 days of filing of the request. The date of termination of the mediation shall be determined by application of the mediation rules referenced above.
- C. If the Claim is not resolved by mediation, Engineer's action under Paragraph 10.05.C or a denial pursuant to Paragraphs 10.05.C.3 or 10.05.D shall become final and binding 30 days after termination of the mediation unless, within that time period, Owner or Contractor:
 - 1. elects in writing to invoke any dispute resolution process provided for in the Supplementary Conditions; or
 - 2. agrees with the other party to submit the Claim to another dispute resolution process; or
 - 3. gives written notice to the other party of the intent to submit the Claim to a court of competent jurisdiction.

ARTICLE 17 – MISCELLANEOUS

17.01 *Giving Notice*

- A. Whenever any provision of the Contract Documents requires the giving of written notice, it will be deemed to have been validly given if:
 - 1. delivered in person to the individual or to a member of the firm or to an officer of the corporation for whom it is intended; or
 - 2. delivered at or sent by registered or certified mail, postage prepaid, to the last business address known to the giver of the notice.

17.02 *Computation of Times*

- A. When any period of time is referred to in the Contract Documents by days, it will be computed to exclude the first and include the last day of such period. If the last day of any such period falls on a Saturday or Sunday or on a day made a legal holiday by the law of the applicable jurisdiction, such day will be omitted from the computation.

17.03 *Cumulative Remedies*

- A. The duties and obligations imposed by these General Conditions and the rights and remedies available hereunder to the parties hereto are in addition to, and are not to be construed in any way as a limitation of, any rights and remedies available to any or all of them which are otherwise imposed or available by Laws or Regulations, by special warranty or guarantee, or by other provisions of the Contract Documents. The provisions of this Paragraph will be as effective as if repeated specifically in the Contract Documents in connection with each particular duty, obligation, right, and remedy to which they apply.

17.04 *Survival of Obligations*

- A. All representations, indemnifications, warranties, and guarantees made in, required by, or given in accordance with the Contract Documents, as well as all continuing obligations indicated in the Contract Documents, will survive final payment, completion, and acceptance of the Work or termination or completion of the Contract or termination of the services of Contractor.

17.05 *Controlling Law*

- A. This Contract is to be governed by the law of the state in which the Project is located.

17.06 *Headings*

- A. Article and paragraph headings are inserted for convenience only and do not constitute parts of these General Conditions.

**SECTION 00 7300
SUPPLEMENTARY CONDITIONS**

The following supplements modify the "Standard General Conditions of the Construction Contract", EJCDC Document C-700, 2007 Edition. Where a portion of the General Conditions is modified or deleted by these Supplementary Conditions, the unaltered portions of the General Conditions shall remain in effect.

ADDITIONAL CONDITIONS

1. During the performance of this contract, the contractor agrees as follows:

(1) The contractor will not discriminate against any employee or applicant for employment because of race, color, religion, sex, sexual orientation, gender identity, or national origin. The contractor will take affirmative action to ensure that applicants are employed, and that employees are treated during employment without regard to their race, color, religion, sex, sexual orientation, gender identity, or national origin. Such action shall include, but not be limited to the following: Employment, upgrading, demotion, or transfer; recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship. The contractor agrees to post in conspicuous places, available to employees and applicants for employment, notices to be provided setting forth the provisions of this nondiscrimination clause.

(2) The contractor will, in all solicitations or advertisements for employees placed by or on behalf of the contractor, state that all qualified applicants will receive consideration for employment without regard to race, color, religion, sex, sexual orientation, gender identity, or national origin.

(2) The contractor will not discharge or in any other manner discriminate against any employee or applicant for employment because such employee or applicant has inquired about, discussed, or disclosed the compensation of the employee or applicant or another employee or applicant. This provision shall not apply to instances in which an employee who has access to the compensation information of other employees or applicants as a part of such employee's essential job functions discloses the compensation of such other employees or applicants to individuals who do not otherwise have access to such information, unless such disclosure is in response to a formal complaint or charge, in furtherance of an investigation, proceeding, hearing, or action, including an investigation conducted by the employer, or is consistent with the contractor's legal duty to furnish information.

(3) The contractor will send to each labor union or representative of workers with which he has a collective bargaining agreement or other contract or understanding, a notice to be provided advising the said labor union or workers' representatives of the contractor's commitments under this section, and shall post copies of the notice in conspicuous places available to employees and applicants for employment.

(4) The contractor will comply with all provisions of Executive Order 11246 of September 24, 1965, and of the rules, regulations, and relevant orders of the Secretary of Labor.

(5) The contractor will furnish all information and reports required by Executive Order 11246 of September 24, 1965, and by rules, regulations, and orders of the Secretary of Labor, or pursuant thereto, and will permit access to his books, records, and accounts by the administering agency and the Secretary of Labor for purposes of investigation to ascertain compliance with such rules, regulations, and orders.

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(6) In the event of the contractor's noncompliance with the nondiscrimination clauses of this contract or with any of the said rules, regulations, or orders, this contract may be canceled, terminated, or suspended in whole or in part and the contractor may be declared ineligible for further Government contracts or federally assisted construction contracts in accordance with procedures authorized in Executive Order 11246 of September 24, 1965, and such other sanctions may be imposed and remedies invoked as provided in Executive Order 11246 of September 24, 1965, or by rule, regulation, or order of the Secretary of Labor, or as otherwise provided by law. (8) The contractor will include the portion of the sentence immediately preceding paragraph (1) and the provisions of paragraphs (1) through

(7) in every subcontract or purchase order unless exempted by rules, regulations, or orders of the Secretary of Labor issued pursuant to section 204 of Executive Order 11246 of September 24, 1965, so that such provisions will be binding upon each subcontractor or vendor. The contractor will take such action with respect to any subcontract or purchase order as the administering agency may direct as a means of enforcing such provisions, including sanctions for noncompliance: Provided, however, that in the event a contractor becomes involved in, or is threatened with, litigation with a subcontractor or vendor as a result of such direction by the administering agency, the contractor may request the United States to enter into such litigation to protect the interests of the United States.

The applicant further agrees that it will be bound by the above equal opportunity clause with respect to its own employment practices when it participates in federally assisted construction work: Provided, That if the applicant so participating is a State or local government, the above equal opportunity clause is not applicable to any agency, instrumentality or subdivision of such government which does not participate in work on or under the contract.

The applicant agrees that it will assist and cooperate actively with the administering agency and the Secretary of Labor in obtaining the compliance of contractors and subcontractors with the equal opportunity clause and the rules, regulations, and relevant orders of the Secretary of Labor, that it will furnish the administering agency and the Secretary of Labor such information as they may require for the supervision of such compliance, and that it will otherwise assist the administering agency in the discharge of the agency's primary responsibility for securing compliance.

The applicant further agrees that it will refrain from entering into any contract or contract modification subject to Executive Order 11246 of September 24, 1965, with a contractor debarred from, or who has not demonstrated eligibility for, Government contracts and federally assisted construction contracts pursuant to the Executive Order and will carry out such sanctions and penalties for violation of the equal opportunity clause as may be imposed upon contractors and subcontractors by the administering agency or the Secretary of Labor pursuant to Part II, Subpart D of the Executive Order. In addition, the applicant agrees that if it fails or refuses to comply with these undertakings, the administering agency may take any or all of the following actions: Cancel, terminate, or suspend in whole or in part this grant (contract, loan, insurance, guarantee); refrain from extending any further assistance to the applicant under the program with respect to which the failure or refund occurred until satisfactory assurance of future compliance has been received from such applicant; and refer the case to the Department of Justice for appropriate legal proceedings.

2. Contractor shall comply with 40 U.S.C. §§ 3702 and 3704, as supplemented by Department of Labor regulations at 29 C.F.R. Part 5. See 2 C.F.R. Part 200, Appendix II(E) for all contract awarded by the non-Federal entity in excess of \$100,000 that involve the employment of mechanics or laborers. Contractor is required to compute the wages of every mechanic and laborer on the basis of a standard work week of 40 hours.

(1) Overtime requirements. No contractor or subcontractor contracting for any part of the contract work which may require or involve the employment of laborers or mechanics shall require or permit any such laborer or

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mechanic in any workweek in which he or she is employed on such work to work in excess of forty hours in such workweek unless such laborer or mechanic receives compensation at a rate not less than one and one-half times the basic rate of pay for all hours worked in excess of forty hours in such workweek.

(2) Violation; liability for unpaid wages; liquidated damages. In the event of any violation of the clause set forth in paragraph (b)(1) of this section the contractor and any subcontractor responsible therefore shall be liable for the unpaid wages. In addition, such contractor and subcontractor shall be liable to the United States (in the case of work done under contract for the District of Columbia or a territory, to such District or to such territory), for liquidated damages. Such liquidated damages shall be computed with respect to each individual laborer or mechanic, including watchmen and guards, employed in violation of the clause set forth in paragraph (b)(1) of this section, in the t \$27 for each calendar day on which such individual was required or permitted to work in excess of the standard workweek of forty hours without payment of the overtime wages required by the clause set forth in paragraph (b)(1) of this section.

(3) Withholding for unpaid wages and liquidated damages. The (write in the name of the Federal agency or the loan or grant recipient) shall upon its own action or upon written request of an authorized representative of the Department of Labor withhold or cause to be withheld, from any moneys payable on account of work performed by the contractor or subcontractor under any such contract or any other Federal contract with the same prime contractor, or any other federallyassisted contract subject to the Contract Work Hours and Safety Standards Act, which is held by the same prime contractor, such sums as may be determined to be necessary to satisfy any liabilities of such contractor or subcontractor for unpaid wages and liquidated damages as provided in the clause set forth in paragraph (b)(2) of this section.

(4) Subcontracts. The contractor or subcontractor shall insert in any subcontracts the clauses set forth in paragraph (b)(1) through (4) of this section and also a clause requiring the subcontractors to include these clauses in any lower tier subcontracts. The prime contractor shall be responsible for compliance by any subcontractor or lower tier subcontractor with the clauses set forth in paragraphs (b)(1) through (4) of this section.

3. Contractor shall comply with the Clean Air Act (42 U.S.C. §§ 7401-7671q.) and the Federal Water Pollution Control Act (33 U.S.C. §§ 1251-1387).

a. Clean Air Act

(1) The contractor agrees to comply with all applicable standards, orders or regulations issued pursuant to the Clean Air Act, as amended, 42 U.S.C. § 7401 et seq

(2) The contractor agrees to report each violation to the (name of subrecipient entering into the contract) and understands and agrees that the (name of the subrecipient entering into the contract) will, in turn, report each violation as required to assure notification to Treasury, and the appropriate Environmental Protection Agency Regional Office.

(3) The contractor agrees to include these requirements in each subcontract exceeding \$150,000

b. Federal Water Pollution Control Act

(1) The contractor agrees to comply with all applicable standards, orders, or regulations issued pursuant to the Federal Water Pollution Control Act, as amended, 33 U.S.C. 1251 et seq.

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- (2) The contractor agrees to report each violation to the (name of the subrecipient entering into the contract) and understands and agrees that the (name of the subrecipient entering into the contract) will, in turn, report each violation as required to assure notification to the Treasury, and the appropriate Environmental Protection Agency Regional Office.
- (3) The contractor agrees to include these requirements in each subcontract exceeding \$150,000
4. The contractor agrees to comply with the following suspension and debarment clauses,
- 1) This contract is a covered transaction for purposes of 2 C.F.R. pt. 180 and 2 C.F.R. pt. 3000. As such, the contractor is required to verify that none of the contractor's principals (defined at 2 C.F.R. § 180.995) or its affiliates (defined at 2 C.F.R. § 180.905) are excluded (defined at 2 C.F.R. § 180.940) or disqualified (defined at 2 C.F.R. § 180.935).
- (2) The contractor must comply with 2 C.F.R. pt. 180, subpart C and 2 C.F.R. pt. 3000, subpart C, and must include a requirement to comply with these regulations in any lower tier covered transaction it enters into.
- (3) This certification is a material representation of fact relied upon by (insert name of recipient/subrecipient/applicant). If it is later determined that the contractor did not comply with 2 C.F.R. pt. 180, subpart C and 2 C.F.R. pt. 3000, subpart C, in addition to remedies available to (insert name of recipient/subrecipient/applicant), the Federal Government may pursue available remedies, including but not limited to suspension and/or debarment.
- (4) The bidder or proposer agrees to comply with the requirements of 2 C.F.R. pt. 180, subpart C and 2 C.F.R. pt. 3000, subpart C while this offer is valid and throughout the period of any contract that may arise from this offer. The bidder or proposer further agrees to include a provision requiring such compliance in its lower tier covered transactions.
5. Contractor shall comply with the Byrd Anti-Lobbying Amendment (31 U.S.C. § 1352).
- (1) Contractors who apply or bid for an award of \$100,000 or more shall file the required certification. Each tier certifies to the tier above that it will not and has not used Federal appropriated funds to pay any person or organization for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, officer or employee of Congress, or an employee of a Member of Congress in connection with obtaining any Federal contract, grant, or any other award covered by 31 U.S.C. § 1352. Each tier shall also disclose any lobbying with non-Federal funds that takes place in connection with obtaining any Federal award. Such disclosures are forwarded from tier to tier up to the recipient who in turn will forward the certification(s) to the awarding agency
- (2) The contractor agrees to include these requirements in each subcontract exceeding \$100,000.
6. Contractor shall comply with section 6002 of the Solid Waste Disposal Act, as amended by the Resource Conservation Recovery Act.
- (1) In the performance of this contract, the Contractor shall make maximum use of products containing recovered materials that are EPA-designated items unless the product cannot be acquired competitively within a timeframe providing for compliance with the contract performance schedule; meeting contract performance requirements; or at a reasonable price. Information about this requirement, along with the list of EPA-

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designated items, is available at EPA's Comprehensive Procurement Guidelines webpage. The Contractor also agrees to comply with all other applicable requirements of Section 6002 of the Solid Waste Disposal Act.

7. Contractor shall comply with the Domestic Preference for Procurements as stated below.

(1) As appropriate, and to the extent consistent with law, the contractor should, to the greatest extent practicable, provide a preference for the purchase, acquisition, or use of goods, products, or materials produced in the United States. This includes, but is not limited to iron, aluminum, steel, cement, and other manufactured products.

For purposes of this clause:

Produced in the United States means, for iron and steel products, that all manufacturing processes, from the initial melting stage through the application of coatings, occurred in the United States. Manufactured products mean items and construction materials composed in whole or in part of non-ferrous metals such as aluminum; plastics and polymer-based products such as polyvinyl chloride pipe; aggregates such as concrete; glass, including optical fiber; and lumber.

8. Contractor shall comply with the access to records requirements as stated below.

(1) The Contractor agrees to provide (insert name of state agency or local or Indian tribal government), (insert name of recipient), Treasury, the Comptroller General of the United States, or any of their authorized representatives access to any books, documents, papers, and records of the Contractor which are directly pertinent to this contract for the purposes of making audits, examinations, excerpts, and transcriptions.

(2) The Contractor agrees to permit any of the foregoing parties to reproduce by any means whatsoever or to copy excerpts and transcriptions as reasonably needed.

(3) The Contractor agrees to provide the Treasury or authorized representatives access to construction or other work sites pertaining to the work being completed under the contract.

9. This is an acknowledgement that Treasury ARP SLFRF financial assistance will be used to fund all or a portion of the contract. The contractor will comply with all applicable Federal law, regulations, executive orders, Treasury policies, procedures, and directives

10. The Contractor acknowledges that 31 U.S.C. Chap. 38 (Administrative Remedies for False Claims and Statements) applies to the Contractor's actions pertaining to this contract.

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END OF SECTION 00 7300

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**SECTION 01 0000
GENERAL REQUIREMENTS**

PART 1 -GENERAL

1.1 SUMMARY

1.2 GENERAL REQUIREMENTS

- A. General: The Contractor shall have full use of premises for construction operations, including use of project site, during construction. Contractor's use of premises is limited only by Owner's right to perform work or to retain other contractors on portions of Project and conditions of any easement or right-of-way occupancy permits.
- B. Prior to commencement of Work, the Contractor shall review the construction site with the Owner's representative to make permanent record of such existing damage as cracks, malfunctioning utility equipment and fixtures, or other similar damage. This record shall serve as a basis for determination of subsequent damage to the structures and adjacent areas due to Contractor's operations. Any damage to these structures and adjacent areas not noted in original review record shall be reported immediately to Owner. Permanent record shall include photographs and/or video graphic recording.
- C. Smoking and Fire Precautions: No smoking, fire, or use of any fire- or explosion- producing tools or equipment will be permitted on the premises or at any locations where such may endanger said premises or the current operations thereon.
- D. Manufacturers Qualifications: The manufacturers of all materials and equipment used must be approved by the Engineer and regularly engaged in the manufacture of the particular material or equipment for the use and service to which it will be subjected.
- E. Compliance with state and local laws: Comply will all applicable requirements of state and local laws and ordinances to the extent that such requirements do not conflict with federal laws or regulations.
- F. Protection of public and private property: The Contractor shall be responsible for preservation of and shall take special care in working areas to protect public and private property. The Contractor shall replace or repair at his own expense any damaged water pipes, power and communication lines, or other public utilities, roads, curbs, gutters, sidewalks, drain pipes, drainage ditches, all properties and fixtures (both permanent and temporary), and all plantings, including grass or sod on the site of the work. Leave the site in original or better condition after all cleanup work has been done.
- G. Markers: Preserve all surveyed and privately owned markers and monuments; do not remove or disturb any such markers without prior approval from the Owner of the marker. Any removal and replacement of such markers shall be at the expense of the Contractor.
- H. Pavement repair and/or replacement: Whenever existing asphalt is removed, backfill same and restore traffic over the disturbed area as quickly as possible by constructing a temporary eight-inch thick surface of Class A, Grade D crushed stone. Add material and otherwise maintain such surface until the permanent pavement is restored by the Contractor or until the work is accepted.
- I. Department of Transportation Permits: The Owner will secure any permits and provide bond as required by any federal, state, and local transportation department for the installation of permanent facilities on highway rights-of-way. All such work shall be coordinated with and be subject to the approval of said transportation department and Engineer. The Contractor shall be responsible for permits and bonding for Work not provided for on the Drawings.
- J. Approved Chemicals: All chemicals used during project construction or furnished for project operation, whether herbicide, pesticide, disinfectant, polymer, reactant, or of other classification, must show approval

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of either EPA or USDA. The use of all such chemicals and the disposal of residues shall be in strict conformance with manufacturer's instructions.

- K. Installation, Testing and Guarantee: Install all materials and equipment exactly in accordance with the manufacturer's recommendations. The completely installed system shall be guaranteed against any and all defects of manufacture, materials, workmanship, or installation for a period of one year from the date of Substantial Completion.
- L. Drawings of Record: Provide and keep up-to-date a complete record set of drawings, which shall be corrected daily to show every change. Keep this set of prints at the job site and use only as a record set. This shall not be construed as authorization for the Contractor to make changes in the approved layout without definite instructions in each case. Turn the set over to the Owner upon completion of the project.
- M. Preservation of Existing Vegetation: Take reasonable care during construction to avoid damage to vegetation. Where the area to be excavated is occupied by trees, brush, or other uncultivated vegetable growth, clear such growth from the area, and dispose of it in a manner satisfactory to the Owner. Leave undisturbed any trees, cultivated shrubs, flowers, etc., situated within public rights-of-way and/or easements through private property but not located directly within excavation limits. Transplant small ornamental trees, cultivated shrubs, flowers, etc., located directly within excavation limits so they may be replaced during property restoration operations. Do not remove or disturb any tree larger than six inches (6") in diameter without the permission of the Owner. Take special precautions (including the provision of barricades and the temporary tying back of shrubbery and tree branches) for the protection and preservation of such objects throughout all stages of construction; the Contractor will be held liable for any damage that may result to said objects from excavation or construction operations. Trim any limbs or branches of trees broken during construction operations with a clean cut and paint with an approved tree pruning compound. Treat tree trunks receiving damage from equipment with an approved tree dressing.
- N. Existing Utilities: The Contractor is to notify Owner of all underground utilities no less than two days in advance of proposed utility interruption before beginning construction in the area. The Contractor is responsible for locating all existing utilities prior to construction and shall carefully protect from damage all utilities in the vicinity of the work at all times. The Contractor shall be responsible for repairing any utilities that were properly located and marked. If it is necessary to repair, remove, and/or replace any such utility in order to complete the work properly, do so in compliance with the rules, regulations, and approval of the particular utility involved. Any such work shall be considered incidental to the construction or repairs of utility lines, and no additional payment will be allowed therefore. Existing utilities shall remain in service at all times during construction. Contractor shall provide any temporary piping necessary to maintain utility service to existing customers.
- O. Contractor shall comply with the requirements of the Manual on Uniform Traffic Control Devices published by the U.S. Department of Transportation Federal Highway Administration in supplying adequate signage, flagging, personnel, etc. for the entire project. The Contractor shall be responsible for the placement and removal of all signage.
- P. The Contractor shall maintain an acceptable flow of traffic through construction areas. If a roadway must be closed in order to construct the Work, the Contractor shall notify local law enforcement, 911 call center, local school superintendent, and U.S. Postal Service, at a minimum, at least two days prior to roadway closure.
- Q. Work in Right-of-Ways:
 - 1. The Contractor shall notify the authorities having jurisdiction prior to entering and working in right-of-ways and shall be responsible for all damages resulting from said Work and for satisfying the requirements of said authorities.
 - 2. The Contractor shall maintain a suitable and safe condition throughout the right-of-way affected by the Work and provide detours as necessary for public and private traffic.
 - 3. Materials excavated in right-of-ways shall be hauled to a disposal site immediately and shall not be stockpiled in right-of-way.

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- R. Inspection of Work: The Contractor shall provide full access to the project site at all times for inspection and observation of Work by the Owner, Engineer, and agents of any local, state, or federal agency having jurisdiction.
- S. Flood Insurance: The Contractor is required to carry flood insurance for Work which is located in designated flood hazard areas unless insurance is not available.

PART 2 -PRODUCTS (NOT USED)

PART 3 -EXECUTION (NOT USED)

3.1 OPERATION OF EXISTING UTILITIES

- A. The Work shall be performed so as to cause minimum interference or interruption with the normal operation of the existing utilities. The Contractor shall plan and conduct construction sequencing operations to avoid disturbing existing utilities and equipment, except as may be provided or approved by the Engineer.

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END OF SECTION 01 0000

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**SECTION 01 1000
SUMMARY**

PART 1 GENERAL

1.1 SUMMARY

- A. Project Description: The three projects generally consist of the following.
1. Mayfield Regional Detention – Furnishing of all materials, equipment, and labor for installation of approximately 300 L.F. of gabion baskets, removal and installation of approximately 131 L.F. of 8" diameter gravity sewer and 1 sanitary sewer manhole, installation of approximately 34 L.F. of 36" RCP culvert and 2 headwalls, installation of approximately 13,200 sq. ft. of permeable sidewalks, and installation of approximately 135 trees and 411 shrubs. The project also includes all erosion control, excavation, grading, hauling, disposal, traffic control, and testing necessary to complete the work.
 2. Regional Park Dredging and Stabilization – Furnishing of all materials, equipment, and labor for installation of approximately 400 L.F. of gabion baskets and dredging of approximately 4000 cu. yd. of sediment. The project also includes all erosion control, excavation, grading, hauling, disposal, traffic control, and testing necessary to complete the work.
 3. Cook Drive Pond Improvements – Furnishing of all materials, equipment, and labor for removal of approximately 10 L.F. of 18" RCP, removal of existing outlet control structure and installation of new outlet control structure. The project also includes all erosion control, excavation, grading, hauling, disposal, traffic control, and testing necessary to complete the work.
- B. Project Location: As shown on the drawings.
- C. Owner: City of Athens, 815 N Jackson St, Athens, TN 37303
- D. This information is furnished by the Owner for the Contractor's use. Neither the Engineer or Owner warrant or take responsibility for the information to be correct, complete, or otherwise guaranteed. The Contractor shall hold harmless the Engineer and the Owner for inaccuracies.

PART 2 PRODUCTS [NOT USED]

PART 3 EXECUTION [NOT USED]

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END OF SECTION 01 1000

**SECTION 01 2000
PRICE AND PAYMENT PROCEDURES**

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Procedures for preparation and submittal of applications for progress payments.
- B. Procedures for preparation and submittal of application for final payment.

1.2 RELATED REQUIREMENTS

- A. Section 00 5000 - Contracting Forms and Supplements: Forms to be used.
- B. Section 00 5200 - Agreement Form: Contract Sum, retainages, payment period, monetary values of unit prices.
- C. Section 00 7200 - General Conditions: Additional requirements for progress payments, final payment, changes in the Work.
- D. Section 00 7300 - Supplementary Conditions: Percentage allowances for Contractor's overhead and profit.
- E. Section 01 7800 - Closeout Submittals: Project record documents.

1.3 SCHEDULE OF VALUES

- A. Use Schedule of Values Form: EJCDC C-620, edition stipulated in the Agreement.
- B. An electronic media printout including equivalent information will be considered in lieu of standard form specified; submit draft to Architect/Engineer for approval.
- C. Forms filled out by hand will not be accepted.

1.4 APPLICATIONS FOR PROGRESS PAYMENTS

- A. Payment Period: Submit at intervals stipulated in the Agreement.
- B. Electronic media printout including equivalent information will be considered in lieu of standard form specified; submit sample to Architect for approval.
- C. Forms filled out by hand will not be accepted.
- D. For each item, provide a column for listing each of the following:
 - 1. Item Number.
 - 2. Description of work.
 - 3. Scheduled Values.
 - 4. Previous Applications.
 - 5. Work in Place and Stored Materials under this Application.
 - 6. Authorized Change Orders.
 - 7. Total Completed and Stored to Date of Application.
 - 8. Percentage of Completion.
 - 9. Balance to Finish.
 - 10. Retainage.
- E. Execute certification by signature of authorized officer.

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- F. Use data from approved Schedule of Values. Provide dollar value in each column for each line item for portion of work performed and for stored products.
- G. List each authorized Change Order as a separate line item, listing Change Order number and dollar amount as for an original item of work.
- H. Submit one electronic and three hard-copies of each Application for Payment.
- I. Include the following with the application:
 - 1. Transmittal letter as specified for submittals in Section 01 3000.
 - 2. Construction progress schedule, revised and current as specified in Section 01 3000.
 - 3. Current construction photographs specified in Section 01 3000.

1.5 APPLICATION FOR FINAL PAYMENT

- A. Prepare Application for Final Payment as specified for progress payments, identifying total adjusted Contract Sum, previous payments, and sum remaining due.
- B. Application for Final Payment will not be considered until the following have been accomplished:
 - 1. All closeout procedures specified in Section 01 7000.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

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END OF SECTION 01 2000

**SECTION 01 2219
MEASUREMENT AND PAYMENT**

PART 1 GENERAL

1.1 SUMMARY

- A. This Section includes administrative and procedural requirements for measurement and payment.
- B. Measurement for payment on a unit price basis shall be as described herein. Payment for each item installed shall be made according to the unit price bid, as listed on the Bid Form. Only those items appearing on the Bid Form will be considered for payment on a unit price basis.
- C. For work items included in the technical specifications and not listed herein, such work shall be considered part of or incidental to its related work.
- D. Pay items for the work for which contract payment will be made are listed on the Bid Form and briefly described herein. All costs for items of work, which are not specifically mentioned to be included in a particular lump sum or unit price payment item, shall be considered incidental to the pay items and the cost of such shall be included in the listed item most closely associated with the work involved. The price and payment made for each item listed shall constitute full compensation for furnishing all labor, materials, machinery, equipment, tools, apparatus, service, and other necessary supplies and performing any associated Contractor quality control, environmental protection, meeting safety requirements, tests and reports, and for performing all work required for which separate payment is not otherwise provided.
- E. When actual field conditions differ from assumed design conditions and result in a reduction in materials, equipment, and appurtenances to be installed, a negative adjustment will be made to the Contract. If items are provided on the bid form these items will be used for adjustment, otherwise, the Contractor shall provide costs for a Change Order.
- F. Final payment quantities shall be determined from the record drawings. The record drawing lengths, dimensions, quantities, etc. shall be determined by a survey after the completion of all required work. Said survey shall conform to Section 01 7839 of these Specifications. The precision of final payment quantities shall match the precision shown for that item in the Bid.
- G. The Contractor must furnish all necessary labor, materials, machinery, equipment, tools, apparatus, service, and other necessary supplies and perform all work shown on the Drawings and/or described in the Specifications at the price listed on the Bid Form. The Work shall be complete-in-place and ready for operation.
- H. The Contractor must be thoroughly familiar with the terms and conditions of the Bidding Documents and with local conditions affecting the performance and costs of the Work at the place where the Work is to be completed and have fully inspected the site in all particulars informing himself fully regarding all conditions pertaining to the Work site.

1.2 ALLOWANCES

- A. General
 - 1. Testing Agency Allowance: The Contractor must include in the Bid Total all allowances stated in the Contract Documents. These allowances shall cover the net cost of the services provided by an independent testing agency approved by the Owner. The Contractor's handling costs, labor, overhead, profit and other expenses contemplated for the original allowance shall be included in the items to which they pertain and not in allowances.
 - 2. No payment will be made for nonproductive time on the part of testing personnel due to the Contractor's failure to properly coordinate testing activities with the work schedule or the Contractor's problems with maintaining equipment in good working condition. The Contractor must make all

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- necessary excavations and preparations and must supply any samples of materials necessary for conducting compaction, density, and other tests as required.
3. No payment shall be provided for services that fail to verify the required results.
- B. Should the net cost be more or less than the specified amount of the allowance, the Contract will be adjusted accordingly by change order. The amount of change order will not recognize any changes in handling costs at the site, labor, overhead, profit and other expenses caused by the adjustment to the allowance.
- C. Documentation
1. Submit copies of the invoices with each periodic payment request from the firm providing the services.
 2. Submit results of services provided which verify required results.
- D. Schedule of Cash Allowances
1. Soils Testing: Allow the amount provided in the Bid for the services of a geotechnical engineering firm and independent testing laboratory to verify soils conditions including trench excavation and backfill, pile bearing resistance and similar issues and for the testing of concrete cylinders for poured in place concrete.
 2. Concrete and Materials Testing: Allow the amount provided in the Bid for the services of a testing laboratory for the testing of materials to be furnished on the Project, e.g., reinforced concrete pipe.
 3. Construction Verification Surveying
 - a. Allow the amount provided in the Bid for construction surveying by an independent surveying firm, selected by the Owner, to perform horizontal and vertical alignment checks at the discretion of the Engineer.
 - b. This allowance is solely for the use of the Engineer for verification of the Contractor's reference points, centerlines and work performed. The presence of this cash allowance in no way relieves the Contractor of the responsibility of installing reference points, centerlines, temporary benchmarks or verifying that the work has been performed accurately.
 4. Additional Landscaping Not Shown on the Drawings: Allow the amount specified in the Bid for the provision of landscaping in addition to that shown on the Drawings, when directed by the Owner. If deemed necessary by the Owner, Contractor services for this item shall be requested in the form of a Change Order, as outlined in these Specifications.

1.3 SCHEDULE OF PAY ITEMS

- A. Section 01 5000 – Temporary Facilities and Controls: Mobilization of the Contractor onsite ready to begin construction per the Contract documents is a pay item. Where applicable, payment shall be made at the lump sum price listed on the Bid Form. The lump sum payment shall be made as a percentage based on site specific requirements of the project. Any demobilization or remobilization occurring during the duration of the Project will not qualify for payment.
1. 01 5639 – Tree and Plant Protection: Tree and Plant Protection is not a pay item. Payment for this work shall be incidental to the Work and considered as full compensation for this item, including all labor, materials, and equipment required to complete the item in accordance with the Bidding Documents.
 2. 01 5813 – Temporary Project Signage: Temporary Project Signage is not a pay item. Payment for this work shall be incidental to the Work and considered as full compensation for this item, including all labor, materials, and equipment required to complete the item in accordance with the Bidding Documents.
- B. Section 01 5533 – Traffic Control: Traffic Control is a pay item. Payment for traffic control along State, County, and City streets/roads shall be made as Lump Sum and considered as full compensation for this item including all labor, materials, and equipment required to complete the item in accordance with the Bidding Documents. All signage and control devices shall meet the requirements of the Manual on Uniform Traffic Control Devices (MUTCD) (current edition) and requirements.
- C. Section 03 3000 – Cast-in-Place Concrete: Cast-in-Place Concrete is not a pay item. Payment for this work shall be incidental to the Work and considered as full compensation for this item, including all labor, materials, and equipment required to complete the item in accordance with the Bidding Documents.

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1. Ribbon Curb: Ribbon Curb is a pay item. Payment for this work shall be as specified on the Bid Form and considered as full compensation for this item, including all labor, materials, and equipment required to complete the item in accordance with the Bidding Documents. Payment for Ribbon Curb will be at the unit price of linear feet of Ribbon Curb
- D. Section 31 0000 – Earthwork: Earthwork is a pay item. Payment for this work shall be made as Lump Sum and considered as full compensation for this item including all labor, materials, and equipment required to complete the item in accordance with the Bidding Documents. Earthwork will include all work associated with Grading, Excavation, Trenching and Backfilling, Fill, and Landscape Grading. No separate payment will be made for rock excavation.
 1. Dewatering: No separate payment will be made for dewatering required to accomplish the work. All costs of equipment, labor and materials required for dewatering shall be included in the price bid for the item to which it pertains.
 2. Backfilling: No separate payment will be made for backfilling or excavation, hauling and placement of borrow material. The cost of all such work and all costs incidental thereto shall be included in the unit price bid for the item to which the work pertains.
- E. Section 31 0519 – Geosynthetics for Earthwork. Geosynthetics for Earthwork is not a pay item. Payment for this work shall be bid as specified below:
 1. Geotextile Fabric: Payment for this work shall be as specified on the Bid Form and considered as full compensation for this item, including all labor, materials, and equipment required to complete the item in accordance with the Bidding Documents. Payment for Geotextile Fabric will be at the unit price of square yards.
- F. Section 31 1000 – Site Clearing and Demolition: Site Clearing and Demolition is not a pay item. Payment for this work shall be incidental to the Work and considered as full compensation for this item including all labor, materials, and equipment required to complete the item in accordance with the Bidding Documents. All earthwork related to site grading and utility installation shall be considered unclassified. No payment shall be made for areas where proper erosion control devices are not constructed and maintained. The cost of moving and reestablishing landscape features, including labor and materials, shall be included in the unit price bid for the item to which it pertains.
- G. Section 31 2316.26 – Rock Excavation: Rock excavation is not a pay item. Payment for this work shall be incidental to the Work and considered as full compensation for this item, including all labor, materials, and equipment required to complete the item in accordance with the Bidding Documents.
- H. Section 31 2319 – Dewatering: Dewatering is not a pay item. Payment for this work shall be incidental to the Work and considered as full compensation for this item, including all labor, materials, and equipment required to complete the item in accordance with the Bidding Documents.
 1. Filter Bag: Filter Bag is a pay item. Payment for this work shall be as specified on the Bid Form and considered as full compensation for this item, including labor, materials, and equipment required to complete the item in accordance with the Bidding Documents. Filter Bags shall be bid assuming a minimum bag size of 25 ft by 15 ft. All costs associated with stone, silt fence, and geotextile fabric shall be included in the bid for Filter Bags. Payment for Filter Bags will be at the unit price per each Filter Bag.
 2. Alternative Sediment Filtration Device: An alternative sediment filtration device may be specified on the Bid Form in lieu of Filter Bags. Item should be bid in accordance with Dewatering Device (Option 1) on sheet C902 of the Regional Park Dredging and Stabilization plan set. Payment for this work shall be as specified on the Bid Form and considered as full compensation for this item, including all labor, materials, and equipment required to complete the item in accordance with the Bidding Documents. All costs associated with stone, strawbales, silt fence, and geotextile fabric shall be included in the bid for Alternative Sediment Filtration Device. Payment for Alternative Sediment Filtration Device will be at the unit price per each device.
- I. Section 31 2500 – Erosion and Sediment Control is a pay item. Payment for this work shall be made as Lump Sum and considered as full compensation for this item including all labor, materials, equipment, installation, maintenance and repair of erosion control measures as shown in the Initial and Intermediate

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Erosion Control Phases of the Bidding Documents. This will include any relocation, replacement, or additional measures as required based on the Contractor's sequence of construction. This will also include inspections and completion of inspection reports as required by the City of Athens and TDEC.

- J. Section 31 3700 – Rip Rap: Rip Rap is a pay item. Payment for this work shall be as specified on the Bid Form and considered as full compensation for this item, including all labor, materials, and equipment required to complete the item in accordance with the Bidding Documents. Payment for Rip Rap will be at the unit price of cubic yards of Rip Rap.
- K. Section 32 0190 – Operation and Maintenance of Planting is not a pay item. Payment for this work shall be incidental to the Work and considered as full compensation for this item, including all labor, materials, and equipment required to complete the item in accordance with the Bidding Documents.
- L. Section 32 1120 – Subbase and Aggregate Base Courses: Aggregate Base Course is a pay item. Payment for this work shall be as specified on the Bid Form and considered as full compensation for this item, including all labor, materials, and equipment required to complete the item in accordance with the Bidding Documents. Payment for Aggregate Base Course will be at the unit price of cubic yards of Aggregate Base Course.
- M. Section 32 1623 – Sidewalks: Concrete Sidewalk is a pay item. Payment for this work shall be as specified on the Bid Form and considered as full compensation for this item, including all labor, materials, and equipment required to complete the item in accordance with the Bidding Documents. Payment for Concrete Sidewalk will be at the unit price of square feet of Concrete Sidewalk.
 - 1. ADA Tiles: ADA Tiles are a pay item. Payment for this work shall be as specified on the Bid Form and considered as full compensation for this item, including all labor, materials, and equipment required to complete the item in accordance with the Bidding Documents. Payment for ADA Tiles will be at the unit price per square foot of ADA Tiles.
- N. Section 32 9119 – Landscape Grading is not a pay item. Payment for this work shall be incidental to the Work and considered as full compensation for this item, including all labor, materials, and equipment required to complete the item in accordance with the Bidding Documents.
- O. Section 32 9219 – Seeding: Seeding is a pay item. Payment for this work shall be as specified on the Bid Form and considered as full compensation for this item, including all labor, materials, and equipment required to complete the item in accordance with the Bidding Documents. All costs associated with seeding, fertilizing, mulching as well as temporary measures, shall be included in the bid price for seeding. Payment for seeding will be at the unit price of acres of Seeding. No payment will be made for any seeding which does not produce a satisfactory and acceptable growth of grass.
- P. Section 32 9223 - Sodding: Sodding is a pay item. Payment for this work shall be as specified on the Bid Form and considered as full compensation for this item, including all labor, materials, and equipment required to complete the item in accordance with the Bidding Documents. All costs associated with fertilizing and maintaining sod after installation shall be included in the bid price for sodding. Payment for sodding will be at the unit price of square yards of Sodding. No payment will be made for any sodding which does not produce a satisfactory and acceptable growth of grass.
- Q. Section 32 9300 – Plants is not a pay item. Payment for this work shall be bid as specified below:
 - 1. Landscaping: Landscaping is a pay item. Payment for this work shall be made as Lump Sum and considered as full compensation for this item including all labor, materials, and equipment required to complete the item in accordance with the Bidding Documents. All costs associated with maintaining landscaping after installation should be included in the bid price for landscaping.
- R. Section 33 3113 – Sanitary Sewers (Gravity): Sanitary sewers (gravity) is not a pay item. Payment for this work shall be as specified below:
 - 1. " Sanitary Sewer Pipe: " Sanitary Sewer Pipe is a pay item. Payment for this work shall be as specified on the Bid Form and considered as full compensation for this item, including all labor,

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- materials, and equipment required to complete the item in accordance with the Bidding Documents. Payment for _" Sanitary Sewer Pipe will be at the unit price per linear foot of sewer.
2. Bedding and Haunching
- The unit price bid for pipe for gravity sewer shall include excavation of the trench to the depth below the pipe necessary to provide specified bedding and to lay the sewer to grade. Measurements for payment will be made only to the pipe invert.
 - No additional payment will be made for additional trench depth.
 - No separate payment will be made for material used to provide specified bedding. The cost of all bedding materials shall be included in the unit price bid for the item to which it relates
 - No additional payment will be made for improved bedding required to compensate for over excavation of the trench.
- S. Section 33 3913 – Manholes: Manhole is a pay item. Payment for this work shall be as specified on the Bid Form and considered as full compensation for this item, including all labor, materials, and equipment required to complete the item in accordance with the Bidding Documents. Payment for Manhole will be at the unit price per each Manhole.
- T. Section 33 4000 – Storm Drainage: Storm drainage is not a pay item. Payment for this work shall be bid as specified below:
- Storm Pipe Removal: Storm pipe removal is a pay item. Payment for this work shall be as specified on the Bid Form and considered as full compensation for this item, including all labor, materials, and equipment required to complete the item in accordance with the Bidding Documents. Payment for Storm Pipe Removal will be at the unit price per linear foot of Storm Pipe Removal.
 - Outlet Structure: Outlet Structure is a pay item. Payment for this work shall be as specified on the Bid Form and considered as full compensation for the furnishing and installation of the Cook Drive Pond outlet structure, including all labor, materials and equipment required to complete the item in accordance with the Bidding Documents. Payment for Outlet Structure will be at the unit price per each Outlet Structure.
 - Concrete: Concrete is a pay item. Payment for this work shall be as specified on the Bid Form and considered as full compensation for this item, including all labor, materials, and equipment required to create a cast-in-place base for the Cook Drive Pond outlet structure in accordance with the bidding documents. Payment for Concrete will be at the unit price per cubic yard of Concrete.
 - First Flush Trash Rack: First Flush Trash Rack is a pay item. Payment for this work shall be as specified on the Bid Form and considered as full compensation for furnishing and installation of the Cook Drive Pond Outlet Structure First Flush Trash Rack, including all labor, materials and equipment required to complete the item in accordance with the Bidding documents. All costs associated with stone and geotextile fabric shall be included in the bid for First Flush Trash Rack. Payment for First Flush Trash Rack will be at the unit price per each rack.
- U. Section 33 4213 – Stormwater Culverts: Stormwater culverts is not a pay item. Payment for this work shall be bid as specified below:
- RCP Pipe Culvert, _": RCP Pipe Culvert, _" is a pay item. Payment for this work shall be as specified on the Bid Form and considered as full compensation for this item, including all labor, materials, and equipment required to complete the item in accordance with the Bidding Documents. Payment for RCP Pipe Culvert, _" will be at the unit price per linear foot of RCP Pipe.
 - Concrete Headwall, _": Concrete Headwall, _" is a pay item. Payment for this work shall be as specified on the Bid Form and considered as full compensation for this item, including all labor, materials, and equipment required to complete the item in accordance with the Bidding Documents. All costs associated with concrete, steel bar reinforcement, stone, and incidentals shall be included in the bid for Concrete Headwall, _". Payment for Concrete Headwall, _" will be at the unit price per each Concrete Headwall.
- V. Section 35 2421 - Mechanical Dredging: Mechanical Dredging is a pay item. Payment for this work shall be as specified on the Bid Form and considered as full compensation for this item, including all labor, materials, and equipment required to complete the item in accordance with the Bidding Documents. All costs associated with dewatering, storage, hauling, and disposal of dredged sediment shall be included in the bid

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price for Mechanical Dredging. Payment for Mechanical Dredging will be at the unit price per cubic yard of dredged sediment.

- W. Vegetated Gabions: Vegetated Gabions is a pay item. Payment for this work shall be as specified on the Bid Form and considered as full compensation for this item, including labor, materials, and equipment required to complete the item in accordance with the Bidding Documents. All costs associated with wire gabion basket, rock, live branch cuttings, and vegetation shall be included in the bid for Vegetated Gabions. Payment for Vegetated Gabions will be at the unit price per cubic yard of Vegetated Gabions' basket capacity.
1. Compacted Backfill: Compacted Backfill is a pay item. Payment for this work shall be as specified on the Bid Form and considered as full compensation for this item, including labor, materials, and equipment required to complete the item in accordance with the Bidding Documents. Payment for Compacted Backfill will be at the unit price per cubic yards of Compacted Backfill.
- X. Permeable Pavers: Permeable Pavers is a pay item. Payment for this work shall be as specified on the Bid Form and considered as full compensation for this item, including labor, materials, and equipment required to complete the item in accordance with the Bidding Documents. All costs associated with pavers, stone, sand, and filter fabric shall be included in the bid for Permeable Pavers. Payment for Permeable Pavers will be at the unit price per square foot of Permeable Pavers.
- Y. Permatrack Overlook: Permatrack Overlook is a pay item. Payment for this work shall be made as Lump Sum and considered as full compensation for this item including all labor, materials, and equipment required to complete the item in accordance with the Bidding Documents.
- Z. Geotechnical Investigation: Geotechnical Investigation is a pay item. Payment for this work shall be made as a Lump Sum and considered as full compensation for this item including all labor, materials, and equipment required to complete the item in accordance with the Bidding Documents. Requirements of Geotechnical Investigation are as required to determine the adequacy of the substrate below the location of the 20'x40' Pavilion (By Owner) for the foundation. Requirements of the Geotechnical Investigation shall be coordinated with the owner prior to conducting investigation.

PART 1 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

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END OF SECTION 01 2219

**SECTION 01 2600
CONTRACT MODIFICATION PROCEDURES**

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Minor changes in the Work.
 - 2. Change Orders.
 - 3. Amendments.
- B. Related Requirements:
 - 1. Section 01 2500: Substitution requests made after Contract award.
- C. The Architect/Engineer shall not be responsible for changes from requirements in the Contract Documents directed by the Owner or made by the Contractor without the Architect's/Engineer's approval, including product substitutions.

1.2 MINOR CHANGES IN THE WORK

- A. Architect/Engineer will issue a formal narrative authorizing minor changes in the Work that do not involve adjustment to Contract Sum or Contract Time, by use of an Amendment.

1.3 PROPOSAL REQUESTS

- A. Owner-Initiated Proposal Requests: Architect/Engineer will issue detailed description of proposed changes in the Work that may require adjustment to Contract Sum or Contract Time.
- B. Work Change Proposal Requests issued by Architect/Engineer are not instructions either to stop work in progress or to execute the proposed change.
- C. Within time specified in Proposal Request after receipt of Proposal Request, submit quotation estimating cost adjustments to Contract Sum and Contract Time necessary to execute the change.
 - 1. Include list of quantities of products required or eliminated and unit costs, with total amount of purchases and credits to be made. If requested, supply survey data to substantiate quantities.
 - a. Indicate applicable taxes, delivery charges, equipment rental, and amounts of trade discounts.
 - b. Include costs of labor and supervision directly attributable to the change.
 - c. Include an updated Contractor's construction schedule that indicates the effect of the change, including, but not limited to, changes in activity duration, start and finish times, and activity relationship. Use available total float before requesting an extension of the Contract Time.
- D. Contractor-Initiated Proposals: If latent or changed conditions require modifications to the Contract, Contractor may initiate a claim by submitting a request for a change to Architect/Engineer.
- E. Submit proposed change request within 15 days after becoming aware of unforeseen conditions.
- F. Include statement outlining reasons for the change and effect of the change on the Work. Provide complete description of the proposed change. Indicate effect of proposed change on the Contract Sum and the Contract Time.
- G. Include list of quantities of products required or eliminated and unit costs, with total amount of purchases and credits to be made. If requested, supply survey data to substantiate quantities.
- H. Indicate applicable taxes, delivery charges, equipment rental, and amounts of trade discounts.

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- I. Include costs of labor and supervision directly attributable to the change.
- J. Include updated Contractor's construction schedule that indicates effect of the change, including changes in activity duration, start and finish times, and activity relationship. Use available total float before requesting an extension of the Contract Time.
- K. Comply with requirements in Section 01 2500 if proposed change requires Substitutions of products or systems from those specified.
- L. Proposal Request Form: AIA Document G709 for Proposal Requests.

1.4 CHANGE ORDER PROCEDURES

- A. On Owner's approval of a Work Changes Proposal Request, Architect/Engineer will issue a Change Order for signatures of Owner and Contractor on AIA Document G701.

1.5 AMENDMENT

- A. Amendment: Architect/Engineer will issue an Amendment instructing Contractor to proceed with a change in the Work, for subsequent inclusion in a Change Order.
- B. The Amendment contains a complete description of change in the Work. It does not designate the method to be followed to determine change in the Contract Sum or the Contract Time.
- C. Documentation: Maintain detailed records on a time and material basis of work required by the Amendment, if required by the Owner.
- D. After completion of change, submit an itemized account and supporting data necessary to substantiate cost and time adjustments to the Contract.

1.6 PART 2 PRODUCTS (NOT USED)

1.7 PART 3 EXECUTION (NOT USED)

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END OF SECTION 01 2600

**SECTION 01 3100
PROJECT MANAGEMENT AND COORDINATION**

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Section includes administrative provisions for coordinating construction operations on Project including, but not limited to, the following:
 - 1. General coordination procedures.
 - 2. Coordination drawings.
 - 3. Requests for Information/Interpretation (RFIs).
 - 4. Project Web site.
 - 5. Project meetings.
 - 6. Progress photographs.

1.2 RELATED REQUIREMENTS:

- A. Section 01 7123 - Field Engineering: Procedures for coordinating general installation and field-engineering services, including establishment of benchmarks and control points.
- B. Section 01 7700 - Closeout Procedures: Procedures for coordinating closeout of the Contract.
- C. Section 01 7419 - Construction Waste Management and Disposal: Procedures for removal, recycling, salvage and reuse of materials generated by construction activities.

1.3 PROJECT TEAM ORGANIZATION AND ROSTER

- A. Subcontract List: Prepare written summary identifying individuals or firms proposed for each portion of the Work, including those who are to supply products or equipment fabricated to a special design. Include the following information in tabular form:
 - 1. Name, address, and telephone number of entity performing subcontract or supplying products.
 - 2. Number and title of related Specification Sections covered by subcontract.
 - 3. Drawing number and detail references, as appropriate, covered by subcontract.
- B. Key Personnel Names: Within 15 business days of starting construction operations, submit a list of key personnel assignments, including superintendent and other personnel in attendance at Project site. Identify individuals and their duties and responsibilities; list addresses and telephone numbers, including home, office, and cellular telephone numbers and e-mail addresses. Provide names, addresses, and telephone numbers of individuals assigned as alternates in the absence of individuals assigned to Project.
 - 1. Post copies of list in project meeting room, in temporary field office, and by each temporary telephone. Keep list current at all times.

1.4 GENERAL COORDINATION PROCEDURES

- A. Prepare memoranda for distribution to each party involved, outlining special procedures required for coordination. Include such items as required notices, reports, and list of attendees at meetings.
 - 1. Prepare similar memoranda for Owner and separate contractors if coordination of their Work is required.
- B. Administrative Procedures: Coordinate scheduling and timing of required administrative procedures with other construction activities to avoid conflicts and to ensure orderly progress of the Work. Such administrative activities include, but are not limited to, the following:
 - 1. Preparation of Contractor's construction schedule.
 - 2. Preparation of the schedule of values.

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3. Installation and removal of temporary facilities and controls.
 4. Delivery and processing of submittals.
 5. Progress meetings.
 6. Preinstallation conferences.
 7. Project closeout activities.
 8. Startup and adjustment of systems.
- C. Conservation: Coordinate construction activities to ensure that operations are carried out with consideration given to conservation of energy, water, and materials. Coordinate use of temporary utilities to minimize waste.
1. Salvage materials and equipment involved in performance of, but not actually incorporated into, the Work. See other Sections for disposition of salvaged materials that are designated as Owner's property.
- D. Reasonably Inferable: Means an item, system or assembly, including components, accessories and facility services, that is either indicated or specified, then all material, labor, equipment and facility services a) that are normally furnished with such systems or assemblies or b) that are necessary to make a complete, coordinated, functioning installation which must be provided whether or not indicated or specified.
1. Items the Contractor either could or should have reasonably anticipated must be included as part of the work, based on 1) the Contractor's skill, knowledge and experience and 2) using objective industry standards and not a subjective standard.
 2. Only those items specifically excepted may be omitted from the project.

1.5 COORDINATION

- A. Coordinate scheduling, submittals, and Work of various Specification sections and Drawing notes to ensure efficient and orderly sequence of installation of interdependent construction elements, with provisions for accommodating items installed later.
- B. Coordinate selection of products specified in different Specification sections for compatibility. Compatibility among Contractor's options are not assured by listed manufacturers or products in the Specifications or Drawings, but must be provided by the Contractor.
- C. Coordinate construction operations for efficient and orderly installation of each part of the Work. Coordinate construction operations for Work specified in different Sections that depend on each other for proper installation, connection, and operation. Lay out Work to provide required headroom and width in egress paths.
- D. Coordinate equipment locations and utility supplies to such locations with manufacturer product information for operational clearances and for maintenance access.
- E. Coordinate completion and clean-up of Work of separate sections in preparation for Substantial Completion and for portions of Work Designated for Owner's partial occupancy.
- F. Preparation of coordination drawings for work of different trades is Contractor's option. Such drawings will not be reviewed by the Architect/Engineer.

1.6 REQUESTS FOR INFORMATION OR INTERPRETATION (RFI)

- A. Definition: A request seeking one of the following:
1. An interpretation, amplification, or clarification of some requirement of the Contract Documents arising from inability to determine from them the exact material process, or system to be installed; or when the elements of construction are required to occupy the same space (interference); or when an item of work is described differently at more than one place in Contract Documents.
 2. A resolution to an issue which has arisen due to field conditions and affects design intent.

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- B. Preparation: Prepare and RFI immediately upon discovery of a need for interpretation of Contract Documents.
 - 1. Prepare a separate RFI for each specific item.
 - a. Review, coordinate, and comment on requests originating with subcontractors and/or material suppliers.
 - b. Do not forward requests which solely require internal coordination between subcontractors.
 - 2. Whenever possible, request clarifications at the next appropriate project progress meeting, with response entered into meeting minutes, rendering unnecessary the issuance of a formal RFI.
- C. RFIs will be accepted and processed by the Architect/Engineer only on Contract Documents prepared by the Architect/Engineer or its consultants that are sealed and have been issued for construction.
- D. Owner Documents: Requests for information or interpretation of Owner-prepared Contract Documents shall be made by normal correspondence, not by RFI. Owner is responsible for responding to such requests. Provide contemporaneous copies to Architect/Engineer.
- E. Immediately on discovery of the need for additional information or interpretation of the Contract Documents, Contractor shall prepare and submit an RFI in the form specified.
 - 1. Coordinate and submit RFIs in a prompt manner so as to avoid delays in Contractor's work or work of subcontractors.
- F. Submission of an RFI constitutes representation that the Contractor requires additional information about the Contract Documents after having made careful study and comparison of the Contract Documents, field conditions, other Owner-provided information, and prior project correspondence or documentation.
- G. RFIs attached to Substitution Requests will not be reviewed and will be returned without comment. Submittals attached to RFIs as Substitution Requests, with or without the Substitution Request Form, will not be reviewed and will be returned without comment.
- H. If upon evaluation of the RFI the Architect/Engineer finds that the requested information is contained in the Contract Documents or by other documents or methods as outlined in paragraph above, the Owner has the option to obtain reimbursement from the Contractor for costs incurred by the Owner for the Architect/Engineer's services and expenses made necessary in answering such requests.
- I. RFI Submission: RFIs shall be submitted in electronic form using Gresham Smith's InfoExchange internet site. Paper RFIs, e-mail, faxes, and other media are not acceptable and will be returned without action.
 - 1. At the beginning of the Project, Gresham Smith will set up accounts for Contractor's authorized personnel, including log-in information and passwords. Users will be able to change passwords after logging in for the first time.
 - 2. Complete the form provided by the InfoExchange software in full. Forms with boxes that are blank will not be processed.
 - 3. In the box marked "Question", insert the text of the request together with Contractor's suggested resolution and other pertinent information.
 - 4. Sketches, diagrams, product data sheets, and other supplementary information may be attached to the form as PDF electronic files, but the actual text of the request must be entered into the form. Forms that have "See attached document" or similar language in the Question box will not be processed.
 - 5. Login site: <http://infox.gspnet.com/userweb/login/login.aspx>
- J. Content of the RFI: Include detailed, legible description of item needing information or interpretation and the following:
 - 1. Project name.
 - 2. Project number.
 - 3. Date.
 - 4. Name of Contractor.
 - 5. Name of Architect/Engineer.
 - 6. RFI number, numbered sequentially.

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7. RFI subject.
 8. Specification Section number and title and related paragraphs, as appropriate.
 9. Drawing number and detail references, as appropriate.
 10. Field dimensions and conditions, as appropriate.
 11. Contractor's suggested resolution. If Contractor's suggested resolution impacts the Contract Time or the Contract Sum, Contractor shall state impact in the RFI.
 12. Contractor's signature.
 13. Attachments: Include sketches, descriptions, measurements, photos, Product Data, Shop Drawings, coordination drawings, and other information necessary to fully describe items needing interpretation.
 - a. Include dimensions, thicknesses, structural grid references, and details of affected materials, assemblies, and attachments on attached sketches.
 - b. Contractor's suggested resolution: A written and/or a graphic solution, to scale, is required in cases where clarification of coordination issues is involved, got example: routing, clearances, and/or specific locations of work shown diagrammatically in Contract Documents.
- K. Architect/Engineer's Action: Architect/Engineer will review each RFI, determine action required, and respond. Allow 5 business days for Architect/Engineer's response for each RFI. RFIs received by Architect/Engineer after 2:00 p.m. local time at the project site will be considered as received the following business day.
1. The following Contractor-generated RFIs will be returned without action:
 - a. Requests for approval of submittals.
 - b. Requests for approval of substitutions.
 - c. Requests for approval of Contractor's means and methods.
 - d. Requests for coordination information already indicated in the Contract Documents.
 - e. Requests for adjustments in the Contract Time or the Contract Sum.
 - f. Requests for interpretation of Architect/Engineer's actions on submittals.
 - g. Requests not prepared in compliance with requirements of this section, and/or missing key information required to render an actionable response.
 - h. Requests by other entities controlled by Contractor.
 2. Architect/Engineer's action may include request for additional information or clarification, in which case Architect/Engineer's time for response will date from time of receipt of additional information or clarification from Contractor. Identify the amended RFI with an R suffix to the original number.
 3. Content of answered RFI will not constitute in any manner a directive or authorization to perform extra work or delay the project. If Contractor believes the RFI response warrants change in the Contract Time or the Contract Sum, notify Architect/Engineer in writing within 5 business days of receipt of the RFI response and submit a Change Order Proposal according to Section 01 2600.
 4. Requests for information or interpretation of preliminary drawings or specifications shall be made by normal correspondences, not by RFI. Architect/Engineer's response to such requests do not constitute Contract requirements for the Work.
 5. Frivolous RFIs: Requests regarding information that is clearly indicated on, or reasonably inferable from, Contract Documents, submittals and Owner furnished documentation with no additional input required to clarify the question. They will be returned without a response, with an explanatory notation.
 - a. The Client reserves the right to assess the Contractor for the costs (on time-and-materials basis) incurred by the Architect/Engineer, and any of its consultants, due to processing of such RFIs.
- L. RFI Log: Prepare, maintain, and submit a tabular log of RFIs organized by RFI number. Submit copies of log at Owner-Architect-Contractor meetings.
1. Project name.
 2. Name and address of Contractor.
 3. Name and address of Architect or Engineer.
 4. RFI number including RFIs that were returned without action or withdrawn.
 5. RFI description.
 6. Date the RFI was submitted.
 7. Date Architect/Engineer's response was received.
 8. Indicate current status of every RFI. Update log promptly and on a regular basis.

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9. Highlight items requiring priority or expedited response.
 10. Highlight items for which a timely response has not been received to date.
- M. On receipt of Architect/Engineer's action, update the RFI log and immediately distribute the RFI response to affected parties. Review response and notify Architect/Engineer within three business days if Contractor disagrees with response.
1. Include identification of related Minor Change in the Work, Amendment, and Proposal Request, as appropriate.
 2. Include identification of related Field Order, and Proposal Request, as appropriate.

1.7 PROJECT MEETINGS

- A. General: Schedule and conduct meetings and conferences at Project site unless otherwise indicated.
1. Attendees: Inform participants and others involved, and individuals whose presence is required, of date and time of each meeting. Notify Owner and Architect/Engineer of scheduled meeting dates and times.
 2. Agenda: Prepare the meeting agenda. Distribute the agenda to all invited attendees.
 3. Minutes: Entity responsible for conducting meeting will record significant discussions and agreements achieved. Distribute the meeting minutes to everyone concerned, including Owner and Architect/Engineer, within three business days of the meeting.
- B. Preconstruction Conference: Schedule and conduct preconstruction conference before starting construction, at a time convenient to Owner and Architect/Engineer, but not later than 15 business days after execution of the Agreement.
1. Conduct the conference to review responsibilities and personnel assignments.
 2. Attendees: Authorized representatives of Owner, Architect/Engineer, and their consultants; Contractor and its superintendent; major subcontractors; suppliers; and other concerned parties shall attend the conference. Participants at the conference shall be familiar with Project and authorized to conclude matters relating to the Work.
 3. Record and distribute meeting minutes.
 4. Agenda: Discuss items of significance that could affect progress.
 - a. Introduction of Design Project Team, Owner Team and Contractor Team members.
 - b. Review of third party testing requirements and contractual responsibilities.
 - c. Correspondence Review:
 - 1) Project Information Exchange medium (email, phone, text, etc.) and frequency of updates (per contract; weekly, bi-weekly; monthly; particular milestones; etc.). Communications forms and routing.
 - d. Request for Interpretation (RFI) process, information required and distribution.
 - e. Proposed Substitutions: Substitution Request Form, tracking method and information on design acceptance, specifications and cost of redesign fees.
 - f. Submittals (Shop Drawings, Product Data, Samples, etc.); Review criteria, processing time, Contract Document conformance and shared subcontractor products, such as sealants, firestopping and access panels, etc.
 - 1) Submission of Contractor's Submittal Schedule in relationship to first Application for Payment.
 - 2) Submittal Review Meetings as required by the Contract Documents.
 - g. Pre-Installation Conferences: Timing, mock-ups and specification reviews.
 - h. Material Testing: Defined scope, scheduling responsibility and report distribution.
 - i. Application for Payment: Schedule of Values detail and approval, review meeting requirement and change order inclusion.
 - j. Changes in Work or Owner Requested Change: Amendment; Field Order (FO); Proposed Request (PR) with back up for approval.
 - k. Record Documents: Job site location, updates and as-built accuracy.
 - l. Substantial Completion: Understanding of warranty date and Temporary Certificate of Occupancy (TOC) Certification.
 - m. Punch Lists: Procedures, attendees and signoff/back check/verification.

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- n. Close Out: Log review and approval, format and client training/start-up.
- o. Additional Items:
 - 1) Job Site Security.
 - 2) Off Hours Emergency Site Contact and Access.
 - 3) Procedures for Owner Vendors, visitors, events and document dating.
- C. Preinstallation Conferences: Conduct a preinstallation conference at Project site before each construction activity that requires coordination with other construction.
 - 1. Attendees: Installer and representatives of manufacturers and fabricators involved in or affected by the installation and its coordination or integration with other materials and installations that have preceded or will follow, shall attend the meeting. Advise Architect/Engineer of scheduled meeting dates.
 - 2. Agenda: Review progress of other construction activities and preparations for the particular activity under consideration.
 - a. Contract Documents, options, related RFIs and change orders.
 - b. Purchases, deliveries, submittals and weather limitations.
 - c. Review of mock-ups, conflicts, compatibility requirements and time schedules.
 - d. Manufacturer recommendations, warranty requirements, compatibility of materials and acceptability of substrates.
 - e. Testing and inspecting requirements, installation procedures, coordination with other work.
 - f. Required performance results, protection of other work and personnel.
 - 3. Record significant conference discussions, agreements, and disagreements, including required corrective measures and actions.
 - 4. Reporting: Distribute minutes of the meeting to each party present and to other parties requiring information.
 - 5. Do not proceed with installation if the conference cannot be successfully concluded. Initiate whatever actions are necessary to resolve impediments to performance of the Work and reconvene the conference at earliest feasible date.
- D. Project Closeout Conference: Schedule and conduct project closeout conference, at a time convenient to Owner and Architect/Engineer, but not later than 90 business days before scheduled date of Substantial Completion.
 - 1. Conduct the conference to review requirements and responsibilities related to Project closeout.
 - 2. Attendees: Authorized representatives of Owner, Architect/Engineer, and their consultants; Contractor and its superintendent; major subcontractors; suppliers; and other concerned parties shall attend the meeting. Participants at the meeting shall be familiar with Project and authorized to conclude matters relating to the Work.
 - 3. Agenda: Discuss items of significance that could affect or delay Project closeout, including the following:
 - a. Preparation of record documents.
 - b. Procedures required before inspection for Substantial Completion and for final inspection for acceptance.
 - c. Submittal of written warranties, Sustainable Design documentation, operations and maintenance data.
 - d. Requirements for delivery of material samples, extra materials ('attic stock'), and spare parts.
 - e. Requirements for demonstration and training; and Contractor's punch list.
 - f. Procedures for processing Applications for Payment at Substantial Completion and for final payment.
 - g. Submittal requirements, coordination of separate contracts, possible partial occupancy requirements, installation of Owner's furniture/fixtures/equipment and responsibility for removing temporary facilities and controls.
 - 4. Minutes: Record and distribute meeting minutes.
- E. Progress Meetings: Conduct progress meetings at biweekly intervals.
 - 1. Coordinate dates of meetings with preparation of payment requests.

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2. Attendees: In addition to representatives of Owner, and Architect/Engineer, each contractor, subcontractor, supplier, and other entity concerned with current progress or involved in planning, coordination, or performance of future activities shall be represented at these meetings. All participants at the meeting shall be familiar with Project and authorized to conclude matters relating to the Work.
 3. Agenda: Review and correct or approve minutes of previous progress meeting. Review other items of significance that could affect progress. Include topics for discussion as appropriate to status of Project.
 - a. Contractor's Construction Schedule: Review progress since the last meeting. Determine whether each activity is on time, ahead of schedule, or behind schedule, in relation to Contractor's construction schedule. Determine how construction behind schedule will be expedited; secure commitments from parties involved to do so. Discuss whether schedule revisions are required to ensure that current and subsequent activities will be completed within the Contract Time.
 - 1) Review schedule for next period.
 - b. Review present and future needs of each entity present, including the following:
 - 1) Interface requirements and sequence of operations.
 - 2) Resolution of BIM component conflicts.
 - 3) Status of submittals, deliveries and off-site fabrication.
 - 4) Access, site utilization, temporary facilities/controls, progress cleaning, quality and work standards.
 - 5) Status of correction of deficient items, field observations, RFI status, proposal request status, pending changes and Change Orders, pending claims and disputes.
 - 6) Documentation of information for payment requests.
 - 7) Any open action items from previous meetings.
 4. Minutes: Record and distribute the meeting minutes to each party present and to parties requiring information.
 - a. Schedule Updating: Revise Contractor's construction schedule after each progress meeting where revisions to the schedule have been made or recognized. Issue revised schedule concurrently with the report of each meeting.
- F. Coordination Meetings: Conduct Project coordination meetings at biweekly intervals. Project coordination meetings are in addition to specific meetings held for other purposes, such as progress meetings and preinstallation conferences.
1. Attendees: In addition to representatives of Owner, and Architect/Engineer, each contractor, subcontractor, supplier, and other entity concerned with current progress or involved in planning, coordination, or performance of future activities shall be represented at these meetings. All participants at the meetings shall be familiar with Project and authorized to conclude matters relating to the Work.
 2. Agenda: Review and correct or approve minutes of the previous coordination meeting. Review other items of significance that could affect progress. Include topics for discussion as appropriate to status of Project.
 - a. Combined Contractor's Construction Schedule: Review progress since the last coordination meeting. Determine whether each contract is on time, ahead of schedule, or behind schedule, in relation to combined Contractor's construction schedule. Determine how construction behind schedule will be expedited; secure commitments from parties involved to do so. Discuss whether schedule revisions are required to ensure that current and subsequent activities will be completed within the Contract Time.
 - b. Schedule Updating: Revise combined Contractor's construction schedule after each coordination meeting where revisions to the schedule have been made or recognized. Issue revised schedule concurrently with report of each meeting.
 - c. Review present and future needs of each contractor present, including the following:
 - 1) Interface requirements and sequence of operations.
 - 2) Status of submittals, deliveries and off-site fabrication.
 - 3) Work hours, access, site utilization and temporary facilities/controls.
 - 4) Progress cleaning, hazards and risks.
 - 5) Change orders, quality and work standards.

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3. Reporting: Record meeting results and distribute copies to everyone in attendance and to others affected by decisions or actions resulting from each meeting.

1.8 PROGRESS PHOTOGRAPHS

- A. Submit photographs with each application for payment, taken not more than 3 business days prior to submission of application for payment.
- B. Submit new photographs at least once a month, within 3 business days after being taken.
- C. Maintain one set of all photographs at project site for reference; same copies as submitted, identified as such.
- D. Photography Type: Digital; electronic files.
- E. Provide photographs of site and construction throughout progress of work produced by an experienced photographer.
- F. Views:
 1. Consult with Architect/Engineer for instructions on views required.
 2. Provide factual presentation.
 3. Provide correct exposure and focus, high resolution and sharpness, maximum depth of field, and minimum distortion.
 4. Key Plan: Submit key plan with notation of vantage points, marked for location and direction of each photograph.
- G. Digital Photographs: 24-bit color, minimum resolution of 1024 by 768, in JPG format; provide files unaltered by photo editing software.
 1. Delivery Medium: Submit through Newforma Info Exchange.
 2. File Naming: Include project identification, date and time of view, and view identification.
 3. Key Plan: Include digital copy of key plan with each electronic submittal; include point of view identification in each photo file name.
 4. PDF File: Assemble all photos into printable pages in PDF format, with 2 to 3 photos per page, each photo labeled with file name; one PDF file per submittal.

1.9 DAILY CONSTRUCTION REPORTS

- A. Include only factual information. Do not include personal remarks or opinions regarding operations and/or personnel.
- B. In addition to transmitting electronically a copy to Owner and Architect/Engineer, submit two printed copies at weekly intervals.
 1. Submit in format acceptable to Owner.
 2. Submit using required form, a sample of which is appended to this section.
- C. Prepare a daily construction report recording the following information concerning events at Project site and project progress:
 1. Date and weather conditions.
 2. List of Subcontractors and separate contractors at Project site, with breakdown count of personnel type.
 3. Major equipment at Project site., material deliveries and safety, environmental or industrial relation incidents.
 4. Meter readings and similar recordings, emergency procedures, and unusual events (submit a separate special report).

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5. Stoppages, delays shortages, and losses. Include comparison between scheduled work activities (in Contractor's most recently updated and published schedule) and actual activities. Explain differences, if any. Note days or periods when no work was in progress and explain the reasons why.
6. Directives and requests of Authority(s) Having Jurisdiction (AHJ), change orders received and implemented, testing and/or inspections performed, list of verbal instructions given by Architect/Engineer/Owner.
7. Signature of Contractor's authorized representative.

PART 2 - PRODUCTS – NOT USED

PART 3 - EXECUTION – NOT USED

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END OF SECTION 01 3100

**SECTION 01 3216
CONSTRUCTION PROGRESS SCHEDULE**

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Preliminary schedule.
- B. Construction progress schedule, bar chart type.

1.2 REFERENCE STANDARDS

- A. AGC (CPSM) - Construction Planning and Scheduling Manual; 2004.
- B. M-H (CPM) - CPM in Construction Management - Project Management with CPM; 2016, with Addendum (2021).

1.3 SUBMITTALS

- A. Within 10 days after date of Agreement, submit preliminary schedule.
- B. If preliminary schedule requires revision after review, submit revised schedule within 10 days.
- C. Within 20 days after review of preliminary schedule, submit draft of proposed complete schedule for review.
 - 1. Include written certification that major contractors have reviewed and accepted proposed schedule.
- D. Within 10 days after joint review, submit complete schedule.
- E. Submit updated schedule with each Application for Payment.
- F. Submit in PDF format.
- G. Submit the number of opaque reproductions that Contractor requires, plus two copies that will be retained by Architect/Engineer.
- H. Submit one reproducible transparency and one opaque reproduction.
- I. Submit under transmittal letter form specified in Section 01 3100.

1.4 QUALITY ASSURANCE

- A. Scheduler: Contractor's personnel or specialist Consultant specializing in CPM scheduling with 3 years minimum experience in scheduling construction work of a complexity comparable to this Project, and having use of computer facilities capable of delivering a detailed graphic printout within 48 hours of request.
- B. Contractor's Administrative Personnel: 3 years minimum experience in using and monitoring CPM schedules on comparable projects.

1.5 SCHEDULE FORMAT

- A. Listings: In chronological order according to the start date for each activity. Identify each activity with the applicable specification section number.
- B. Diagram Sheet Size: Maximum 22 x 17 inches.

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- C. Sheet Size: Multiples of 8-1/2 x 11 inches.
- D. Scale and Spacing: To allow for notations and revisions.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.1 PRELIMINARY SCHEDULE

- A. Prepare preliminary schedule in the form of a horizontal bar chart.

3.2 CONTENT

- A. Show complete sequence of construction by activity, with dates for beginning and completion of each element of construction.
- B. Identify each item by specification section number.
- C. Identify work of separate stages and other logically grouped activities.
- D. Provide sub-schedules for each projection location identified in Section 01 1000 - Summary.
- E. Provide sub-schedules to define critical portions of the entire schedule.
- F. Include conferences and meetings in schedule.
- G. Show accumulated percentage of completion of each item, and total percentage of Work completed, as of the first day of each month.
- H. Provide separate schedule of submittal dates for shop drawings, product data, and samples, owner-furnished products, and dates reviewed submittals will be required from Architect/Engineer. Indicate decision dates for selection of finishes.
- I. Indicate delivery dates for owner-furnished products.
- J. Coordinate content with schedule of values specified in Section 01 2000 - Price and Payment Procedures.
- K. Provide legend for symbols and abbreviations used.

3.3 BAR CHARTS

- A. Include a separate bar for each major portion of Work or operation.
- B. Identify the first work day of each week.

3.4 NETWORK ANALYSIS

- A. Prepare network analysis diagrams and supporting mathematical analyses using the Critical Path Method.
- B. Illustrate order and interdependence of activities and sequence of work; how start of a given activity depends on completion of preceding activities, and how completion of the activity may restrain start of subsequent activities.
- C. Mathematical Analysis: Tabulate each activity of detailed network diagrams, using calendar dates, and identify for each activity:

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1. Preceding and following event numbers.
 2. Activity description.
 3. Estimated duration of activity, in maximum 15 day intervals.
 4. Earliest start date.
 5. Earliest finish date.
 6. Actual start date.
 7. Actual finish date.
 8. Latest start date.
 9. Latest finish date.
 10. Total and free float; float time shall accrue to Owner and to Owner's benefit.
 11. Monetary value of activity, keyed to Schedule of Values.
 12. Percentage of activity completed.
 13. Responsibility.
- D. Analysis Program: Capable of compiling monetary value of completed and partially completed activities, accepting revised completion dates, and recomputing all dates and float.
- E. Required Reports: List activities in sorts or groups:
1. By preceding work item or event number from lowest to highest.
 2. By amount of float, then in order of early start.
 3. By responsibility in order of earliest possible start date.
 4. In order of latest allowable start dates.
 5. In order of latest allowable finish dates.
 6. Contractor's periodic payment request sorted by Schedule of Values listings.
 7. Listing of basic input data that generates the report.
 8. Listing of activities on the critical path.

3.5 REVIEW AND EVALUATION OF SCHEDULE

- A. Participate in joint review and evaluation of schedule with Architect/Engineer at each submittal.
- B. Evaluate project status to determine work behind schedule and work ahead of schedule.
- C. After review, revise as necessary as result of review, and resubmit within 10 days.

3.6 UPDATING SCHEDULE

- A. Maintain schedules to record actual start and finish dates of completed activities.
- B. Indicate progress of each activity to date of revision, with projected completion date of each activity.
- C. Annotate diagrams to graphically depict current status of Work.
- D. Identify activities modified since previous submittal, major changes in Work, and other identifiable changes.
- E. Indicate changes required to maintain Date of Substantial Completion.
- F. Submit reports required to support recommended changes.
- G. Provide narrative report to define problem areas, anticipated delays, and impact on the schedule. Report corrective action taken or proposed and its effect.

3.7 DISTRIBUTION OF SCHEDULE

- A. Distribute copies of updated schedules to Contractor's project site file, to subcontractors, suppliers, Architect/Engineer, Owner, and other concerned parties.

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- B. Instruct recipients to promptly report, in writing, problems anticipated by projections indicated in schedules.

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END OF SECTION 01 3216

**SECTION 01 3233
PHOTOGRAPHIC DOCUMENTATION**

PART 1 -GENERAL

1.1 SUMMARY

- A. Section includes administrative and procedural requirements for the following:
 - 1. Preconstruction photographs.
 - 2. Construction photographs.
 - 3. Final completion construction photographs.
- B. Related Requirements:
 - 1. Section 01 3100 Project Management and Coordination: Progress Photographs

1.2 ALLOWANCES

- A. Costs: Photographic documentation services are included under the cash allowance for construction photographic services established in Section 01 2100.

1.3 UNIT PRICES

- A. Basis for Bid: Base number of construction photographs on average of 20 photographs per month over the duration of Project.

1.4 INFORMATIONAL SUBMITTALS

- A. Key Plan: Submit key plan of Project Site with notation of vantage points marked for location and direction of each photograph. Include same information as corresponding photographic documentation.
 - 1. Indicate elevation or level of construction.
- B. Digital Photographs: Submit image files within 3 business days of taking photographs through Newforma Info Exchange.
 - 1. Digital Camera: 24-bit color.
 - 2. Format: Minimum 1024 x 768 resolution, in unaltered original files, with same aspect ratio as the sensor, uncropped, date and time stamped, accompanied by key plan file.
 - 3. Identification: Provide the following information with each image description in file metadata tag:
 - a. Name of Project.
 - b. Date photograph was taken, if not automatically date/time stamped.
 - c. Description of vantage point, indicating location, direction (by compass point) and elevation or level of construction.
 - d. Unique sequential identifier keyed to accompanying key plan.
 - e. Weather conditions at time photographs were taken.
- C. Video Recordings: Submit video recordings within 3 business days of recording through Newforma Info Exchange.
 - 1. Format: High-resolution digital video file in format acceptable to Client.
 - 2. Identification: With each submittal, provide the following information:
 - a. Name of Project.
 - b. Date video recording was recorded.
 - c. Description of vantage point, indicating location, direction (by compass point) and elevation or level of construction.
 - d. Weather conditions at time of recording.

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- D. Time Lapse Video Documentation: Submit time-lapse sequence video recordings through Newforma Info Exchange.
 - 1. Identification: For each recording, provide the following information:
 - a. Name of Project.
 - b. Dates and times video recording was recorded.
 - c. Description of vantage point, indicating location, direction (by compass point) and elevation or level of construction.
 - d. Weather conditions at time of recording.

1.5 USAGE RIGHTS

- A. If a professional photographer or videographer is engaged to take photographs or video recordings, obtain and transfer copyright usage rights from professional photographer to Client for unlimited reproduction and use of submitted documentation.

PART 2 -PRODUCTS

2.1 PHOTOGRAPHIC MEDIA

- A. Digital Images: Provide images in JPG format, produced by a 24-bit color digital camera with minimum image resolution of not less than 1024 x 768 pixels.
- B. Digital Video Recordings: Provide high-resolution, digital video file in format acceptable to Client.

2.2 WEB-BASED PHOTOGRAPHIC DOCUMENTATION

- A. Project Camera: Provide fixed exterior camera installation, mounted to provide unobstructed view of construction site from location approved by Architect/Engineer.
 - 1. Provide 1 fixed-location cameras, with the following characteristics:
 - a. Static view, time lapse capable.
 - b. Remotely controllable view with mouse-click user navigation for horizontal pan, vertical tilt, and optical zoom of 500% minimum.
 - c. Capable of producing minimum 3-megapixel pictures.
 - d. Provide power supply, active high-speed data connection to service provider's network, and static public IP address for each camera.
- B. Web-Based Image Access: Password-protected access for Project team administered by Contractor, providing current image access and archival image access by date and time, with images downloadable to viewer's device.
 - 1. Provide public viewer open access to most recent project camera image.

PART 3 -EXECUTION

3.1 CONSTRUCTION PHOTOGRAPHS

- A. General: Take photographs using maximum in focus view, to clearly show the Work. Photographs with blurry or out-of-focus areas will not be accepted.
 - 1. Maintain key plan with each set of construction photographs that identifies each photographic location.
- B. Digital Images: Submit digital images exactly as originally recorded in the digital camera, without alteration, manipulation, editing, or modifications.
 - 1. Date and Time: Include date and time in file name for each image.
 - 2. Field Office Images: Maintain one set of images accessible in the field office at Project site, available at all times for reference. Identify images in the same manner as those submitted to Architect.

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- C. Preconstruction Photographs: Before starting excavation, take photographs of Project site and surrounding properties, including existing items to remain during construction, from different vantage points, as directed by Architect/Engineer.
 - 1. Flag excavation areas before taking construction photographs.
 - 2. Take at least 20 photographs to show existing conditions adjacent to property before starting the Work.
 - 3. Take at least 20 photographs of existing buildings either on or adjoining property to accurately record physical conditions at start of construction.
 - 4. Take additional photographs as required to record settlement or cracking of adjacent structures, pavements, and improvements.
 - 5. After excavation and/or demolition, take photographs from same vantage point to show post excavation and/or demolition conditions.
- D. Periodic Construction Photographs: Take at least 20 photographs monthly, coinciding with the cutoff date associated with each Application for Payment. Select vantage points to show status of construction and progress since last photographs were taken.
- E. Architect/Engineer-Directed Construction Photographs: From time to time, Architect or Engineer will instruct photographer about number and frequency of photographs and general directions on vantage points. Select actual vantage points and take photographs to show the status of construction and progress since last photographs were taken.
- F. Time-Lapse Sequence Construction Photographs: Take at least 20 photographs as indicated, to show status of construction and progress since last photographs were taken.
 - 1. Frequency: Take photographs monthly, coinciding with the cutoff date associated with each Application for Payment.
 - 2. Vantage Points: Following suggestions by Architect/Engineer and Contractor, photographer to select vantage points. During each of the following construction phases, take not less than 2 of the required shots from same vantage point each time to create a time-lapse sequence.
- G. Final Completion Construction Photographs: Take at least 20 color photographs after date of Substantial Completion for submission as project record documents. Architect/Engineer will inform photographer of desired vantage points.
- H. Additional Photographs: Architect/Engineer may request photographs in addition to periodic photographs specified. Additional photographs will be paid for by Change Order and are not included in the Contract Sum or in the Allowance for construction photographs.
 - 1. Three days' notice will be given, where feasible.
 - 2. In emergency situations, take additional photographs within 24 hours of request.
 - 3. Circumstances that could require additional photographs include:
 - a. Special events planned at Project site.
 - b. Immediate follow-up when on-site events result in construction damage or losses.
 - c. Photographs to be taken at fabrication locations away from Project site. These photographs are not subject to unit prices or unit-cost allowances.
 - d. Substantial Completion of a major phase or component of the Work.
 - e. Extra record photographs at time of final acceptance.
 - f. Owner's request for special publicity photographs.

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END OF SECTION 01 3233

**SECTION 01 3300
SUBMITTAL PROCEDURES**

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes administrative and procedural requirements for submitting Shop Drawings, Product Data, Samples, and other submittals.
- B. Related Sections include the following:
 - 1. Division 01 Section "Payment Procedures" for submitting Application for Payment.
 - 2. Division 01 Section "Construction Progress Documentation" for submitting schedules and reports, including Contractor's Construction Schedule.
 - 3. Division 01 Section "Closeout Procedures" for submitting warranties and Project Record Documents.
- C. Unless otherwise noted in the individual specification sections, specifications are written in a manner which allows for multiple providers to provide that material, equipment or service. In cases where there is a need to limit the provider choices, or prescribe one choice, that requirement will be stated in the individual specification section. The three options for specification types are "Or Equal", "Performance" and "Prescriptive" as defined in the paragraphs below.
 - 1. Note that not all materials, equipment, system, assembly or fabrication are interchangeable, the burden of coordinating an alternative material, equipment, system, assembly or fabrication selection remains the responsibility of the Contractor.
- D. Specification definitions:
 - 1. Or Equal with a list of approved material or equipment options. This applies to material or equipment that is equally acceptable from multiple providers, but those providers may not be listed. This is the default option.
 - 2. Performance Specification with a Basis of Design. The specification lists the required performance requirements/criteria with a limited list of providers that can meet that performance. The first provider listed is the preferred provider and Basis of Design, unless the Contractor demonstrates a substantial benefit to the project by using one of the other providers. Use of a non-listed provider will be considered a substitute and the contractor must submit the request through the Substitution Request process.
 - 3. Prescriptive (Basis of Design only). The provider listed, along with the performance criteria, is the only provider the Architect/Engineer will accept. Use of a non-listed provider will be considered a substitute and the contractor must submit the request through the Substitution Request process.
 - a. Note that the use of "Prescriptive" in this context is in regards to specifications only and is not meant to apply to any prescriptive building code requirements.

1.2 DEFINITIONS

- A. Action Submittals: Written and graphic information that requires Architect/Engineer's responsive action.
- B. Informational Submittals: Written information that does not require Architect/Engineer's approval.
- C. Submittals may be rejected for not complying with requirements.

1.3 SUBMITTAL SCHEDULE

- A. Submittal Schedule: Submit a complete schedule of submittals, arranged in chronological order by dates required by the construction schedule, based on the entire Contract Document package. Include time required for review, ordering, manufacturing, fabrication, and delivery with established dates. Include additional time required for making corrections or modifications to submittals noted by the Architect/Engineer and additional time for handling and reviewing submittals required by those conditions.

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1. Coordinate submittal schedule with list of subcontracts, the schedule of values, and Contractor's construction schedule.
2. No submittals will be reviewed until the complete submittal schedule is received. See Section 01 2900 for requirements to submit this schedule prior to or with the first pay application.
3. Format: Arrange the following information in tabular form.
 - a. Scheduled date for the first submittal.
 - b. Specification Section number and title.
 - c. Submittal category: Action, informational.
 - d. Name of subcontractor.
 - e. Description of the Work covered.
 - f. Schedules date for Architect/Engineer's response.
 - g. Scheduled dates for purchasing.
 - h. Schedules dates for installation.
 - i. Activity or event number.
4. Review Initiation Date: Date submittal is received in the Architect/Engineer's office. Submittals received by Architect/Engineer after 2:00 PM local time at the project site will be considered as received the following business day.
5. Review Completion Date: Date submittal leaves the Architect/Engineer's office.

1.4 SUBMITTAL PROCEDURES

- A. General: Electronic copies of base plans of the Contract Drawings for Contractor's use in preparing submittals will not be provided.
- B. Coordination: Coordinate preparation and processing of submittals with performance of construction activities.
 1. Coordinate each submittal with fabrication, purchasing, testing, delivery, other submittals, and related activities that require sequential activity.
 2. Coordinate transmittal of different types of submittals for related parts of the Work so processing will not be delayed because of need to review submittals concurrently for coordination.
 - a. Architect/Engineer reserves the right to withhold action on a submittal requiring coordination with other submittals until related submittals are received.
- C. Processing Time: Allow enough time for submittal review, including time for resubmittals, as follows. Time for review shall commence on Owner's receipt of submittal.
 1. Initial Review: Allow 10 business days for initial review of each submittal. Allow additional time if processing must be delayed for permit coordination with subsequent submittals. Owner will advise Contractor when a submittal being processed must be delayed for coordination.
 2. If re-submittal is necessary, process it in same manner as initial submittal.
 3. Allow 10 business days for processing each re-submittal.
 4. No extension of the Contract Time will be authorized because of failure to transmit submittals enough in advance of the Work to permit processing.
 5. Submittals out of sequence from agreed upon schedule and issued specifications may result in back charges to the Contractor.
- D. Identification: Place a permanent label or title block on each submittal for identification.
 1. Indicate name of firm or entity that prepared each submittal on label or title block.
 2. Provide a space on label or beside title block to record Contractor's review and approval markings.
 3. Include the following information on the label for processing and recording action taken:
 - a. Project name.
 - b. Date.
 - c. Name and address of Contractor.
 - d. Name and address of subcontractor.
 - e. Name and address of supplier.
 - f. Name of manufacturer.

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- g. Unique identifier, including revision number.
 - h. Number and title of appropriate Specification Section.
 - i. Drawing number and detail references, as appropriate.
 - j. Other necessary identification.
- E. Deviations: Highlight, encircle, or otherwise identify deviations from the Contract Documents on submittals. **Contractor shall denote ALL exceptions or deviations from the specification by citing the specification section and paragraph that is at issue.**
- F. Copies: Unless additional copies are required for final submittal, and unless Owner observes noncompliance with provisions of the Contract Documents, initial submittal may serve as final submittal.
 - 1. Submit one copy of submittal to concurrent reviewer in addition to specified number of copies to Owner.
 - 2. Additional copies submitted for maintenance manuals will not be marked with action taken and will be returned.
- G. Transmittal: Package each submittal individually and appropriately for transmittal and handling. Transmit each submittal using a transmittal form. Owner will return submittals, without review, received from sources other than Contractor.
- H. Distribution: Furnish copies of final submittals to manufacturers, subcontractors, suppliers, fabricators, installers, authorities having jurisdiction, and others as necessary for performance of construction activities. Show distribution on transmittal forms.
- I. Use for Construction: Use only final submittals with mark indicating action taken by Owner in connection with construction.

PART 2 - PRODUCTS

2.1 ACTION SUBMITTALS

- A. General: Prepare and submit Action Submittals required by individual Specification Sections. The Architect/Engineer will provide access to Newforma document management software without cost to Contractor. Contractor shall use the standard transmittal forms provided by the Architect/Engineer. Using e-mail or other proprietary software is not acceptable.
- B. Product Data: Collect information into a single submittal for each element of construction and type of product or equipment.
 - 1. If information must be specially prepared for submittal because standard printed data are not suitable for use, submit as Shop Drawings, not as Product Data.
 - 2. Mark each copy of each submittal to show which products and options are applicable.
 - 3. Include the following information, as applicable:
 - a. Manufacturer's written recommendations.
 - b. Manufacturer's product specifications.
 - c. Manufacturer's installation instructions.
 - d. Standard color charts.
 - e. Manufacturer's catalog cuts.
 - f. Wiring diagrams showing factory-installed wiring.
 - g. Printed performance curves.
 - h. Operational range diagrams.
 - i. Mill reports.
 - j. Standard product operating and maintenance manuals.
 - k. Compliance with recognized trade association standards.
 - l. Compliance with recognized testing agency standards.
 - m. Application of testing agency labels and seals.
 - n. Notation of coordination requirements.

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- o. Sustainable Design documentation, forms and manufacturer information indicating compliance with requirements, include the Material Content Form and Prohibited Content Installer Certification.
 - 4. Number of Copies: Submit three copies, plus the number of copies the Contractor desires to have returned.
- C. Shop Drawings: Prepare Project-specific information, drawn accurately to scale. Do not base Shop Drawings on reproductions of the Contract Documents or standard printed data.
 - 1. Preparation: Include the following information, as applicable:
 - a. Dimensions.
 - b. Identification of products.
 - c. Fabrication and installation drawings.
 - d. Roughing-in and setting diagrams.
 - e. Wiring diagrams showing field-installed wiring, including power, signal, and control wiring.
 - f. Shopwork manufacturing instructions.
 - g. Templates and patterns.
 - h. Schedules.
 - i. Design calculations.
 - j. Compliance with specified standards.
 - k. Notation of coordination requirements.
 - l. Notation of dimensions established by field measurement.
 - 2. Number of Copies: Submit three copies plus the number of copies the Contractor desires to have returned of each submittal Owner will retain three prints; remainder will be returned.
- D. Samples: Prepare physical units of materials or products, including the following:
 - 1. Samples for Initial Selection: Submit manufacturer's color charts consisting of units or sections of units showing the full range of colors, textures, and patterns available.
 - 2. Samples for Verification: Submit full-size units or Samples of size indicated, prepared from the same material to be used for the Work, cured and finished in manner specified, and physically identical with the product proposed for use, and that show full range of color and texture variations expected. Samples include, but are not limited to, the following: partial sections of manufactured or fabricated components; small cuts or containers of materials; complete units of repetitively used materials; swatches showing color, texture, and pattern; color range sets; and components used for independent testing and inspection.
 - 3. Preparation: Mount, display, or package Samples in manner specified to facilitate review of qualities indicated. Attach label on unexposed side that includes the following:
 - a. Generic description of Sample.
 - b. Product name or name of manufacturer.
 - c. Sample source.
 - d. Submit a single Sample where assembly details, workmanship, fabrication techniques, connections, operation, and other similar characteristics are to be demonstrated.
 - 4. Disposition: Maintain sets of approved Samples at Project site, available for quality-control comparisons throughout the course of construction activity. Sample sets may be used to determine final acceptance of construction associated with each set.
- E. Subcontract List: Prepare a written summary identifying individuals or firms proposed for each portion of the Work, including those who are to furnish products or equipment fabricated to a special design. Include the following information in tabular form:
 - 1. Name, address, and telephone number of entity performing subcontract or supplying products.
 - 2. Number and title of related Specification Section(s) covered by subcontract.
 - 3. Drawing number and detail references, as appropriate, covered by subcontract.

2.2 INFORMATIONAL SUBMITTALS

- A. General: Prepare and submit Informational Submittals required by other Specification Sections.

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1. Number of Copies: Submit two copies of each submittal, unless otherwise indicated. Owner will not return copies.
 2. Certificates and Certifications: Provide a notarized statement that includes signature of entity responsible for preparing certification. Certificates and certifications shall be signed by an officer or other individual authorized to sign documents on behalf of that entity.
 3. Test and Inspection Reports: Comply with requirements in Division 1 Section "Quality Requirements."
- B. Qualification Data: Prepare written information that demonstrates capabilities and experience of firm or person. Include lists of completed projects with project names and addresses, names and addresses of Architects/Engineers and owners, and other information specified.
- C. Product Certificates: Prepare written statements on manufacturer's letterhead certifying that product complies with requirements.
- D. Welding Certificates: Prepare written certification that welding procedures and personnel comply with requirements. Submit record of Welding Procedure Specification (WPS) and Procedure Qualification Record (PQR) on AWS forms. Include names of firms and personnel certified.
- E. Installer Certificates: Prepare written statements on manufacturer's letterhead certifying that Installer complies with requirements and, where required, is authorized for this specific Project.
- F. Manufacturer Certificates: Prepare written statements on manufacturer's letterhead certifying that manufacturer complies with requirements. Include evidence of manufacturing experience where required.
- G. Material Certificates: Prepare written statements on manufacturer's letterhead certifying that material complies with requirements.
- H. Material Test Reports: Prepare reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting test results of material for compliance with requirements.
- I. Preconstruction Test Reports: Prepare reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of tests performed before installation of product, for compliance with performance requirements.
- J. Compatibility Test Reports: Prepare reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of compatibility tests performed before installation of product. Include written recommendations for primers and substrate preparation needed for adhesion.
- K. Field Test Reports: Prepare reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of field tests performed either during installation of product or after product is installed in its final location, for compliance with requirements.
- L. Product Test Reports: Prepare written reports indicating current product produced by manufacturer complies with requirements. Base reports on evaluation of tests performed by manufacturer and witnessed by a qualified testing agency, or on comprehensive tests performed by a qualified testing agency.
- M. Maintenance Data: Prepare written and graphic instructions and procedures for operation and normal maintenance of products and equipment. Comply with requirements in Division 1 Section "Closeout Procedures."
- N. Manufacturer's Instructions: Prepare written or published information that documents manufacturer's recommendations, guidelines, and procedures for installing or operating a product or equipment. Include name of product and name, address, and telephone number of manufacturer. Include the following, as applicable:
1. Preparation of substrates.
 2. Required substrate tolerances.

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3. Sequence of installation or erection.
 4. Required installation tolerances.
 5. Required adjustments.
 6. Recommendations for cleaning and protection.
- O. Manufacturer's Field Reports: Prepare written information documenting factory-authorized service representative's tests and inspections. Include the following, as applicable:
1. Name, address, and telephone number of factory-authorized service representative making report.
 2. Statement on condition of substrates and their acceptability for installation of product.
 3. Statement that products at Project site comply with requirements.
 4. Summary of installation procedures being followed, whether they comply with requirements and, if not, what corrective action was taken.
 5. Results of operational and other tests and a statement of whether observed performance complies with requirements.
 6. Statement whether conditions, products, and installation will affect warranty.
 7. Other required items indicated in individual Specification Sections.
- P. Insurance Certificates and Bonds: Prepare written information indicating current status of insurance or bonding coverage. Include name of entity covered by insurance or bond, limits of coverage, amounts of deductibles, if any, and term of the coverage.

2.3 SUBMITTALS TO AUTHORITIES HAVING JURISDICTION

- A. General: Provide Shop Drawings, manufacturer installation instructions, site plans, and supporting documentation as required by Authorities Having Jurisdiction (AHJ) under Section 107.2 of the applicable building code.
1. Provide transmittal of such submittals to the Architect/Engineer.
 2. Provide copies of such submittals as Information Submittals to the Architect/Engineer.

2.4 DELEGATED-DESIGN SERVICES

- A. Performance and Design Criteria: Where professional design services or certifications by a design professional are specifically required of Contractor by the Contract Documents, provide products and systems complying with specific performance and design criteria indicated.
1. If criteria indicated are not sufficient to perform services or certification required, submit written request for additional information to Architect/Engineer.
- B. Delegated-Design Services Certification: In addition to Shop Drawings, Product Data, and other required submittals, submit PDF format certification, signed and sealed by the responsible design professional licensed in the state which the project is located, for each product and system specially assigned to Contractor to be designed or certified by design professional.
1. Certify that products and systems comply with performance and design criteria in the Contract Documents. Include list of codes, loads, and other factors used in performing those services.
 2. Where necessary for manufacturer warranties, the Contractor's Design Professional shall be employed by or acceptable to the manufacturer.

PART 3 - EXECUTION

3.1 CONTRACTOR'S REVIEW

- A. Action and Informational Submittals: Review each submittal and check for coordination with other Work of the Contract and for compliance with the Contract Documents. Note corrections and field dimensions. Mark with Contractor's approval stamp before submitting to Architect/Engineer.
- B. Project Closeout and Maintenance/Material Submittals: Refer to requirements in Division 01 Section "Closeout Procedures."

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- C. Contractor's Approval Stamp: Wording shall clearly indicate the following information. Submittals with review stamps that do not meet these requirements will be rejected without review.
1. The submittal was reviewed for compliance with Contract requirements.
 2. The submittal is marked as "Approved" or "Approved As Noted" per requirements of the Conditions of the Contract.
 3. Reviewer Identification.
 4. Review date.

3.2 ARCHITECT/ENGINEER'S ACTION

- A. General: Architect/Engineer will not review submittals that do not bear Contractor's approval stamp and will return them without action.
1. Review of submittals by Architect/Engineer is only for the limited purpose of checking for conformance with information given and the design concept expressed in the Contract Documents.
 2. Review of submittals by Architect/Engineer is not for purpose of determining the accuracy and completeness of dimensions and quantities, or substantiating installation instructions.
- B. Re-Submittal Review: Submittals marked as "Revise and Resubmit" or "Rejected" require a re-submittal. The re-submittal will be reviewed and stamped with an action stamp. Architect/Engineer will mark the stamp appropriately to indicate action taken. If the re-submittal is marked as "Revise and Resubmit" or "Rejected", the Architect/Engineer will deduct the amount of the Architect's/Engineer's compensation for the third review (and any subsequent review) from the final payment to the Contractor.
- C. Re-submittal Review: Submittals marked as "Exceptions Noted – Resubmit" or "Resubmit" will be re-reviewed and stamped with an action stamp. Architect/Engineer will mark the stamp appropriately to indicate action taken. If the re-submittal is marked as "Exceptions Noted – Resubmit" or "Resubmit", the Architect/Engineer will deduct the amount of the Architect/Engineer's compensation for subsequent re-submittal review from the final payment to the Contractor as provided on the Bid Form.
- D. Action Submittals: Architect/Engineer will review each submittal, make marks to indicate corrections or modifications required, and return it. Architect/Engineer will stamp each submittal with an action stamp and will mark stamp appropriately to indicate action taken, as follows:
1. Approved: Where submittal is marked "Approved", the Work covered by the submittal may proceed provided it complies with the Contract Documents.
 2. Approved As Noted: Where submittal is marked "Approved As Noted", the Work covered by the submittal may proceed provided it complies with all Architect/Engineer's notations and corrections on the submittal and the Contract Documents.
 3. Revise and Resubmit: Where the submittal is marked "Revise and Resubmit", the Contractor may not proceed with the Work covered by the submittal, including purchasing, fabrication, delivery, or other activity for the product submitted. Revise or prepare a new submittal according to Architect/Engineer's notations and corrections.
 4. Rejected: Where the submittal is marked "Rejected", the Contractor may not proceed with the Work covered by the submittal. Prepare a new submittal that complies with the Contract Documents.
 5. Reviewed for General Conformance Only: This response is for when the Architect/Engineer is a secondary reviewer to a third party, or Architect/Engineer's stamp will demonstrate the submittal was reviewed without providing direction to the submitting entity - because the primary reviewer makes the determination regarding the acceptance of that submittal.
 6. Delegated Design - Reviewed for General Conformance Only: This response is for a special class of submittal - Delegated Design - where the Architect/Engineer is reviewing the work of a licensed professional to verify conformance with the Architect/Engineer's original design documents.
 7. Submittal Not Reviewed: Where Gresham Smith receives an informational submittal, or Gresham Smith receives a submittal we did not request, the Contractor is receiving no direction from Gresham Smith.
- E. Informational Submittals: Architect/Engineer will review each informational submittal and will not return it or may return it as a "Submittal Not Reviewed" as noted in the Section above or will return it with comments if

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it is non-responsive to requirements. Architect/Engineer has authority to designate portions of action submittals as informational.

- F. Partial submittals prepared for a portion of the Work will be reviewed only when use of partial submittals has received prior approval from Architect/Engineer.
- G. Incomplete submittals are not acceptable, will be considered nonresponsive, and will be returned without review.
- H. Submittals not required by the Contract Documents will not be reviewed and may be discarded.
- I. Submittals attached to Substitution Requests will not be reviewed and will be returned without comment.

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END OF SECTION 01 3300

**SECTION 01 4000
QUALITY REQUIREMENTS**

PART 1 GENERAL

1.1 SUMMARY

- A. This Section includes administrative and procedural requirements for quality assurance and quality control.
- B. Testing and inspecting services are required to verify compliance with requirements specified or indicated. These services do not relieve Contractor of responsibility for compliance with the Contract Document requirements.
 - 1. Specific quality-assurance and quality-control requirements for individual construction activities are specified in the Sections that specify those activities. Requirements in those Sections may also cover production of standard products.
 - 2. Specified tests, inspections, and related actions do not limit Contractor's other quality-assurance and quality-control procedures that facilitate compliance with the Contract Document requirements.
 - 3. Requirements for Contractor to provide quality-assurance and quality-control services required by Engineer, Owner, or authorities having jurisdiction are not limited by provisions of this Section.

1.2 DEFINITIONS

- A. Quality-Assurance Services: Activities, actions, and procedures performed before and during execution of the Work to guard against defects and deficiencies and substantiate that proposed construction will comply with requirements.
- B. Quality-Control Services: Tests, inspections, procedures, and related actions during and after execution of the Work to evaluate that actual products incorporated into the Work and completed construction comply with requirements. Services do not include contract enforcement activities performed by Engineer.
- C. Mockups: Full-size, physical assemblies that are constructed on-site. Mockups are used to verify selections made under sample submittals, to demonstrate aesthetic effects and, where indicated, qualities of materials and execution, and to review construction, coordination, testing, or operation; they are not Samples.
- D. Laboratory Mockups: Full-size, physical assemblies that are constructed at testing facility to verify performance characteristics.
- E. Preconstruction Testing: Tests and inspections that are performed specifically for the Project before products and materials are incorporated into the Work to verify performance or compliance with specified criteria.
- F. Product Testing: Tests and inspections that are performed by an NRTL, an NVLAP, or a testing agency qualified to conduct product testing and acceptable to authorities having jurisdiction, to establish product performance and compliance with industry standards.
- G. Source Quality-Control Testing: Tests and inspections that are performed at the source, i.e., plant, mill, factory, or shop.
- H. Field Quality-Control Testing: Tests and inspections that are performed on-site for installation of the Work and for completed Work.
- I. Testing Agency: An entity engaged to perform specific tests, inspections, or both. Testing laboratory shall mean the same as testing agency.

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- J. Installer/Applicator/Erector: Contractor or another entity engaged by Contractor as an employee, Subcontractor, or Sub-subcontractor, to perform a particular construction operation, including installation, erection, application, and similar operations.
 - 1. Using a term such as "carpentry" does not imply that certain construction activities must be performed by accredited or unionized individuals of a corresponding generic name, such as "carpenter." It also does not imply that requirements specified apply exclusively to trades-people of the corresponding generic name.
- K. Experienced: When used with an entity, "experienced" means having successfully completed a minimum of five previous projects similar in size and scope to this Project; being familiar with special requirements indicated; and having complied with requirements of authorities having jurisdiction.

1.3 CONFLICTING REQUIREMENTS

- A. General: If compliance with two or more standards is specified and the standards establish different or conflicting requirements for minimum quantities or quality levels, comply with the most stringent requirement. Refer uncertainties and requirements that are different, but apparently equal, to Engineer for a decision before proceeding.
- B. Minimum Quantity or Quality Levels: The quantity or quality level shown or specified shall be the minimum provided or performed. The actual installation may comply exactly with the minimum quantity or quality specified, or it may exceed the minimum within reasonable limits. To comply with these requirements, indicated numeric values are minimum or maximum, as appropriate, for the context of requirements. Refer uncertainties to Engineer for a decision before proceeding.

1.4 SUBMITTALS

- A. Qualification Data: For testing agencies specified in "Quality Assurance" Article to demonstrate their capabilities and experience. Include proof of qualifications in the form of a recent report on the inspection of the testing agency by a recognized authority.
- B. Schedule of Tests and Inspections: Prepare in tabular form and include the following:
 - 1. Specification Section number and title.
 - 2. Description of test and inspection.
 - 3. Identification of applicable standards.
 - 4. Identification of test and inspection methods.
 - 5. Number of tests and inspections required.
 - 6. Time schedule or time span for tests and inspections.
 - 7. Entity responsible for performing tests and inspections.
 - 8. Requirements for obtaining samples.
 - 9. Unique characteristics of each quality-control service.
- C. Reports: Prepare and submit certified written reports that include the following:
 - 1. Date of issue.
 - 2. Project title and number.
 - 3. Name, address, and telephone number of testing agency.
 - 4. Dates and locations of samples and tests or inspections.
 - 5. Names of individuals making tests and inspections.
 - 6. Description of the Work and test and inspection method.
 - 7. Identification of product and Specification Section.
 - 8. Complete test or inspection data.
 - 9. Test and inspection results and an interpretation of test results.
 - 10. Record of temperature and weather conditions at time of sample taking and testing and inspecting.
 - 11. Comments or professional opinion on whether tested or inspected Work complies with the Contract Document requirements.
 - 12. Name and signature of laboratory inspector.

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13. Recommendations on retesting and reinspecting.

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

1.5 QUALITY ASSURANCE

- A. General: Qualifications paragraphs in this Article establish the minimum qualification levels required; individual Specification Sections specify additional requirements.
- B. Installer Qualifications: A firm or individual experienced in installing, erecting, or assembling work similar in material, design, and extent to that indicated for this Project, whose work has resulted in construction with a record of successful in-service performance.
- C. Manufacturer Qualifications: A firm experienced in manufacturing products or systems similar to those indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units.
- D. Fabricator Qualifications: A firm experienced in producing products similar to those indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units.
- E. Professional Engineer Qualifications: A professional engineer who is legally qualified to practice and maintains current licensure in the state of Work, and who is experienced in providing engineering services of the kind indicated. Engineering services are defined as those performed for installations of the system, assembly, or products that are similar to those indicated for this Project in material, design, and extent.
- F. Specialists: Certain sections of the Specifications require that specific construction activities shall be performed by entities who are recognized experts in those operations. Specialists shall satisfy qualification requirements indicated and shall be engaged for the activities indicated.
1. Requirement for specialists shall not supersede building codes and regulations governing the Work.
- G. Testing Agency Qualifications: An NRTL, an NVLAP, or an independent agency with the experience and capability to conduct testing and inspecting indicated, as documented according to ASTM E 548; and with additional qualifications specified in individual Sections; and where required by authorities having jurisdiction, that is acceptable to authorities.
1. NRTL: A nationally recognized testing laboratory according to 29 CFR 1910.7.
2. NVLAP: A testing agency accredited according to NIST's National Voluntary Laboratory Accreditation Program.
- H. Factory-Authorized Service Representative Qualifications: An authorized representative of manufacturer who is trained and approved by manufacturer to inspect installation of manufacturer's products that are similar in material, design, and extent to those indicated for this Project.
- I. Preconstruction Testing: Where testing agency is indicated to perform preconstruction testing for compliance with specified requirements for performance and test methods, comply with the following:
1. Contractor responsibilities include the following:
- a. Provide test specimens representative of proposed products and construction.
- b. Submit specimens in a timely manner with sufficient time for testing and analyzing results to prevent delaying the Work.
- c. Provide sizes and configurations of test assemblies, mockups, and laboratory mockups to adequately demonstrate capability of products to comply with performance requirements.
- d. Build site-assembled test assemblies and mockups using installers who will perform same tasks for Project.

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- e. Build laboratory mockups at testing facility using personnel, products, and methods of construction indicated for the completed Work.
- f. When testing is complete, remove test specimens, assemblies, mockups, and laboratory mockups; do not reuse products on Project.
- 2. Testing Agency Responsibilities: Submit a certified written report of each test, inspection, and similar quality-assurance service to Engineer, with copy to Contractor. Interpret tests and inspections and state in each report whether tested and inspected work complies with or deviates from the Contract Documents.

1.6 QUALITY CONTROL

- A. Owner Responsibilities: Where quality-control services are indicated as Owner's responsibility, Owner will engage a qualified testing agency to perform these services.
 - 1. Owner will furnish Contractor with names, addresses, and telephone numbers of testing agencies engaged and a description of types of testing and inspecting they are engaged to perform.
 - 2. Payment for these services will be made from testing and inspecting allowances, as authorized by Change Orders.
 - 3. Costs for retesting and reinspecting construction that replaces or is necessitated by work that failed to comply with the Contract Documents will be charged to Contractor.
- B. Tests and inspections not explicitly assigned to Owner are Contractor's responsibility. Unless otherwise indicated, provide quality-control services specified and those required by authorities having jurisdiction. Perform quality-control services required of Contractor by authorities having jurisdiction, whether specified or not.
 - 1. Where services are indicated as Contractor's responsibility, engage a qualified testing agency to perform these quality-control services.
 - a. Contractor shall not employ same entity engaged by Owner, unless agreed to in writing by Owner.
 - 2. Notify testing agencies at least 24 hours in advance of time when Work that requires testing or inspecting will be performed.
 - 3. Where quality-control services are indicated as Contractor's responsibility, submit a certified written report, in duplicate, of each quality-control service.
 - 4. Testing and inspecting requested by Contractor and not required by the Contract Documents are Contractor's responsibility.
 - 5. Submit additional copies of each written report directly to authorities having jurisdiction, when they so direct.
- C. Manufacturer's Field Services: Where indicated, engage a factory-authorized service representative to inspect field-assembled components and equipment installation, including service connections. Report results in writing as specified in Division 1 Section "Submittal Procedures."
- D. Retesting/Reinspecting: Regardless of whether original tests or inspections were Contractor's responsibility, provide quality-control services, including retesting and reinspecting, for construction that replaced Work that failed to comply with the Contract Documents.
- E. Testing Agency Responsibilities: Cooperate with Engineer and Contractor in performance of duties. Provide qualified personnel to perform required tests and inspections.
 - 1. Notify Engineer and Contractor promptly of irregularities or deficiencies observed in the Work during performance of its services.
 - 2. Determine the location from which test samples will be taken and in which in-situ tests are conducted.
 - 3. Conduct and interpret tests and inspections and state in each report whether tested and inspected work complies with or deviates from requirements.
 - 4. Submit a certified written report, in duplicate, of each test, inspection, and similar quality-control service through Contractor.
 - 5. Do not release, revoke, alter, or increase the Contract Document requirements or approve or accept any portion of the Work.

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6. Do not perform any duties of Contractor.
- F. Associated Services: Cooperate with agencies performing required tests, inspections, and similar quality-control services, and provide reasonable auxiliary services as requested. Notify agency sufficiently in advance of operations to permit assignment of personnel. Provide the following:
 1. Access to the Work.
 2. Incidental labor and facilities necessary to facilitate tests and inspections.
 3. Adequate quantities of representative samples of materials that require testing and inspecting. Assist agency in obtaining samples.
 4. Facilities for storage and field-curing of test samples.
 5. Delivery of samples to testing agencies.
 6. Preliminary design mix proposed for use for material mixes that require control by testing agency.
 7. Security and protection for samples and for testing and inspecting equipment at Project site.
- G. Coordination: Coordinate sequence of activities to accommodate required quality assurance and control services with a minimum of delay and to avoid necessity of removing and replacing construction to accommodate testing and inspecting.
 1. Schedule times for tests, inspections, obtaining samples, and similar activities.
- H. Schedule of Tests and Inspections: Prepare a schedule of tests, inspections, and similar quality-control services required by the Contract Documents. Submit schedule within 30 days of date established for commencement of the Work.
 1. Distribution: Distribute schedule to Owner, Engineer, testing agencies, and each party involved in performance of portions of the Work where tests and inspections are required.
 2. Provide all required testing and inspection time within the Construction Schedule.

1.7 SPECIAL TESTS AND INSPECTION

- A. Special Tests and Inspections: Conducted by a qualified testing agency as required by authorities having jurisdiction, as indicated in individual Specification Sections, and as follows:
 1. Verifying that manufacturer maintains detailed fabrication and quality-control procedures and reviewing the completeness and adequacy of those procedures to perform the Work.
 2. Notifying Engineer and Contractor promptly of irregularities and deficiencies observed in the Work during performance of its services.
 3. Submitting a certified written report of each test, inspection, and similar quality-control service to Engineer, with copy to Contractor and to authorities having jurisdiction.
 4. Submitting a final report of special tests and inspections at Substantial Completion, that includes a list of unresolved deficiencies.
 5. Interpreting tests and inspections and stating in each report whether tested and inspected work complies with or deviates from the Contract Documents.
 6. Retesting and reinspecting corrected work.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

3.1 TEXT AND INSPECTION LOG

- A. Prepare a record of tests and inspections and provide documents to the Engineer using the Project Website in accordance with Section 01 30 00 Administrative Requirements. Include the following:
 1. Date test or inspection was conducted.
 2. Record of temperature and weather.
 3. Description of the Work tested or inspected.
 4. Date test or inspection results were transmitted to Engineer.
 5. Name of inspector.
 6. Identification of testing agency or special inspector conducting test or inspection.

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- 7. Identification of product and Specification section.
- 8. Results of test or inspection.
- B. Maintain log at Project site. Post changes and modifications as they occur. Provide access to test and inspection log for Engineer's reference during normal working hours.

3.2 REPAIR AND PROTECTION

- A. General: On completion of testing, inspecting, sample taking, and similar services, repair damaged construction and restore substrates and finishes.
 - 1. Provide materials and comply with installation requirements specified in other Specification Sections. Restore patched areas and extend restoration into adjoining areas with durable seams that are as invisible as possible.
- B. Protect construction exposed by or for quality-control service activities.
- C. Repair and protection are Contractor's responsibility, regardless of the assignment of responsibility for quality-control services.

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END OF SECTION 01 4000

**SECTION 01 4100
REGULATORY REQUIREMENTS**

PART 1 GENERAL

1.1 SUMMARY OF REFERENCE STANDARDS

- A. Regulatory requirements applicable to this project are the following:
- B. 28 CFR 35 - Nondiscrimination on the Basis of Disability in State and Local Government Services; Final Rule; Department of Justice; current edition.
- C. ADA Standards - 2010 ADA Standards for Accessible Design; 2010.
- D. FED-STD-795 - Uniform Federal Accessibility Standards (UFAS); 1988.
- E. 29 CFR 1910 - Occupational Safety and Health Standards; Current Edition.
- F. NFPA 101 - Life Safety Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
- G. Erosion and Sedimentation Control Regulations: TDEC Erosion and Sediment Control Handbook, Fourth Edition.
- H. State of Tennessee General Aquatic Resource Alteration Permits – GARAP001 and GARAP007.
- I. City of Athens, TN Stormwater Ordinance; Current Edition.
- J. NPDES General Permit for Discharges of Stormwater Associated with Construction Activities

1.2 RELATED REQUIREMENTS

- A. Section 01 4000 - Quality Requirements.

1.3 QUALITY ASSURANCE

- A. Contractor's Designer Qualifications: Refer to Section - 01 4000 - Quality Requirements.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

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END OF SECTION 01 4100

**SECTION 01 5500
VEHICULAR ACCESS AND PARKING**

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Access roads.
- B. Parking.
- C. Existing pavements and parking areas.
- D. Permanent pavements and parking facilities.
- E. Construction parking controls.
- F. Flag persons.
- G. Flares and lights.
- H. Haul routes.
- I. Traffic signs and signals.
- J. Maintenance.
- K. Removal, repair.
- L. Mud from site vehicles.

1.2 RELATED REQUIREMENTS

- A. Section 01 1000 - Summary: For access to site, work sequence, and occupancy.
- B. Section 01 5813 - Temporary Project Signage: Post Mounted and Wall Mounted Traffic Control and Informational Signs.
- C. Section 31 2200 - Grading: Specifications for earthwork and paving bases.

PART 2 PRODUCTS

2.1 MATERIALS

- A. Materials for Permanent Construction: As specified in product specification sections, including earthwork, paving base, and topping.

2.2 SIGNS, SIGNALS, AND DEVICES

- A. Post Mounted and Wall Mounted Traffic Control and Informational Signs: Specified in Section 01 5813 - Temporary Project Signage.
- B. Traffic Cones and Drums, Flares and Lights: As approved by local jurisdictions.
- C. Flag Person Equipment: As required by local jurisdictions.

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PART 3 EXECUTION

3.1 PREPARATION

- A. Clear areas, provide surface and storm drainage of road, parking, area premises, and adjacent areas.

3.2 ACCESS ROADS

- A. Use of existing on-site streets and driveways for construction traffic is permitted.
- B. Tracked vehicles not allowed on paved areas.

3.3 PARKING

- A. Use of designated areas of existing parking facilities by construction personnel is permitted.
- B. Arrange for temporary parking areas to accommodate use by construction personnel where designated areas of existing parking facilities are not available.
- C. When site space is not adequate, provide additional off-site parking.

3.4 CONSTRUCTION PARKING CONTROL

- A. Control vehicular parking to prevent interference with public traffic and parking, access by emergency vehicles, and Owner's operations.
- B. Monitor parking of construction personnel's vehicles in existing facilities. Maintain vehicular access to and through parking areas.
- C. Prevent parking on or adjacent to access roads or in non-designated areas.

3.5 FLAG PERSONS

- A. Provide trained and equipped flag persons to regulate traffic when construction operations or traffic encroach on public traffic lanes.

3.6 FLARES AND LIGHTS

- A. Use flares and lights during hours of low visibility to delineate traffic lanes and to guide traffic.

3.7 HAUL ROUTES

- A. Consult with authority having jurisdiction, establish public thoroughfares to be used for haul routes and site access.
- B. Confine construction traffic to designated haul routes.
- C. Provide traffic control at critical areas of haul routes to regulate traffic, to minimize interference with public traffic.

3.8 TRAFFIC SIGNS AND SIGNALS

- A. At approaches to site and on site, install at crossroads, detours, parking areas, and elsewhere as needed to direct construction and affected public traffic.

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- B. Relocate as work progresses, to maintain effective traffic control.

3.9 MAINTENANCE

- A. Maintain traffic and parking areas in a sound condition free of excavated material, construction equipment, products, mud, snow, and ice.
- B. Maintain existing paved areas used for construction; promptly repair breaks, potholes, low areas, standing water, and other deficiencies, to maintain paving and drainage in original, or specified, condition.

3.10 REMOVAL, REPAIR

- A. Remove underground work and compacted materials to a depth of 2 feet; fill and grade site as specified.
- B. Repair existing facilities damaged by use, to original condition.
- C. Remove equipment and devices when no longer required.
- D. Repair damage caused by installation.
- E. Remove post settings to a depth of 2 feet.

3.11 MUD FROM SITE VEHICLES

- A. Provide means of removing mud from vehicle wheels before entering streets.

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END OF SECTION 01 5500

**SECTION 01 5639
TEMPORARY TREE AND PLANT PROTECTION**

PART 1 -GENERAL

1.1 SUMMARY

- A. Section Includes: General protection and pruning of existing trees and plants affected by execution of the Work, whether temporary or permanent construction.
- B. Related Requirements:
 - 1. Section 31 1000: Removal of existing trees and shrubs.

1.2 DEFINITIONS

- A. Caliper: Diameter of a trunk measured at a height 6 inches above the ground for trees up to and including 4-inch size at this height and as measured at a height of 12 inches above the ground for trees larger than 4-inch size.
- B. Caliper (DBH): Diameter breast height; diameter of a trunk measured at a height 54 inches above the ground line.
- C. Plant-Protection Zone: Area surrounding individual trees, groups of trees, shrubs, or other vegetation to be protected during construction and indicated on Drawings.
- D. Tree-Protection Zone: Area surrounding individual trees or groups of trees to be protected during construction and [indicated on Drawings][defined by a circle concentric with each tree with a radius 1.5 times the diameter of the drip line unless otherwise indicated][defined by a circle concentric with each tree with a radius 12 times the tree's caliper size and with minimum radius of 96 inches unless otherwise indicated.
- E. Vegetation: Trees, shrubs, groundcovers, grass, and other plants.

1.3 PREINSTALLATION MEETINGS

- A. Preinstallation Conference:
 - 1. Tree-service firm's personnel, and equipment needed to make progress and avoid delays.
 - a. Arborist's responsibilities.
 - b. Quality-control program.
 - c. Coordination of Work and equipment movement with the locations of protection zones.
 - d. Trenching by hand or with air spade within protection zones.
 - e. Field quality control.

1.4 ACTION SUBMITTALS

- A. Prepare submittals per requirements of Section 01 3300 – Submittal Procedures.
- B. Product Data: For each type of product.
- C. Shop Drawings:
 - 1. Include plans, elevations, sections, and locations of protection-zone fencing and signage, showing relation of equipment-movement routes and material storage locations with protection zones.
 - 2. Detail fabrication and assembly of protection-zone fencing and signage.
 - 3. Indicate extent of trenching by hand or with air spade within protection zones.
- D. Samples: For each type of the following:

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1. Organic Mulch: 1-pint volume of organic mulch; in sealed plastic bags labeled with composition of materials by percentage of weight and source of mulch.
 2. Protection-Zone Fencing: Assembled Samples of manufacturer's standard size made from full-size components.
 3. Protection-Zone Signage: Full-size Samples of each size and text, ready for installation.
- E. Tree Pruning Schedule: Written schedule detailing scope and extent of pruning of trees to remain that interfere with or are affected by construction.
1. Species and size of tree.
 2. Location on site plan. Include unique identifier for each.
 3. Reason for pruning.
 4. Description of pruning to be performed.
 5. Description of maintenance following pruning.

1.5 INFORMATIONAL SUBMITTALS

- A. Certification: From arborist, certifying that trees indicated to remain have been protected during construction according to recognized standards and that trees were promptly and properly treated and repaired when damaged.
- B. Maintenance Recommendations: From arborist, for care and protection of trees affected by construction during and after completing the Work.
- C. Existing Conditions: Documentation of existing trees and plantings indicated to remain, which establishes preconstruction conditions that might be misconstrued as damage caused by construction activities.
1. Use sufficiently detailed photographs or video recordings.
 2. Include plans and notations to indicate specific wounds and damage conditions of each tree or other plants designated to remain.
- D. Quality-control program.

1.6 QUALITY ASSURANCE

- A. Arborist Qualifications: Certified Arborist as certified by ISA [<>].
- B. Quality-Control Program: Prepare written program to systematically demonstrate the ability of personnel to properly follow procedures and handle materials and equipment during the Work without damaging trees and plantings. Include dimensioned diagrams for placement of protection zone fencing and signage, the arborist's and tree-service firm's responsibilities, instructions given to workers on the use and care of protection zones, and enforcement of requirements for protection zones.

1.7 FIELD CONDITIONS

- A. The following practices are prohibited within protection zones:
1. Storage of construction materials, debris, or excavated material.
 2. Moving or 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.
- B. Do not direct vehicle or equipment exhaust toward protection zones.
- C. Prohibit heat sources, flames, ignition sources, and smoking within or near protection zones and organic mulch.

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PART 2 -PRODUCTS

2.1 MATERIALS

- A. Protection-Zone Fencing: Fencing fixed in position and meeting the following requirements:
 - 1. Chain-Link Protection-Zone Fencing: Galvanized-steel fencing fabricated from minimum 2-inch opening, 0.148-inch- diameter wire chain-link fabric; with pipe posts, minimum 2-3/8-inch- OD line posts, and 2-7/8-inch- OD corner and pull posts; with 1-5/8-inch- OD top rails and 0.177-inch- diameter bottom tension wire; with tie wires, hog ring ties, and other accessories for a complete fence system.
 - a. Height: 48 inches.
 - b. Polymer-Coating Color: Dark green.
 - 2. Plastic Protection-Zone Fencing: Plastic construction fencing constructed of high-density extruded and stretched polyethylene fabric with 2-inch maximum opening in pattern and weighing minimum 0.4 lb/ft.; remaining flexible from minus 60 to plus 200 deg F; inert to most chemicals and acids; minimum tensile yield strength of 2000 psi and ultimate tensile strength of 2680 psi; secured with plastic bands or galvanized-steel or stainless-steel wire ties; and supported by tubular or T-shape galvanized-steel posts spaced not more than 96 inches apart.
 - a. Height: 48 inches.
 - b. Color: High-visibility orange, nonfading.
 - 3. Gates: Single swing access gates matching material and appearance of fencing, to allow for maintenance activities within protection zones; leaf width 24 inches.
- B. Protection-Zone Signage: Shop-fabricated, rigid plastic or metal sheet with attachment holes pre-punched and reinforced; legibly printed with nonfading lettering and as follows:
 - 1. Lettering: 3-inch-high minimum, black characters on white background.

PART 3 -EXECUTION

3.1 EXAMINATION

- A. Verify that temporary erosion- and sedimentation-control measures are in place. Verify that flows of water redirected from construction areas or generated by construction activity do not enter or cross protection zones.
- B. Prepare written report, endorsed by arborist, listing conditions detrimental to tree and plant protection.

3.2 PREPARATION

- A. Locate and clearly identify trees, shrubs, and other vegetation to remain. Flag each tree trunk at 54 inches above the ground.
- B. Protect tree root systems from damage caused by runoff or spillage of noxious materials while mixing, placing, or storing construction materials. Protect root systems from ponding, eroding, or excessive wetting caused by dewatering operations.
- C. Tree-Protection Zones: Mulch areas inside tree-protection zones and other areas indicated. Do not exceed indicated thickness of mulch.
 - 1. Apply 2-inch uniform thickness of organic mulch unless otherwise indicated. Do not place mulch within 6 inches of tree trunks.

3.3 PROTECTION ZONES

- A. Protection-Zone Fencing: Install protection-zone fencing along edges of protection zones in a manner that will prevent people from easily entering protected areas except by entrance gates. Construct fencing so as not to obstruct safe passage or visibility at vehicle intersections where fencing is located adjacent to pedestrian walkways or in close proximity to street intersections, drives, or other vehicular circulation.

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1. Chain-Link Fencing: Install to comply with ASTM F 567 and with manufacturer's written instructions.
 2. Posts: Set or drive posts into ground one-third the total height of the fence without concrete footings. Where a post is located on existing paving or concrete to remain, provide appropriate means of post support acceptable to Architect/Engineer.
 3. Access Gates: Install where required; adjust 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. Protection-Zone Signage: Install protection-zone signage in visibly prominent locations in a manner approved by Architect/Engineer. Install one sign spaced approximately every 20 feet on protection-zone fencing, but no fewer than four signs with each facing a different direction.
- C. Maintain protection zones free of weeds and trash.
- D. Maintain protection-zone fencing and signage in good condition as acceptable to Architect/Engineer and remove when construction operations are complete and equipment has been removed from the site.
1. Do not remove protection-zone fencing, even temporarily, to allow deliveries or equipment access through the protection zone.
 2. Temporary access is permitted subject to preapproval in writing by arborist if a root buffer effective against soil compaction is constructed as directed by arborist. Maintain root buffer so long as access is permitted.

3.4 EXCAVATION

- A. General: Excavate at edge of protection zones and for trenches indicated within protection zones according to requirements in Section 31 2000 "Earth Moving" unless otherwise indicated.
- B. Trenching within Protection Zones: Where utility trenches are required within protection zones, excavate under or around tree roots by hand or with air spade, or tunnel under the roots by drilling, auger boring, or pipe jacking. Do not cut main lateral tree roots or taproots; cut only smaller roots that interfere with installation of utilities. Cut roots as required for root pruning. If excavating by hand, use narrow-tine spading forks to comb soil and expose roots.
- C. Redirect roots in backfill areas where possible. If encountering large, main lateral roots, expose roots beyond excavation limits as required to bend and redirect them without breaking. If encountered immediately adjacent to location of new construction and redirection is not practical, cut roots approximately 3 inches back from new construction and as required for root pruning.
- D. Do not allow exposed roots to dry out before placing permanent backfill. Provide temporary earth cover or pack with peat moss and wrap with burlap. Water and maintain in a moist condition. Temporarily support and protect roots from damage until they are permanently relocated and covered with soil.

3.5 ROOT PRUNING

- A. Prune tree roots that are affected by temporary and permanent construction. Prune roots TBD
1. Cut roots manually by digging a trench and cutting exposed roots with sharp pruning instruments; do not break, tear, chop, or slant the cuts. Do not use a backhoe or other equipment that rips, tears, or pulls roots.
 2. Cut Ends: Do not paint cut root ends.
 3. Temporarily support and protect roots from damage until they are permanently redirected and covered with soil.
 4. Cover exposed roots with burlap and water regularly.
 5. Backfill as soon as possible according to requirements in Section 31 2000 "Earth Moving."

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- B. Root Pruning at Edge of Protection Zone: Prune tree roots 12 inches outside of the protection zone by cleanly cutting all roots to the depth of the required excavation.
- C. Root Pruning within Protection Zone: Clear and excavate by hand or with air spade to the depth of the required excavation to minimize damage to tree root systems. If excavating by hand, use narrow-tine spading forks to comb soil to expose roots. Cleanly cut roots as close to excavation as possible.

3.6 CROWN PRUNING

- A. Prune branches that are affected by temporary and permanent construction. Prune branches as shown on Drawings, under direction of arborist.
 - 1. Prune to remove only broken, dying, or dead branches unless otherwise indicated. Do not prune for shape unless otherwise indicated.
 - 2. Do not remove or reduce living branches to compensate for root loss caused by damaging or cutting root system.
 - 3. Pruning Standards: Prune trees according to ANSI A300 (Part 1).
 - a. Type of Pruning: TBD where indicated.
 - b. Specialty Pruning: TBD where indicated.
- B. Unless otherwise directed by arborist and acceptable to Architect/Engineer, do not cut tree leaders.
- C. Cut branches with sharp pruning instruments; do not break or chop.
- D. Do not paint or apply sealants to wounds.
- E. Provide subsequent maintenance pruning during Contract period as recommended by arborist.
- F. Chip removed branches and spread over areas identified by Architect/Engineer.

3.7 REGRADING

- A. Lowering Grade: Where new finish grade is indicated below existing grade around trees, slope grade beyond the protection zone. Maintain existing grades within the protection zone.
- B. Lowering Grade within Protection Zone: Where new finish grade is indicated below existing grade around trees, slope grade away from trees as recommended by arborist unless otherwise indicated.
 - 1. Root Pruning: Prune tree roots exposed by lowering the grade. Do not cut main lateral roots or taproots; cut only smaller roots. Cut roots as required for root pruning.
- C. Raising Grade: Where new finish grade is indicated above existing grade around trees, slope grade beyond the protection zone. Maintain existing grades within the protection zone.
- D. Minor Fill within Protection Zone: Where existing grade is 2 inches or less below elevation of finish grade, fill with backfill soil. Place backfill soil in a single uncompacted layer and hand grade to required finish elevations.

3.8 FIELD QUALITY CONTROL

- A. Inspections: Engage qualified arborist to direct plant-protection measures in the vicinity of trees, shrubs, and other vegetation indicated to remain and to prepare inspection reports.

3.9 REPAIR AND REPLACEMENT

- A. General: Repair or replace trees, shrubs, and other vegetation indicated to remain or to be relocated that are damaged by construction operations, in a manner approved by Architect/Engineer.
 - 1. Submit details of proposed pruning and repairs.

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2. Perform repairs of damaged trunks, branches, and roots within 24 hours according to arborist's written instructions.
 3. Replace trees and other plants that cannot be repaired and restored to full-growth status, as determined by Architect/Engineer.
- B. Trees: Remove and replace trees indicated to remain that are more than 25 percent dead or in an unhealthy condition or are damaged during construction operations that Architect/Engineer determines are incapable of restoring to normal growth pattern.
1. Small Trees: Provide new trees of same size and species as those being replaced for each tree that measures 6 inches or smaller in caliper size.
 2. Large Trees: Provide one new tree of 6-inch caliper size for each tree being replaced that measures more than 6 inches in caliper size.
 3. Plant and maintain new trees as specified in Section 32 9300 "Plants."
- C. Excess Mulch: Rake mulched area within protection zones, being careful not to injure roots. Rake to loosen and remove mulch that exceeds a 2-inch uniform thickness to remain.
- D. Soil Aeration: Where directed by Architect/Engineer, aerate surface soil compacted during construction. Aerate 10 feet beyond drip line and no closer than 36 inches to tree trunk. Drill 2-inch diameter holes minimum 12 inches deep at 24 inches o.c. Backfill holes with an equal mix of augered soil and sand.

3.10 DISPOSAL OF SURPLUS AND WASTE MATERIALS

- A. Disposal: Remove excess excavated material, displaced trees, trash, and debris and legally dispose of them off Owner's property.

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END OF SECTION 01 5639

**SECTION 01 5713
TEMPORARY EROSION AND SEDIMENT CONTROL**

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Prevention of erosion due to construction activities.
- B. Prevention of sedimentation of waterways, open drainage ways, and storm and sanitary sewers due to construction activities.
- C. Restoration of areas eroded due to insufficient preventive measures.
- D. Performance bond.
- E. Compensation of Owner for fines levied by authorities having jurisdiction due to non-compliance by Contractor.

1.2 RELATED REQUIREMENTS

- A. Section 31 1000 - Site Clearing: Limits on clearing; disposition of vegetative clearing debris.
- B. Section 31 2200 - Grading: Temporary and permanent grade changes for erosion control.
- C. Section 31 3700 - Riprap: Temporary and permanent stabilization using riprap.
- D. Section 32 1120 - Aggregate Base Courses: Temporary and permanent roadways.
- E. Section 32 9219 - Seeding: Permanent turf for erosion control.
- F. Section 32 9223 - Sodding: Permanent turf for erosion control.
- G. Section 32 9300 - Plants: Permanent plantings for erosion control.

1.3 REFERENCE STANDARDS

- A. ASTM D4355/D4355M - Standard Test Method for Deterioration of Geotextiles by Exposure to Light, Moisture, and Heat in a Xenon Arc-Type Apparatus; 2021.
- B. ASTM D4491/D4491M - Standard Test Methods for Water Permeability of Geotextiles by Permittivity; 2022.
- C. ASTM D4533/D4533M - Standard Test Method for Trapezoid Tearing Strength of Geotextiles; 2015 (Reapproved 2023).
- D. ASTM D4632/D4632M - Standard Test Method for Grab Breaking Load and Elongation of Geotextiles; 2015a (Reapproved 2023).
- E. ASTM D4751 - Standard Test Methods for Determining Apparent Opening Size of a Geotextile; 2021a.
- F. ASTM D4873/D4873M - Standard Guide for Identification, Storage, and Handling of Geosynthetic Rolls and Samples; 2017 (Reapproved 2021).
- G. EPA (NPDES) - National Pollutant Discharge Elimination System (NPDES), Construction General Permit; Current Edition.

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- H. USDA TR-55 - Urban Hydrology for Small Watersheds; USDA Natural Resources Conservation Service; 2015.

1.4 PERFORMANCE REQUIREMENTS

- A. Comply with requirements of EPA (NPDES) for erosion and sedimentation control, as specified by the NPDES, for Phases I and II, and in compliance with requirements of Construction General Permit (CGP), whether the project is required by law to comply or not.
- B. Also comply with all more stringent requirements of State of Tennessee Erosion and Sedimentation Control Manual.
- C. Runoff Calculation Standard for Urban Areas: USDA TR-55.
- D. Develop and follow an Erosion and Sedimentation Prevention Plan and submit periodic inspection reports.
- E. Do not begin clearing, grading, or other work involving disturbance of ground surface cover until applicable permits have been obtained; furnish all documentation required to obtain applicable permits.
 - 1. Owner will obtain permits and pay for securities required by authority having jurisdiction.
 - 2. Owner will withhold payment to Contractor equivalent to all fines resulting from non-compliance with applicable regulations.
- F. Provide to Owner a Performance Bond covering erosion and sedimentation preventive measures only, in an amount equal to 100 percent of the cost of erosion and sedimentation control work.
- G. Timing: Put preventive measures in place as soon as possible after disturbance of surface cover and before precipitation occurs.
- H. Storm Water Runoff: Control increased storm water runoff due to disturbance of surface cover due to construction activities for this project.
 - 1. Prevent runoff into storm and sanitary sewer systems, including open drainage channels, in excess of actual capacity or amount allowed by authorities having jurisdiction, whichever is less.
 - 2. Anticipate runoff volume due to the most extreme short term and 24-hour rainfall events that might occur in 5 years.
- I. Erosion On Site: Minimize wind, water, and vehicular erosion of soil on project site due to construction activities for this project.
 - 1. Control movement of sediment and soil from temporary stockpiles of soil.
 - 2. Prevent development of ruts due to equipment and vehicular traffic.
 - 3. If erosion occurs due to non-compliance with these requirements, restore eroded areas at no cost to Owner.
- J. Erosion Off Site: Prevent erosion of soil and deposition of sediment on other properties caused by water leaving the project site due to construction activities for this project.
 - 1. Prevent windblown soil from leaving the project site.
 - 2. Prevent tracking of mud onto public roads outside site.
 - 3. Prevent mud and sediment from flowing onto sidewalks and pavements.
 - 4. If erosion occurs due to non-compliance with these requirements, restore eroded areas at no cost to Owner.
- K. Sedimentation of Waterways On Site: Prevent sedimentation of waterways on the project site, including rivers, streams, lakes, ponds, open drainage ways, storm sewers, and sanitary sewers.
 - 1. If sedimentation occurs, install or correct preventive measures immediately at no cost to Owner; remove deposited sediments; comply with requirements of authorities having jurisdiction.
 - 2. If sediment basins are used as temporary preventive measures, pump dry and remove deposited sediment after each storm.

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- L. Sedimentation of Waterways Off Site: Prevent sedimentation of waterways off the project site, including rivers, streams, lakes, ponds, open drainage ways, storm sewers, and sanitary sewers.
 - 1. If sedimentation occurs, install or correct preventive measures immediately at no cost to Owner; remove deposited sediments; comply with requirements of authorities having jurisdiction.
- M. Open Water: Prevent standing water that could become stagnant.
- N. Maintenance: Maintain temporary preventive measures until permanent measures have been established.

1.5 SUBMITTALS

- A. See Section 01 3300 for submittal procedures.
- B. Erosion and Sedimentation Control Plan:
 - 1. Submit within 2 weeks after Notice to Proceed.
 - 2. Include:
 - a. Site plan identifying soils and vegetation, existing erosion problems, and areas vulnerable to erosion due to topography, soils, vegetation, or drainage.
 - b. Measurements of existing turbidity of waterways.
 - c. Site plan showing grading; new improvements; temporary roads, traffic accesses, and other temporary construction; and proposed preventive measures.
 - d. Where extensive areas of soil will be disturbed, include storm water flow and volume calculations, soil loss predictions, and proposed preventive measures.
 - e. Schedule of temporary preventive measures, in relation to ground disturbing activities.
 - f. Other information required by law.
 - g. Format required by law is acceptable, provided any additional information specified is also included.
 - 3. Obtain the approval of the Plan by authorities having jurisdiction.
 - 4. Obtain the approval of the Plan by Owner.
- C. Certificate: Mill certificate for silt fence fabric attesting that fabric and factory seams comply with specified requirements, signed by legally authorized official of manufacturer; indicate actual minimum average roll values; identify fabric by roll identification numbers.
- D. Inspection Reports: Submit report of each inspection; identify each preventive measure, indicate condition, and specify maintenance or repair required and accomplished.
- E. Maintenance Instructions: Provide instructions covering inspection and maintenance for temporary measures that must remain after Substantial Completion.

PART 2 PRODUCTS

2.1 MATERIALS

- A. Mulch: Use one of the following:
 - 1. Straw or hay.
 - 2. Wood waste, chips, or bark.
 - 3. Erosion control matting or netting.
- B. Grass Seed For Temporary Cover: Select a species appropriate to climate, planting season, and intended purpose. If same area will later be planted with permanent vegetation, do not use species known to be excessively competitive or prone to volunteer in subsequent seasons.
- C. Bales: Air dry, rectangular straw bales.
 - 1. Cross Section: 14 by 18 inches, minimum.
 - 2. Bindings: Wire or string, around long dimension.

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- D. Bale Stakes: One of the following, minimum 3 feet long:
 - 1. Steel U- or T-section, with minimum mass of 1.33 pound per linear foot.
 - 2. Wood, 2 by 2 inches in cross section.
- E. Silt Fence Fabric: Polypropylene geotextile resistant to common soil chemicals, mildew, and insects; non-biodegradable; in longest lengths possible; fabric including seams with the following minimum average roll lengths:
 - 1. Average Opening Size: 70 U.S. Std. Sieve, maximum, when tested in accordance with ASTM D4751.
 - 2. Permittivity: 0.05 sec^{-1} , minimum, when tested in accordance with ASTM D4491/D4491M.
 - 3. Ultraviolet Resistance: Retaining at least 90 percent of tensile strength, when tested in accordance with ASTM D4355/D4355M after 500 hours exposure.
 - 4. Tensile Strength: 200 pounds-force, minimum, in cross-machine direction; 310 pounds-force, minimum, in machine direction; when tested in accordance with ASTM D4632/D4632M.
 - 5. Elongation: 20 percent max, when tested in accordance with ASTM D4632/D4632M.
 - 6. Tear Strength: 55 pounds-force, minimum, when tested in accordance with ASTM D4533/D4533M.
 - 7. Color: Manufacturer's standard, with embedment and fastener lines preprinted.
- F. Silt Fence Posts: One of the following, minimum 4.83 feet long:
 - 1. Steel U- or T-section, with minimum mass of 1.25 pound per linear foot.
- G. Gravel: See Section 32 1120 for aggregate.
- H. Riprap: See Section 31 3700.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Examine site and identify existing features that contribute to erosion resistance; maintain such existing features to greatest extent possible.

3.2 PREPARATION

- A. Schedule work so that soil surfaces are left exposed for the minimum amount of time.

3.3 SCOPE OF PREVENTIVE MEASURES

- A. In all cases, if permanent erosion resistant measures have been installed temporary preventive measures are not required.
- B. Construction Entrances: Traffic-bearing aggregate surface.
 - 1. Width: As required; 20 feet, minimum.
 - 2. Length: 100 feet, minimum.
 - 3. Provide at each construction entrance from public right-of-way.
 - 4. Where necessary to prevent tracking of mud onto right-of-way, provide wheel washing area out of direct traffic lane, with drain into sediment trap or basin.
- C. Linear Sediment Barriers: Made of silt fences.
 - 1. Provide linear sediment barriers:
 - a. Along downhill perimeter edge of disturbed areas, including soil stockpiles.
 - b. Along the top of the slope or top bank of drainage channels and swales that traverse disturbed areas.
 - c. Along the toe of cut slopes and fill slopes.
 - d. Perpendicular to flow across the bottom of existing and new drainage channels and swales that traverse disturbed areas or carry runoff from disturbed areas; space at maximum of 200 feet apart.

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- e. Across the entrances to culverts that receive runoff from disturbed areas.
- 2. Space sediment barriers with the following maximum slope length upslope from barrier:
 - a. Slope of Less Than 2 Percent: 100 feet.
 - b. Slope Between 2 and 5 Percent: 75 feet.
 - c. Slope Between 5 and 10 Percent: 50 feet.
 - d. Slope Between 10 and 20 Percent: 25 feet.
 - e. Slope Over 20 Percent: 15 feet.
- D. Storm Drain Curb Inlet Sediment Trap: Protect each curb inlet using one of the following measures:
 - 1. Filter fabric wrapped around hollow concrete blocks blocking entire inlet face area; use one piece of fabric wrapped at least 1-1/2 times around concrete blocks and secured to prevent dislodging; orient cores of blocks so runoff passes into inlet.
 - 2. Straw bale row blocking entire inlet face area; anchor into pavement.
- E. Storm Drain Drop Inlet Sediment Traps: As detailed on drawings.
- F. Temporary Splash Pads: Stone aggregate over filter fabric; size to suit application; provide at downspout outlets and storm water outlets.
- G. Soil Stockpiles: Protect using one of the following measures:
 - 1. Cover with polyethylene film, secured by placing soil on outer edges.
 - 2. Cover with mulch, at least 4 inches thickness of pine needles, sawdust, bark, wood chips, or shredded leaves, or 6 inches of straw or hay.
- H. Mulching: Use only for areas that may be subjected to erosion for less than 6 months.
 - 1. Wood Waste: Use only on slopes 3:1 or flatter; no anchoring required.
- I. Temporary Seeding: Use where temporary vegetated cover is required.

3.4 INSTALLATION

- A. Traffic-Bearing Aggregate Surface:
 - 1. Excavate minimum of 6 inches.
 - 2. Place geotextile fabric full width and length, with minimum 12 inch overlap at joints.
 - 3. Place and compact at least 6 inches of 1 1/2 to 3 1/2 inch diameter stone.
- B. Silt Fences:
 - 1. Store and handle fabric in accordance with ASTM D4873/D4873M.
 - 2. Where slope gradient is less than 3:1 or barriers will be in place less than 6 months, use nominal 16 inch high barriers with minimum 36 inch long posts spaced at 6 feet maximum, with fabric embedded at least 4 inches in ground.
 - 3. Where slope gradient is steeper than 3:1 or barriers will be in place over 6 months, use nominal 28 inch high barriers, minimum 48 inch long posts spaced at 6 feet maximum, with fabric embedded at least 6 inches in ground.
 - 4. Where slope gradient is steeper than 3:1 and vertical height of slope between barriers is more than 20 feet, use nominal 32 inch high barriers with woven wire reinforcement and steel posts spaced at 4 feet maximum, with fabric embedded at least 6 inches in ground.
 - 5. Install with top of fabric at nominal height and embedment as specified.
 - 6. Embed bottom of fabric in a trench on the upslope side of fence, with 4 inches of fabric laid flat on bottom of trench facing upslope; backfill trench and compact.
 - 7. Do not splice fabric width; minimize splices in fabric length; splice at post only, overlapping at least 18 inches, with extra post.
 - 8. Fasten fabric to steel posts using wire, nylon cord, or integral pockets.
 - 9. Wherever runoff will flow around end of barrier or over the top, provide temporary splash pad or other outlet protection; at such outlets in the run of the barrier, make barrier not more than 12 inches high with post spacing not more than 4 feet.

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- C. Straw Bale Rows:
 - 1. Install bales in continuous rows with ends butting tightly, with one bale at each end of row turned uphill.
 - 2. Install bales so that bindings are not in contact with the ground.
 - 3. Embed bales at least 4 inches in the ground.
 - 4. Anchor bales with at least two stakes per bale, driven at least 18 inches into the ground; drive first stake in each bale toward the previously placed bale to force bales together.
 - 5. Fill gaps between ends of bales with loose straw wedged tightly.
 - 6. Place soil excavated for trench against bales on the upslope side of the row, compacted.
- D. Mulching Over Large Areas:
 - 1. Dry Straw and Hay: Apply 2-1/2 tons per acre; anchor using dull disc harrow or emulsified asphalt applied using same spraying machine at 100 gallons of water per ton of mulch.
 - 2. Wood Waste: Apply 6 to 9 tons per acre.
 - 3. Erosion Control Matting: Comply with manufacturer's instructions.
- E. Mulching Over Small and Medium Areas:
 - 1. Dry Straw and Hay: Apply 4 to 6 inches depth.
 - 2. Wood Waste: Apply 2 to 3 inches depth.
 - 3. Pine Needles: Apply 2 to 3 inches depth.
 - 4. Erosion Control Matting: Comply with manufacturer's instructions.
- F. Temporary Seeding:
 - 1. When hydraulic seeder is used, seedbed preparation is not required.
 - 2. When surface soil has been sealed by rainfall or consists of smooth undisturbed cut slopes, and conventional or manual seeding is to be used, prepare seedbed by scarifying sufficiently to allow seed to lodge and germinate.
 - 3. If temporary mulching was used on planting area but not removed, apply nitrogen fertilizer at 1 pound per 1000 sq ft.
 - 4. On soils of very low fertility, apply 10-10-10 fertilizer at rate of 12 to 16 pounds per 1000 sq ft.
 - 5. Incorporate fertilizer into soil before seeding.
 - 6. Apply seed uniformly; if using drill or cultipacker seeders place seed 1/2 to 1 inch deep.
 - 7. Irrigate as required to thoroughly wet soil to depth that will ensure germination, without causing runoff or erosion.
 - 8. Repeat irrigation as required until grass is established.

3.5 MAINTENANCE

- A. Inspect preventive measures weekly, within 24 hours after the end of any storm that produces 0.5 inches or more rainfall at the project site, and daily during prolonged rainfall.
- B. Repair deficiencies immediately.
- C. Silt Fences:
 - 1. Promptly replace fabric that deteriorates unless need for fence has passed.
 - 2. Remove silt deposits that exceed one-third of the height of the fence.
 - 3. Repair fences that are undercut by runoff or otherwise damaged, whether by runoff or other causes.
- D. Straw Bale Rows:
 - 1. Promptly replace bales that fall apart or otherwise deteriorate unless need has passed.
 - 2. Remove silt deposits that exceed one-half of the height of the bales.
 - 3. Repair bale rows that are undercut by runoff or otherwise damaged, whether by runoff or other causes.
- E. Clean out temporary sediment control structures weekly and relocate soil on site.
- F. Place sediment in appropriate locations on site; do not remove from site.

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3.6 CLEAN UP

- A. Remove temporary measures after permanent measures have been installed, unless permitted to remain by Architect.
- B. Clean out temporary sediment control structures that are to remain as permanent measures.
- C. Where removal of temporary measures would leave exposed soil, shape surface to an acceptable grade and finish to match adjacent ground surfaces.

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END OF SECTION 01 5713

**SECTION 01 5813
TEMPORARY PROJECT SIGNAGE**

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Project identification sign.
- B. Project informational signs.
- C. State Water Infrastructure Grant Identification Sign

1.2 REFERENCE STANDARDS

- A. FHWA (SHS) - Standard Highway Signs and Markings; 2004, with Supplement (2012).

1.3 QUALITY ASSURANCE

- A. Design sign and structure to withstand 50 miles/hr wind velocity.
- B. Sign Painter: Experienced as a professional sign painter for minimum three years.
- C. Finishes, Painting: Adequate to withstand weathering, fading, and chipping for duration of construction.

1.4 SUBMITTALS

- A. See Section 01 3300 for submittal procedures.
- B. Shop Drawing: Show content, layout, lettering, color, foundation, structure, sizes and grades of members.

PART 2 PRODUCTS

2.1 SIGN MATERIALS

- A. Structure and Framing: New, wood, structurally adequate.
- B. Sign Surfaces: Exterior grade plywood with medium density overlay, minimum 3/4 inch thick, standard large sizes to minimize joints.
- C. Rough Hardware: Galvanized.
- D. Paint and Primers: Exterior quality, two coats.
- E. Lettering: Exterior quality paint, contrasting colors.

2.2 PROJECT IDENTIFICATION SIGN

- A. One painted sign per project site, 48 sq ft area, bottom 6 feet above ground.
- B. Content:
 - 1. Project number, title, logo and name of Owner as indicated on Contract Documents.
 - 2. Names and titles of authorities.
 - 3. Names and titles of Engineer and Consultants.
 - 4. Name of Prime Contractor and major Subcontractors.

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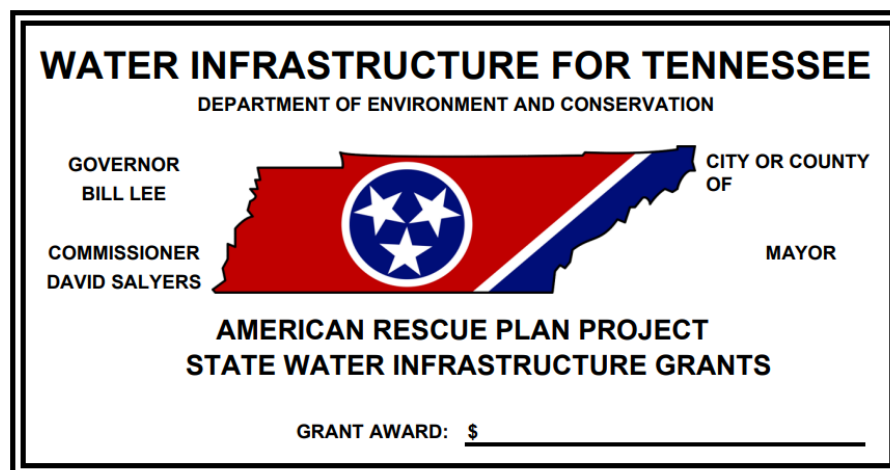
- C. Lettering: Standard Alphabet Series C, as specified in FHWA (SHS).

2.3 PROJECT INFORMATIONAL SIGNS

- A. Painted informational signs of same colors and lettering as Project Identification sign, or standard products; size lettering to provide legibility at 100 foot distance.

2.4 STATE WATER INFRASTRUCTURE GRANT IDENTIFICATION SIGN

- A. One sign shall be placed at each project site.
- B. The sign shall be a 4'0" X 8'0" sheet of exterior grade plywood and shall be built so as to remain erected during the entire construction phase of the project.
- C. The background of both sides shall be white. The lettering shall be black and shall be large enough to take advantage of the full size of the plywood. The stars shall be white set on a blue field and surrounded by a white ring placed inside a state map in red with a stripe of white and blue on the right side. The sign shall be bordered by a one-inch blue stripe.
- D. The following diagram shall be used as a design:



PART EXECUTION

10.1 INSTALLATION

- A. Install Project Identification Signs and State Water Infrastructure Grant Identification Signs within 30 days after date fixed by Notice to Proceed.
- B. Erect supports and framing on secure foundation, rigidly braced and framed to resist wind loadings.
- C. Install sign surface plumb and level, with butt joints. Anchor securely.
- D. Paint exposed surfaces of sign, supports, and framing.

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10.2 MAINTENANCE

- A. Maintain signs and supports clean, repair deterioration and damage.

10.3 REMOVAL

- A. Remove signs, framing, supports, and foundations at completion of Project and restore the area.

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END OF SECTION 01 5813

**SECTION 01 7123
FIELD ENGINEERING**

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Field engineering services by Contractor.
- B. Land surveying services by Contractor.
- C. Boundary demarcations.
- D. Construction surveying by Contractor.
- E. Time-lapse photography.

1.2 DESCRIPTION OF SERVICES

- A. Specific services listed in this section are in addition to, and do not supersede, general Execution and Closeout Requirements.
- B. Sole responsibility for establishing all locations, dimensions and levels of items of work.
- C. Sole responsibility for provision of all materials required to establish and maintain benchmarks and control points, including batter boards, grade stakes, structure elevation stakes, and other items.
- D. Keeping a transit, theodolite, or TST (total station theodolite with electronic distance measurement device); leveling instrument; and related implements such as survey rods and other measurement devices, at the project site at all times.
- E. Provision of facilities and assistance necessary for Architect/Engineer to check lines and grade points placed by Contractor.
 - 1. Performance of excavation or embankment work until after all cross-sectioning necessary for determining payment quantities for Unit Price work have been completed and accepted by Architect/Engineer.
- F. Preparation and maintenance of daily reports of activity on the work. Submission of reports containing key progress indicators and job conditions to Architect/Engineer.
 - 1. Major equipment and materials installed as part of the work.
 - 2. Major construction equipment utilized.
 - 3. Location of areas in which construction was performed.
 - 4. Work performed, including field quality control measures and testing.
 - 5. Weather conditions.
 - 6. Delays encountered, amount of delay incurred, and the reasons for the delay.
 - 7. Instructions received from Architect/Engineer or Owner, if any.
- G. Preparation and maintenance of professional-quality, accurate, well organized, legible notes of all measurements and calculations made while surveying and laying out the work.
- H. Prior to backfilling operations, surveying - locating, and recording on a copy of Contract Documents - an accurate representation of buried work and Underground Facilities encountered.
- I. Setting up and executing time-lapse photography of construction activities.

1.3 REFERENCE STANDARDS

- A. FGDC-STD-007.1 - Geospatial Positioning Accuracy Standards - Part 1: Reporting Methodology; 1998.
- B. FGDC-STD-007.2 - Geospatial Positioning Accuracy Standards - Part 2: Standards for Geodetic Networks; 1998.
- C. FGDC-STD-007.4 - Geospatial Positioning Accuracy Standards - Part 4: Architecture, Engineering, Construction, and Facilities Measurement; 2002.
- D. State Plane Coordinate System for the State in which the Project is located.

1.4 SUBMITTALS

- A. See Section 01 3300 for submittal procedures.
- B. Submit in addition to items required in Section 01-7700 Closeout Requirements.
- C. Informational Submittals: Submit the following:
 - 1. Field Engineering: Submit daily reports, with content as indicated in this section.
 - a. When requested by Architect/Engineer, submit for Record documentation verifying accuracy of field engineering including, but not limited to, Contractor's survey notes and field notes.
 - 2. Final property survey.

1.5 QUALITY ASSURANCE

- A. Field Engineer's Qualifications: As established in Section 01-7700 Closeout Requirements.
- B. Land Surveyor's Qualifications: As established in Section 01-7700 Closeout Requirements.
- C. Use adequate number of skilled and thoroughly trained workers to perform the work of this section in a timely and comprehensive manner.
- D. Minimum accuracy for required work is as follows:
 - 1. Grade: Horizontal Tolerance: Plus or minus 0.5 feet, Vertical Tolerance: Plus or minus 0.05 feet.
 - 2. Culverts and ditches: Horizontal Tolerance: Plus or minus 0.5 feet, Vertical Tolerance: Plus or minus 0.05 feet.
 - 3. Structures: Horizontal Tolerance: Plus or minus 0.5 feet (location), Vertical Tolerance: Plus or minus 0.05 feet.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify layout information shown on drawings in relation to property survey and existing benchmarks.
- A. Notify Owner's representative and Architect/Engineer of discrepancies immediately in writing before proceeding to lay out work.
- B. Locate and protect existing benchmarks, base lines, and demarcations. Preserve permanent reference points during construction.
- C. Existing Utilities and Equipment: The existence and location of underground and other utilities and construction indicated as existing are not guaranteed. Before beginning sitework, investigate and verify existing conditions.

3.2 FIELD ENGINEERING

- A. Maintain field office files, drawings, specifications, and record documents.
- B. Coordinate field engineering services with Contractor's subcontractors, installers, and suppliers as appropriate.
- C. Prepare layout and coordination drawings for construction operations.
- D. Check and coordinate the work for conflicts and interferences, and immediately advise Architect/Engineer and Owner of all discrepancies of which Contractor is aware.
- E. Cooperate as required with Architect/Engineer and Owner in observing the work and performing field inspections.
- F. Review and coordinate work on a regular basis with shop drawings and Contractor's other submittals.
- G. In general, match existing adjacent grades and maintain existing flow lines.
- H. Check the location, line and grade of every major element as the work progresses. Notify the Architect/Engineer when deviations from required lines or grades exceed allowable tolerances. Include in such notifications a thorough explanation of the problem, and a proposed plan and schedule for remedying the deviation. Do not proceed with remedial work without Owner's concurrence of the remediation plan.
- I. Check all formwork, reinforcing, inserts, structural steel, bolts, sleeves, piping, other materials and equipment for compliance with shop drawings and Contract Documents requirements.

3.3 LAND SURVEYING

- A. General: Follow standards for geospatial positioning accuracy.
 - 1. FGDC-STD-007.1 as amended by Authority Having Jurisdiction.
 - 2. FGDC-STD-007.2 as amended by Authority Having Jurisdiction.
 - 3. FGDC-STD-007.4 as amended by Authority Having Jurisdiction.
- B. Coordinate survey data with the State Plane Coordinate System of the State in which the Project is located.
- C. Contractor is responsible for the restoration of all property corners and control monuments damaged or destroyed by construction-related activities. Any disturbed monuments must be replaced at Contractor's expense by a surveyor licensed in the State in which the Project is located and approved by the Architect/Engineer.
 - 1. Temporarily suspend work at such points and for such reasonable times as the Owner may require for resetting monuments. The Contractor will not be entitled to any additional compensation or extension of time.

3.4 CONSTRUCTION SURVEYING

- A. General: Perform surveying as applicable to specific items necessary for proper execution of work.
 - 1. Alignment Staking: Provide alignment stakes at 50 foot intervals on tangent, and at 25 foot intervals on curves.
 - 2. Slope Staking: Provide slope staking at 50 foot intervals on tangent, and at 25 foot intervals on curves. Re-stake at every ten-foot difference in elevation.
 - 3. Structure: Stake out structures, including elevations, and check prior to and during construction.
 - 4. Pipelines: Stake out pipelines including elevations, and check prior to and during construction.
 - 5. Site Utilities: Stake out utility lines including elevations, and check prior to and during construction.
 - 6. Road/Sidewalk: Stake out elevations at 50 foot intervals on tangent, and at 25 foot intervals on curves.
 - 7. Cross-sections: Provide original, intermediate, and final staking as required, for site work and other locations as necessary for quantity surveys.

- B. Surveying to Determine Quantities for Payment.
 - 1. For each application for progress payment, perform such surveys and computations necessary to determine quantities of work performed or placed. Perform surveys necessary for Architect/Engineer to determine final quantities of work in place.
 - 2. Notify Architect/Engineer at least 24 hours before performing survey services for determining quantities. Unless waived in writing by Architect/Engineer, perform quantity surveys in presence of Architect/Engineer.
- C. Record Log: Maintain a log of layout control work. Record any deviations from required lines and levels. Include beginning and ending dates and times of surveys, weather conditions, name and duty of each survey party member, and types of instruments and tapes used.
- D. Use by the Architect/Engineer: The Architect/Engineer may at any time use line and grade points and markers established by the Contractor. The Contractor's surveys are a part of the work and may be checked by the Architect/Engineer at any time.
- E. Accuracy:
 - 1. Establish Contractor's temporary survey references points for Contractor's use to at least second-order accuracy (e.g., 1:10000). Set construction staking used as a guide for the work to at least third-order accuracy (e.g., 1:5000). Provide the absolute margin for error specified below on the basis established by such orders.
 - a. Horizontal Accuracy of Easement Staking: Plus/minus 0.1 foot.
 - b. Accuracy of Other Staking: Plus/minus 0.04 foot horizontally and plus/minus 0.02 foot vertically.
 - c. Include an error analysis sufficient to demonstrate required accuracy in survey calculations.
 - 2. Owner reserves the right to check the Contractor's survey, measurements, and calculations. The requirement for accuracy will not be waived, whether this right is exercised or not.

3.5 REPORTS

- A. Submit two copies of Contractor's daily reports at Architect's/Engineers field office (or electronically) by 9:00 AM the next working day after the day covered in the associated report. Daily report shall be signed by responsible member of Contractor's staff, such as project manager or superintendent, or foreman designated by Contractor as having authority to sign daily reports.

3.6 RECORDS

- A. Maintain at the Site a complete and accurate log of control and survey work as it progresses.
 - 1. Organize and record survey data in accordance with recognized professional surveying standards, Laws and Regulations, and prevailing standards of practice in the State in which the Project is located. Record Contractor's surveyor's original field notes, computations, and other surveying data in Contractor-furnished hard-bound field books. Contractor is solely responsible for completeness and accuracy of survey work, and completeness and accuracy of survey records, including field books. Survey records, (including field books) may be rejected by Owner due to failure to organize and maintain survey records in a manner that allows reasonable and independent verification of calculations, and/or allows identification of elevations, dimensions, and grades of the work.
 - 2. Illegible notes or data, and erasures on any page of field books, are unacceptable. Do not submit copied notes or data. Corrections by ruling or lining out errors will be unacceptable unless initialed by the surveyor. Violation of these requirements may require re-surveying the data questioned by Architect/Engineer.
- B. Submit three copies of final property survey to Owner. Include on the survey a certification, signed by the surveyor, that principal metes, bounds, lines, and levels of the Project are accurately positioned as shown on the survey. Include the following information:
 - 1. Structure locations from property lines, and distances to adjacent buildings.
 - 2. Dimensions and locations of drives, walks, walls, underground utilities, appurtenances, and major site features.
 - 3. Location of easements.

4. Final grading topographic survey.

3.7 CLOSEOUT ACTIVITIES

- A. See Section 01 7800 - Closeout Submittals, for closeout submittals.

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END OF SECTION 01 7123

**SECTION 01 7419
CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL (SHORT FORM)**

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Construction waste management plan.
 - 2. Construction waste recycling.
 - 3. Construction waste adaptive reuse.

1.2 PLAN REQUIREMENTS

- A. Develop and implement a construction waste management plan as approved by Owner.
- B. Implement construction waste management plan at start of construction.
- C. Review construction waste management plan at preconstruction meeting and progress meetings
- D. Intent:
 - 1. Divert construction, demolition, and land-clearing debris from landfill disposal.
 - 2. Redirect recyclable material back to manufacturing process.
 - 3. Generate cost savings or increase minimal additional cost to Project for waste disposal.
- E. Purchase products to prevent waste by:
 - 1. Ensuring correct quantity of each material is delivered to Site.
 - 2. Choosing products with minimal or no packaging.
 - 3. Requiring suppliers to use returnable pallets or containers.
 - 4. Requiring suppliers to take or buy back rejected or unused items.

1.3 INFORMATION SUBMITTALS

- A. Construction Waste Management Plan: Submit construction waste management plan describing methods and procedures for implementation and monitoring compliance including the following:
 - 1. Transportation company hauling construction waste to waste processing facilities.
 - 2. Recycling and adaptive reuse processing facilities and waste type each facility will accept.
 - 3. Construction waste materials anticipated for recycling and adaptive reuse.
 - 4. On-Site sorting and Site storage methods.

1.4 CONSTRUCTION WASTE RECYCLING

- A. Use source separation method or comingling method suitable to sorting and processing method of selected recycling center. Dispose non-recyclable trash separately into landfill.
- B. Source Separation Method: Recyclable materials separated from trash and sorted into separate bins or containers, identified by waste type, before transportation to recycling center.
- C. Comingling Method: Recyclable materials separated from trash and placed in unsorted bins or container for sorting at recycling center.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

3.1 CONSTRUCTION WASTE COLLECTION

- A. Collect construction waste materials in marked bins or containers and arrange for transportation to recycling centers or adaptive salvage and reuse processing facilities.
- B. Maintain recycling storage and collection area in orderly arrangement with materials separated to eliminate co-mingling of materials required to be delivered separately to waste processing facility.
- C. Store construction waste materials to prevent environmental pollution, fire hazards, hazards to persons and property, and contamination of stored materials.
- D. Cover construction waste materials subject to disintegration, evaporation, settling, or runoff to prevent polluting air, water, and soil.

3.2 CONSTRUCTION WASTE DISPOSAL

- A. Deliver construction waste to waste processing facilities. Obtain receipts for deliveries.
- B. Dispose of construction waste not capable of being recycled or adaptively reused by delivery to landfill, incinerator, or other legal disposal facility. Obtain receipts for deliveries.
- C. Remove and transport waste in a manner that will prevent spillage on adjacent surfaces and areas.
- D. Burning: Do not burn waste materials on site.
- E. Waste removed from the Project site shall be disposed of in sites permitted by the Federal, State, and Local agencies having jurisdiction for the acceptance of type of waste being disposed. The acceptable types of permitted disposal facilities are as follows:
 - 1. Inert Waste Landfills
 - 2. Municipal Solid Waste Landfills
 - 3. Municipal Solid Waste Landfills permitted to receive only construction and demolition wastes.
- F. Exceptions to Paragraph E are as follows:
 - 1. Hazardous waste shall be disposed of in accordance with Federal, State, and Local agencies having jurisdiction.
 - 2. Asbestos-containing waste shall also be handled and disposed of in accordance with Federal, State, and Local agencies having jurisdiction.
 - 3. Excess earth material and excess excavated rock material may be placed on sites for which the Contractor provides to the Owner a signed affidavit from the property owner that the placement of such material is acceptable to the property owner. The Contractor and property owner shall be responsible for all permitting of such disposal.

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END OF SECTION 01 7419

**SECTION 01 7700
CLOSEOUT REQUIREMENTS**

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Substantial Completion procedures.
 - 2. Final completion procedures.
 - 3. Warranties.
 - 4. Final cleaning.
 - 5. Repair of the Work.
- B. Related Requirements:
 - 1. Section 01 20 00, Measurement and Payment.
 - 2. Section 01 31 00, Project Management and Coordination.
 - 3. Section 01 32 00, Construction Progress Documentation.
 - 4. Section 01 33 00, Submittal Procedures.
 - 5. Section 01 78 00, Operation and Maintenance Data.
 - 6. Section 01 78 10, Project Record Documents.
 - 7. Section 01 81 00, Equipment Testing and Startup.
 - 8. Section 01 82 00, Demonstration and Training.

1.2 ACTION SUBMITTALS

- A. Contractor's Punch List of Incomplete Items: Initial submittal at Substantial Completion.
- B. Certified Punch List of Incomplete Items: Final submittal at Final Completion.

1.3 CLOSEOUT SUBMITTALS

- A. Certificates of Release: From authorities having jurisdiction.
- B. Certificate of Insurance: For continuing coverage.
- C. Warranty Certificates for all equipment.

1.4 MAINTENANCE MATERIAL SUBMITTALS

- A. Schedule of Maintenance Material Items: For maintenance material submittal items specified in other Sections.

1.5 SUBSTANTIAL COMPLETION PROCEDURES

- A. Contractor's List of Incomplete Items: Prepare and submit a list of items to be completed and corrected (Contractor's punch list), indicating the value of each item on the list and reasons why the Work is incomplete.
- B. Submittals Before Substantial Completion: Complete the following minimum 10 days before requesting inspection for determining date of Substantial Completion. List items below that are incomplete at time of request.
 - 1. Certificates of Release: Obtain and submit releases from authorities having jurisdiction permitting Owner unrestricted use of the Work and access to services and utilities. Include occupancy permits, operating certificates, and similar releases.

2. Submit closeout submittals specified in other Division 01 Sections, including project record documents, operation and maintenance manuals, final completion construction photographic documentation, damage or settlement surveys, property surveys, and similar final record information.
 3. Submit closeout submittals specified in individual Sections, including specific warranties, workmanship bonds, maintenance service agreements, final certifications, and similar documents.
 4. Submit maintenance material submittals specified in individual Sections, including tools, spare parts, extra materials, and similar items, and deliver to location designated by Engineer. Label with manufacturer's name and model number where applicable.
 5. Submit test/adjust/balance records.
 6. Submit record drawings, final project photographs, damage or settlement surveys, property surveys, and similar final record information.
- C. Procedures Before Substantial Completion: Complete the following minimum 10 days before requesting inspection for determining date of Substantial Completion. List items below that are incomplete at time of request.
1. Advise Owner of pending insurance changeover requirements.
 2. Participate with Owner in conducting inspection and walkthrough with local emergency responders.
 3. Terminate and remove temporary facilities from Project site, along with mock-ups, construction tools, and similar elements.
 4. Complete final cleaning requirements, including touchup painting.
 5. Touch up and otherwise repair and restore marred exposed finishes to eliminate visual defects.
- D. Inspection: Submit a written request for inspection to determine Substantial Completion minimum 10 days before date the work will be completed and ready for final inspection and tests. On receipt of request, Engineer will either proceed with inspection or notify Contractor of unfulfilled requirements. Engineer will prepare the Certificate of Substantial Completion after inspection or will notify Contractor of items, either on Contractor's list or additional items identified by Engineer, that must be completed or corrected before certificate will be issued.
1. Reinspection: Request reinspection when the Work identified in previous inspections as incomplete is completed or corrected.
 2. Results of completed inspection will form the basis of requirements for final completion.
 3. If necessary, reinspection will be repeated at additional cost to the Contractor.

1.6 FINAL COMPLETION PROCEDURES

- A. Submittals Before Final Completion: Before requesting final inspection for determining final completion, complete the following:
1. Submit final Application for Payment.
 2. Certified List of Incomplete Items: Submit certified copy of Engineer's Substantial Completion inspection list of items to be completed or corrected (punch list), endorsed and dated by Engineer. Certified copy of the list shall state that each item has been completed or otherwise resolved for acceptance.
 3. Certificate of Insurance: Submit evidence of final, continuing insurance coverage complying with insurance requirements.
- B. Inspection: Submit a written request for final inspection to determine acceptance minimum 10 days before date the work will be completed and ready for final inspection and tests. On receipt of request, Engineer will either proceed with inspection or notify Contractor of unfulfilled requirements. Engineer will prepare a final Certificate for Payment after inspection or will notify Contractor of construction that must be completed or corrected before certificate will be issued.
1. Reinspection: Request reinspection when the Work identified in previous inspections as incomplete is completed or corrected.
 2. If necessary, reinspection will be repeated at additional cost to the Contractor.

1.7 LIST OF INCOMPLETE ITEMS (PUNCH LIST)

- A. Organization of List: Include name and identification of each space and area affected by construction operations for incomplete items and items needing correction including, if necessary, areas disturbed by Contractor that are outside the limits of construction
 - 1. Include the following information at the top of each page:
 - a. Project name.
 - b. Name of Engineer.
 - c. Name of Contractor.
 - d. Page number.
 - 2. Submit list of incomplete items in the following format:
 - a. MS Excel electronic file and a PDF electronic file. Engineer will return annotated Excel file.

1.8 SUBMITTAL OF PROJECT WARRANTIES

- A. Time of Submittal: Submit written warranties on request of Engineer for designated portions of the Work where commencement of warranties other than date of Substantial Completion is indicated, or when delay in submittal of warranties might limit Owner's rights under warranty.
- B. Partial Occupancy: Submit properly executed warranties within 15 days of completion of designated portions of the Work that are completed and occupied or used by Owner during construction period by separate agreement with Contractor.
- C. Organize warranty documents into an orderly sequence based on the table of contents of Project Manual.
 - 1. Bind warranties and bonds in heavy-duty, three-ring, vinyl-covered, loose-leaf binders, thickness as necessary to accommodate contents, and sized to receive 8-1/2-by-11-inch paper.
 - 2. Provide heavy paper dividers with plastic-covered tabs for each separate warranty. Mark tab to identify the product or installation. Provide a typed description of the product or installation, including the name of the product and the name, address, and telephone number of Installer.
 - 3. Identify each binder on the front and spine with the typed or printed title "WARRANTIES," Project name, and name of Contractor.
 - 4. Warranty Electronic File: Scan warranties and bonds and assemble complete warranty and bond submittal package into a single indexed electronic PDF file with links enabling navigation to each item. Provide bookmarked table of contents at beginning of document.
- D. Provide additional copies of each warranty to include in operation and maintenance manuals.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

3.1 FINAL CLEANING

- A. General: Perform final cleaning. Conduct cleaning and waste-removal operations to comply with local laws and ordinances and Federal and local environmental and antipollution regulations.
- B. Complete the following cleaning operations before requesting inspection for certification of Substantial Completion for entire Project or for a designated portion of Project:
 - 1. Clean Project site, yard, and grounds, in areas disturbed by construction activities, including landscape development areas, of rubbish, waste material, litter, and other foreign substances.
 - 2. Sweep paved areas broom clean. Remove petrochemical spills, stains, and other foreign deposits.
 - 3. Rake grounds that are neither planted nor paved to a smooth, even-textured surface.
 - 4. Remove tools, construction equipment, machinery, and surplus material from Project site.
 - 5. Remove debris and surface dust from limited access spaces, including trenches, equipment vaults, manholes, and similar spaces.
 - 6. Remove labels that are not permanent.
 - 7. Leave Project clean and ready for occupancy.

- C. Construction Waste Disposal: Comply with Owner's requirements and local, State, and Federal requirements for waste disposal.

3.2 REMOVAL OF PROTECTION

- A. Remove temporary site security, protection and facilities.

3.3 REPAIR OF THE WORK

- A. Complete repair and restoration operations before requesting inspection for determination of Substantial Completion.
- B. Repair or remove and replace defective construction. Repairing includes replacing defective parts, refinishing damaged surfaces, touching up with matching materials, and properly adjusting operating equipment. Where damaged or worn items cannot be repaired or restored, provide replacements. Remove and replace operating components that cannot be repaired. Restore damaged construction and permanent facilities used during construction to specified condition.

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END OF SECTION 01 7700

**SECTION 01 7800
CLOSEOUT SUBMITTALS**

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Project record documents, as required by the Architect/Engineer executed Agreement with the Client.
- B. Operation and Maintenance Documentation Directory and Data.
- C. Warranties and bonds.

1.2 RELATED REQUIREMENTS

- A. Section 00 7200 - General Conditions and 00 7300 - Supplementary Conditions: Performance bond and labor and material payment bonds, warranty, and correction of work.
- B. Section 01 3100 - Project Management and Coordination: Submittals procedures, shop drawings, product data, and samples.
- C. Section 01 5000 - Temporary Facilities and Controls: Construction Waste Disposal procedures.
- D. Section 01 7000 - Execution and Closeout Requirements: Contract closeout procedures.
- E. Individual Product Sections: Specific requirements for operation and maintenance data.
- F. Individual Product Sections: Warranties required for specific products or Work.

1.3 SUBMITTALS

- A. Project Record Documents are to be submitted to the Architect/Engineer through Newforma Info Exchange. Upon review, Architect/Engineer will notify and return comments to Contractor. If no comments are generated, Architect/Engineer will notify Contractor, who will deliver Record Documents to Owner.
- B. Project Record Documents: Submit documents to Architect/Engineer with claim for final Application for Payment.
 - 1. Record Drawings, as defined by the executed Agreement:
 - a. Submit one set of marked-up record drawings.
 - b. Photographs and/or photographic reproductions of drawings are not acceptable.
 - c. Submit record digital data files as one set of marked-up record drawings.
 - 1) Architect/Engineer will indicate whether general scope of changes, additional information recorded and quality of mark-ups are acceptable.
 - 2. Record Specifications: Submit annotated PDF electronic files of Project Manual and Specifications, including addenda and contract modifications.
 - 3. Miscellaneous Record Submittals: See other Sections for miscellaneous record-keeping requirements and submittals in connection with construction activities. Submit annotated PDF electronic files and directories of each submittal.
 - a. A certificate and drawings, from surveyor licensed in State where project is located, verifying that installed ramp slopes are not greater than slopes indicated on project documents and that widths and lengths of ramps indicated are not less than minimum dimensions required by the governing codes and DOJ 2010 ADA Standards for Accessible Design.
- C. Operation and Maintenance Documentation Directory and Data:
 - 1. Submit two copies of preliminary draft of proposed formats and outlines of Directory before start of Work. Architect/Engineer will review draft and return one copy with comments.

- a. Electronic File: Scan documents into a single, indexed, electronic PDF file with links enabling navigation to each item. Provide bookmarked Table of Contents as the first page.
 2. For equipment, of component parts of equipment, put into service during construction and operated by Owner, submit completed operations and documentation directory with ten days after acceptance.
 3. Submit one copy of completed documents 15 days prior to final inspection. This copy will be reviewed and returned, with Architect/Engineer comments. Revise content of all document sets as required for final submission.
 4. Submit two sets of revised final documents in the approved format within 10 days after final inspection.
 5. Schedule of Maintenance Material Items: For maintenance material submittal items specified in other Sections.
 6. Submit maintenance materials submittals specified in individual Sections, including tools, spare parts, extra materials and similar items; deliver to location designated by the Architect/Engineer. Label with manufacturer's name and model number, where applicable.
 7. Submit change over information related to Owner's occupancy, use, operation and maintenance.
 8. Provide copies of applicable warranties with each applicable submittal item.
- D. Warranties and Bonds:
1. For equipment or component parts of equipment put into service during construction with Owner's permission, submit documents within 10 days after acceptance.
 2. Make other submittals within 10 days after Date of Substantial Completion, prior to final Application for Payment.
 3. For items of Work for which acceptance is delayed beyond Date of Substantial Completion, submit within 10 days after acceptance, listing the date of acceptance as the beginning of the warranty period.
 4. Time of Submittal: Submit written warranties on request of the Architect/Engineer for designated portions of the Work where commencement of warranties other than date of Substantial Completion is indicated or when delay in submittal of warranties might limit Owner's rights under warranty.
 5. Partial Occupancy: Submit properly executed warranties within 15 working days of completion of designated portions of the Work that are completed and occupied or used by Owner during construction period or by separate agreement with Owner.
 6. Organize warranty documents into an orderly sequence based on the Project Manual Table of Contents.
 - a. Warranty Electronic File: Scan warranties and bonds and assemble complete warranty and bond submittal package into a single, indexed, electronic PDF file with links enabling navigation to each item. Provide bookmarked Table of Contents as the first page.
 7. Provide additional copies of warranties in Operation and Maintenance Manuals.
- E. Closeout Submittals:
1. Submit closeout submittals specified in individual Sections, including specific warranties, workmanship bonds, maintenance service agreements, final certifications and similar documents.
 2. Submit sustainable design documents as required by the selected certification program in Division 01 and in individual Sections.
- F. Certificate of Insurance: For continuing coverage during the Contractor Warranty period.
- G. Submit termite inspection and/or pest control field inspection report.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.1 PROJECT RECORD DOCUMENTS

- A. Compile all required documents into an electronic database for Owner's use, with data that is indexed and bookmarked in the same sequence as, and identified by the Project Manual Specification Sections and by discipline, in same order as the Sheet Index.
 1. Provide data base to Owner on a flash drive or electronically transmit directly to Owner, after Architect/Engineer review.

**MAYFIELD REGIONAL DETENTION
REGIONAL PARK DREDGING AND STABILIZATION
COOK DRIVE POND IMPROVEMENTS
ATHENS, TENNESSEE
Gresham Smith Project No.: 46762.02**

- B. Maintain on site one set of the following record documents; record actual revisions to the Work. At Contractor's option, revision information may be recorded electronically on PDF files of Contract Documents:
 - 1. Drawings.
 - 2. Specifications.
 - 3. Addenda.
 - 4. Change Orders and other modifications to the Contract. Note number of Construction Change Directives, Architect's Supplemental Information issuances, Work Change Directives, Change Orders, accepted Alternates and similar modifications.
 - 5. Reviewed shop drawings, product data, and samples.
 - 6. Manufacturer's instruction for assembly, installation, and adjusting.
 - 7. Mark important additional information as necessary to provide Owner with clear documentation.
- C. Ensure entries are complete and accurate, enabling future reference by Owner.
- D. Store record documents separate from documents used for construction.
- E. Record information concurrent with construction progress.
- F. Specifications: Legibly mark and record at each product section description of actual products installed, including the following:
 - 1. Manufacturer's name and product model and number.
 - 2. Product substitutions or alternates utilized.
 - 3. Changes made by Addenda and modifications.
- G. Record Drawings: Legibly mark each item to record actual construction including:
 - 1. Measured depths of foundations in relation to Base Survey Elevation (BSE).
 - 2. Measured horizontal and vertical locations of underground utilities and appurtenances, referenced to permanent surface improvements.
 - 3. Field changes of dimension and detail.
 - 4. Details not on original Contract drawings.
 - 5. Content: Types of items requiring marking include, but are not limited to, the following:
 - a. Dimensional changes to Drawings.
 - b. Revisions to details shown on Drawings:
 - c. Locations and depths of underground utilities.
 - d. Revisions to routing of piping and conduits.
 - e. Actual equipment locations.
 - f. Changes made by Change Order or Construction Change Directives.
 - g. Changes made following Architect/Engineer written orders.
 - h. Details not on the original Contract Drawings.
 - i. Field records for variable and concealed conditions.
- H. Record Digital Data Files: Immediately before inspection for Certificate of Substantial Completion, review marked-up record prints with Architect/Engineer. When authorized, prepare a full set of corrected digital data files of the Contract Drawings as follows:
 - 1. Format: Same digital data software program, version and operating system as the original Contract Drawings.
 - 2. Format: Annotated PDF electronic file.
 - 3. Incorporated changes and additional information previously marked on record prints. Delete, redraw and add details and notations where applicable.
 - 4. Refer instances of uncertainty to Architect/Engineer for resolution.
 - 5. Architect/Engineer will supply Contractor one set of digital data files of the Contract Drawings for use in recording information.
 - a. See Section 01 3300 Submittal Procedures for requirements related to use of Architect/Engineer's digital data files.
- I. Format: Identify and date each Record Drawing; include the designation "PROJECT RECORD DRAWING" in the title block of each drawing.

1. Record Prints: Organize record prints and newly prepared Record Drawings into manageable sets. Bind each set with durable paper cover sheets. Include identification on cover sheets.
2. Format Annotated PDF electronic file.
3. Record Digital Data Files: Organize digital data information into separate electronic files that correspond to each sheet of the Contract Drawings. Name each file with the sheet identification. Include identification in each digital data file.
4. Identification: As follows:
 - a. Project Name.
 - b. Date.
 - c. Designation "PROJECT RECORD DRAWINGS".
 - d. Name of Architect/Engineer.
 - e. Name of Contractor.

3.2 RECORD SPECIFICATIONS

- A. Preparation: Mark Specifications to indicate the actual product installation where installation varies from that indicated in Specifications, addenda and contract modifications.
 1. Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.
 2. Mark copy with proprietary name and model number of products, material and equipment provided, including substitutions and product options selected.
 3. Record the name of the manufacturer, supplier, installer and other information necessary to provide a record of selections made.
 4. For each principal product, indicate whether record Product Data has been submitted in operation and maintenance manuals instead of submitted as record Product Data.
 5. Note related Change Orders and Record Drawings where applicable.
 6. Format: Submit record Specifications as annotated PDF electronic files.

3.3 MISCELLANEOUS RECORD SUBMITTALS

- A. Assemble miscellaneous records required by other Sections for miscellaneous record keeping and submittal in connection with actual performance of the Work. Bind of file miscellaneous records and identify each, ready for continued use and reference.
- B. Format: Submit miscellaneous record submittals as annotated PDF electronic files.
 1. Include miscellaneous record submittals directory organized by Section number and title, electronically linked to each item of miscellaneous record submittals.

3.4 OPERATION AND MAINTENANCE DOCUMENTATION DIRECTORY AND DATA

- A. Directory: Prepare a single, comprehensive directory of emergency, operation and maintenance data and materials, listing items and their location to facilitate ready access to desired information. Include a section for each of the following:
 1. Table of Contents
 2. List of Documents
 3. List of Systems.
 4. List of Equipment.
- B. Table of Contents: Include Table of Contents for each emergency, operation and maintenance manual.
- C. List of Systems and Subsystems: List systems alphabetically. Include reference to operation and maintenance manuals that contain information about each system.
- D. List of Equipment: List equipment for each system, organized alphabetically by system. For pieces of equipment that are not part of a system, list alphabetically in a separate list.

- E. Identification: In the documentation directory and in each operation and maintenance manual, identify each system, subsystem and piece of equipment with the same designation used in the Contract Documents. If no designation exists, assign a designation according to ASHRAE Guidelines 4, Preparation of Operating and Maintenance Documentation for Building Systems.
- F. Source Data: For each product or system, list names, addresses and telephone numbers of Subcontractors and suppliers, including local source of supplies and replacement parts.
- G. Product Data: Mark each sheet to clearly identify specific products and component parts, and data applicable to installation. Delete inapplicable information.
- H. Drawings: Supplement product data to illustrate relations of component parts of equipment and systems, to show control and flow diagrams. Do not use Project Record Documents as maintenance drawings.
- I. Typed Text: As required to supplement product data. Provide logical sequence of instructions for each procedure, incorporating manufacturer's instructions.

3.5 OPERATION AND MAINTENANCE DATA FOR MATERIALS AND FINISHES

- A. For Each Product, Applied Material, and Finish:
 - 1. Product data, with catalog number, size, composition, and color and texture designations.
 - 2. Information for re-ordering custom manufactured products.
- B. Moisture protection and weather-exposed products: Include product data listing applicable reference standards, chemical composition, and details of installation. Provide recommendations for inspections, maintenance, and repair.
- C. Additional information as specified in individual product specification sections.
- D. Where additional instructions are required, beyond the manufacturer's standard printed instructions, have instructions prepared by personnel experienced in the operation and maintenance of the specific products.

3.6 ASSEMBLY OF OPERATION AND MAINTENANCE MANUALS

- A. Owner's choice: Compile all required documents into an electronic database for Owner's use, with data that is indexed and book marked in the same sequence, as and identified by, the individual Sections.
- B. Owner's choice: Assemble operation and maintenance data into durable manuals for Owner's personnel use, with data arranged in the same sequence as, and identified by, the individual Sections.
 - 1. Project Directory: Title and address of Project; names, addresses, and telephone numbers of Architect/Engineer, Consultants, Contractor and subcontractors, with names of responsible parties.
 - 2. Tables of Contents: List every item in the same sequence as, and identified by, the individual Sections.
- C. Arrangement of Contents: Organize each volume in parts as follows:
 - 1. Project Directory.
 - 2. Table of Contents.
 - 3. Operation and Maintenance Data: Arranged by system, then by product category.

3.7 WARRANTIES AND BONDS

- A. Obtain warranties and bonds, executed in duplicate by responsible Subcontractors, suppliers, and manufacturers, within 10 days after completion of the applicable item of work. Except for items put into use with Owner's permission, leave date of beginning of time of warranty until Date of Substantial completion is determined.
- B. Verify that documents are in proper form, contain full information, and are notarized.

- C. Co-execute submittals when required.
- D. Retain warranties and bonds until time specified for submittal.
- E. Provide original warranties to the Owner.
- F. Table of Contents: Electronically typed, in the sequence of the Table of Contents of the Project Manual, with each item identified with the number and title of the specification section in which specified, and the name of product or work item.

3.8 RECORDING AND MAINTENANCE

- A. Record: Maintain one copy of each submittal during the construction period for project record document purposes. Post changes and revisions to project record documents as they occur, do not wait until end of Project.
- B. Maintenance of Record Documents and Samples: Store record documents and samples in field office apart from Contract Documents used for construction. Do not use project record documents for construction purposes. Maintain record documents in good order and in a clean, dry, legible condition, protected from deterioration and loss. Provide access to project record documents for Architect's/Engineer's reference during normal working hours.

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END OF SECTION 01 7800

**SECTION 01 7839
PROJECT RECORD DOCUMENTS**

PART 1 -GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Record Drawings.
 - 2. Record Specifications.
 - 3. Record Product Data.
 - 4. Miscellaneous record submittals.
- B. Related Requirements:
 - 1. Section 01 7300 "Execution" for final property survey.
 - 2. Section 01 7700 "Closeout Procedures" for general closeout procedures.
 - 3. Section 01 7823 "Operation and Maintenance Data" for operation and maintenance manual requirements.

1.2 CLOSEOUT SUBMITTALS

- A. Record Drawings: Comply with the following:
 - 1. Number of Copies: Submit one set of marked-up record prints.
 - 2. Number of Copies: Submit copies of record Drawings as follows:
 - a. Initial Submittal:
 - 1) Submit one paper-copy set of marked-up record prints.
 - 2) Submit PDF electronic files of scanned record prints and one of file prints.
 - 3) Submit record digital data files and one set of plots.
 - 4) Architect/Engineer will indicate whether general scope of changes, additional information recorded, and quality of drafting are acceptable.
 - b. Final Submittal:
 - 1) Submit three paper-copy sets of marked-up record prints.
 - 2) Submit PDF electronic files of scanned record prints and three sets of prints.
 - 3) Print each drawing, whether or not changes and additional information were recorded.
- B. Record Specifications: Submit one paper copy of Project's Specifications, including addenda and contract modifications.
- C. Record Product Data: Submit one paper copy of each submittal.
 - 1. Where record Product Data are required as part of operation and maintenance manuals, submit duplicate marked-up Product Data as a component of manual.
- D. Miscellaneous Record Submittals: See other Specification Sections for miscellaneous record-keeping requirements and submittals in connection with various construction activities. Submit one paper copy of each submittal.
 - 1. A certificate and drawing, from surveyor licensed in state where project is located, verifying that installed handicap ramp slopes are not greater than slopes indicated on project documents, and that the widths and lengths of the ramps indicated are not less than minimum dimensions required per governing codes and 2010 ADA Standards for Accessible Design published by the U.S. Department of Justice.

PART 2 -PRODUCTS

2.1 RECORD DRAWINGS

- A. Record Prints: Maintain one set of marked-up paper copies of the Contract Drawings and Shop Drawings, incorporating new and revised drawings as modifications are issued. At Contractor's option, record information may be recorded electronically on PDF files of Contract Drawings.
1. Preparation: Mark record prints to show the actual installation where installation varies from that shown originally. Require individual or entity who obtained record data, whether individual or entity is Installer, subcontractor, or similar entity, to provide information for preparation of corresponding marked-up record prints.
 - a. Give particular attention to information on concealed elements that would be difficult to identify or measure and record later.
 - b. Accurately record information in an acceptable drawing technique.
 - c. Record data as soon as possible after obtaining it.
 - d. Record and check the markup before enclosing concealed installations.
 - e. Cross-reference record prints to corresponding archive photographic documentation.
 2. Content: Types of items requiring marking include, but are not limited to, the following:
 - a. Dimensional changes to Drawings.
 - b. Revisions to details shown on Drawings.
 - c. Locations and depths of underground utilities.
 - d. Revisions to routing of piping and conduits.
 - e. Actual equipment locations.
 - f. Changes made by Change Order or Construction Change Directive.
 - g. Changes made following Architect's/Engineer's written orders.
 - h. Details not on the original Contract Drawings.
 - i. Field records for variable and concealed conditions.
 3. Mark the Contract Drawings and Shop Drawings completely and accurately. Use personnel proficient at recording graphic information in production of marked-up record prints.
 4. Mark record sets with erasable, red-colored pencil. Use other colors to distinguish between changes for different categories of the Work at same location.
 5. Mark important additional information that was either shown schematically or omitted from original Drawings.
 6. Note Construction Change Directive numbers, alternate numbers, Change Order numbers, and similar identification, where applicable.
- B. Record Digital Data Files: Immediately before inspection for Certificate of Substantial Completion, review marked-up record prints with Architect. When authorized, prepare a full set of corrected digital data files of the Contract Drawings, as follows:
1. Format: Same digital data software program, version, and operating system as the original Contract Drawings.
 2. Format: DWG, Version 2024, Microsoft Windows operating system.
 3. Format: Annotated PDF electronic file with comment function enabled.
 4. Incorporate changes and additional information previously marked on record prints. Delete, redraw, and add details and notations where applicable.
 5. Refer instances of uncertainty to Architect/Engineer for resolution.
 6. Architect/Engineer will supply Contractor one set of digital data files of the Contract Drawings for use in recording information.
 - a. See Section 01 3300 "Submittal Procedures" for requirements related to use of Architect's/Engineer's digital data files.
 - b. Architect/Engineer will provide data file layer information. Record markups in separate layers.
- C. Newly Prepared Record Drawings: Prepare new Drawings instead of preparing record Drawings where Architect/Engineer determines that neither the original Contract Drawings nor Shop Drawings are suitable to show actual installation.
1. New Drawings may be required when a Change Order is issued as a result of accepting an alternate, substitution, or other modification.

2. Consult Architect/Engineer for proper scale and scope of detailing and notations required to record the actual physical installation and its relation to other construction. Integrate newly prepared record Drawings into record Drawing sets; comply with procedures for formatting, organizing, copying, binding, and submitting.
- D. Format: Identify and date each record Drawing; include the designation "PROJECT RECORD DRAWING" in a prominent location.
 1. Record Prints: Organize record prints and newly prepared record Drawings into manageable sets. Bind each set with durable paper cover sheets. Include identification on cover sheets.
 2. Format: Annotated PDF electronic file with comment function enabled.
 3. Record Digital Data Files: Organize digital data information into separate electronic files that correspond to each sheet of the Contract Drawings. Name each file with the sheet identification. Include identification in each digital data file.
 4. Identification: As follows:
 - a. Project name.
 - b. Date.
 - c. Designation "PROJECT RECORD DRAWINGS."
 - d. Name of Architect/Engineer.
 - e. Name of Contractor.

2.2 RECORD SPECIFICATIONS

- A. Preparation: Mark Specifications to indicate the actual product installation where installation varies from that indicated in Specifications, addenda, and contract modifications.
 1. Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.
 2. Mark copy with the proprietary name and model number of products, materials, and equipment provided, including substitutions and product options selected.
 3. Record the name of manufacturer, supplier, Installer, and other information necessary to provide a record of selections made.
 4. For each principal product, indicate whether record Product Data has been submitted in operation and maintenance manuals instead of submitted as record Product Data.
 5. Note related Change Orders and record Drawings where applicable.
- B. Format: Submit record Specifications as annotated PDF electronic file.

2.3 RECORD PRODUCT DATA

- A. Preparation: Mark Product Data to indicate the actual product installation where installation varies substantially from that indicated in Product Data submittal.
 1. Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.
 2. Include significant changes in the product delivered to Project site and changes in manufacturer recommendations for installation.
 3. Note related Change Orders and record Drawings where applicable.
- B. Format: Submit record Product Data as annotated PDF electronic file.
 1. Include record Product Data directory organized by Specification Section number and title, electronically linked to each item of record Product Data.

2.4 MISCELLANEOUS RECORD SUBMITTALS

- A. Assemble miscellaneous records required by other Specification Sections for miscellaneous record keeping and submittal in connection with actual performance of the Work. Bind or file miscellaneous records and identify each, ready for continued use and reference.
- B. Format: Submit miscellaneous record submittals as PDF electronic file.

1. Include miscellaneous record submittals directory organized by Specification Section number and title, electronically linked to each item of miscellaneous record submittals.

PART 3 -EXECUTION

3.1 RECORDING AND MAINTENANCE

- A. Recording: Maintain one copy of each submittal during the construction period for project record document purposes. Post changes and revisions to project record documents as they occur, do not wait until end of Project.
- B. Maintenance of Record Documents and Samples: Store record documents and Samples in the field office apart from the Contract Documents used for construction. Do not use project record documents for construction purposes. Maintain record documents in good order and in a clean, dry, legible condition, protected from deterioration and loss. Provide access to project record documents for Architect's/Engineer's reference during normal working hours.

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END OF SECTION 01 7839

**SECTION 02 4119
SELECTIVE DEMOLITION**

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Demolition and removal of selected site elements.
 - 2. Salvage of existing items to be reused or recycled.
- B. Related Requirements:
 - 1. Section 01 5639: Temporary protection of existing trees and plants that are affected by selective demolition.
 - 2. Section 31 1000: Site clearing and removal of above- and below-grade improvements not part of selective demolition.

1.2 DEFINITIONS

- A. Remove: Detach items from existing construction and dispose of them off-site unless indicated to be removed and salvaged or removed and reinstalled.
- B. Remove and Salvage: Carefully detach from existing construction in manner to prevent damage and deliver to Owner ready for reuse.
- C. Remove and Reinstall: Detach items from existing construction, prepare for reuse, and reinstall where indicated. Provide new fasteners and anchorage devices needed for reinstallation.
- D. Existing to Remain: Existing items of construction that are not to be permanently removed and that are not otherwise indicated to be removed, removed and salvaged, or removed and reinstalled.
- E. Dismantle: To remove by disassembling or detaching item from a surface, using gentle methods and equipment to prevent damage to the item and surfaces; disposing of items unless indicated to be salvaged or reinstalled.

1.3 MATERIALS OWNERSHIP

- A. Unless otherwise indicated, demolition waste becomes property of Contractor.
- B. Historic items, relics, antiques, and similar objects including, but not limited to, cornerstones and their contents, commemorative plaques and tablets, and other items of interest or intrinsic value to Owner that may be uncovered during demolition remain the property of Owner.
 - 1. Carefully salvage such items in manner to prevent damage and promptly return to Owner.

1.4 PREINSTALLATION MEETINGS

- A. Pre-demolition Conference: Conduct conference at Project site per requirements of Section 01 3100.
 - 1. Inspect and discuss condition of construction to be selectively demolished.
 - 2. Review and finalize selective demolition schedule and verify availability of materials, demolition personnel, equipment, and facilities needed to make progress and avoid delays.

1.5 INFORMATIONAL SUBMITTALS

- A. Engineering Survey: Submit engineering survey of condition of site.

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- B. Proposed Protection Measures: Submit report, including Drawings, that indicates the measures proposed for protecting individuals and property for environmental protection, for dust control and, for noise control. Indicate proposed locations and construction of barriers.
- C. Schedule of Selective Demolition Activities: Indicate the following:
 - 1. Detailed sequence of selective demolition and removal work, with starting and ending dates for each activity. Ensure Owner's on-site operations are uninterrupted.
 - 2. Interruption of utility services. Indicate how long utility services will be interrupted.
 - 3. Coordination for shutoff, capping, and continuation of utility services.
- D. Pre-demolition Photographs or Video: Show existing conditions of site, including existing conditions that might be misconstrued as damage caused by demolition operations. Comply with Section 01 3233. Submit before Work begins.
- E. Warranties: Documentation indicating that existing warranties are still in effect after completion of selective demolition.

1.6 CLOSEOUT SUBMITTALS

- A. List salvaged items.

1.7 FIELD CONDITIONS

- A. Disclaimer: Drawings are based on information supplied by the Owner that has not been verified by the Architect/Engineer or its consultants. The Architect/Engineer therefore disclaims any warranty of correctness or completeness and Contractor is cautioned to carefully examine existing conditions before starting demolition operations.
 - 1. Locations and sizes of existing construction elements may vary from those depicted on the Drawings.
 - 2. The locations of utilities concealed in or by existing construction are unknown, and Contractor is cautioned to exercise care when removing construction elements to accommodate new construction.
- B. Exits: Maintain existing required means of egress for occupied spaces in lawful condition at all times.
- C. Removal Routes: Confine removal of demolished materials to designated routes through site.
- D. Contractor is responsible for cleaning and repair of soiling and damage resulting from demolition operations on site.
- E. Conditions existing at time of inspection for bidding purpose will be maintained by Owner as far as practical.
 - 1. The Owner may remove certain items of equipment before start of demolition Work.
- F. Notify Architect/Engineer of discrepancies between existing conditions and Drawings before proceeding with selective demolition.
- G. Hazardous Materials: It is not expected that hazardous materials will be encountered in the Work.
 - 1. If suspected hazardous materials are encountered, do not disturb; immediately notify Architect/Engineer and Owner. Hazardous materials will be removed by Owner under a separate contract.
- H. Storage or sale of removed items or materials on-site is not permitted.
- I. Utility Service: Maintain existing utilities indicated to remain in service and protect them against damage during selective demolition operations.
- J. Traffic: Conduct demolition operations and removal of debris for minimal interference with streets, sidewalks, and other nearby properties and facilities.

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1. Do not close or obstruct streets, sidewalks, or other nearby properties without permission from authorities having jurisdiction. Provide alternate routes around closed or obstructed traffic paths if required by governing authorities.
- K. Keep site and other areas clean and free from accumulation of debris and waste from demolition operations.
- L. Environmental Controls: Use water sprinkling, temporary enclosures, and other methods to minimize dust and dirt rising and scattering in air. Comply with governing regulations pertaining to environmental protection.
 1. Do not use water when it may create hazardous or objectionable conditions such as ice, flooding, excessive runoff, or pollution.
- M. Utility Services: Maintain existing utilities indicated to remain in service and protect them against damage during demolition operations. Do not interrupt utilities serving occupied or used facilities, except when authorized in writing by authorities having jurisdiction. Provide temporary services during interruptions to existing utilities as acceptable to governing authorities. Maintain fire protection services during selective demolition operations.

1.8 WARRANTY

- A. Existing Warranties: Remove, replace, patch, and repair materials and surfaces cut or damaged during selective demolition, by methods and with materials and using approved contractors so as not to void existing warranties. Notify warrantor before proceeding. Existing warranties include the following:
- B. Notify warrantor on completion of selective demolition, and obtain documentation verifying that existing system has been inspected and warranty remains in effect. Submit documentation at Project closeout.

PART 2 PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Regulatory Requirements: Comply with governing EPA notification regulations before beginning selective demolition. Comply with hauling and disposal regulations of authorities having jurisdiction.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify that utilities have been disconnected and capped before starting selective demolition operations.
- B. Review Project Record Documents of existing construction or other existing condition and hazardous material information provided by Owner. Owner and Architect/Engineer specifically disclaim any warranty that existing conditions are same as those indicated in Project Record Documents.
- C. Survey of Existing Conditions: Record existing conditions by use of measured drawings, preconstruction photographs or video, and templates.
 1. Comply with requirements specified in Section 01 3233.
 2. Inventory and record the condition of items to be removed and salvaged. Provide photographs or video of conditions that might be misconstrued as damage caused by salvage operations.
- D. UTILITY SERVICES AND MECHANICAL/ELECTRICAL SYSTEMS
 1. Existing Services/Systems to Remain: Maintain services/systems indicated to remain and protect them against damage.
 2. Existing Services/Systems to Be Removed, Relocated, or Abandoned: Locate, identify, disconnect, and seal or cap off utility services and mechanical/electrical systems serving areas to be selectively demolished.

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- a. Arrange to shut off utilities with utility companies.
 - b. If services/systems are required to be removed, relocated, or abandoned, provide temporary services/systems that bypass area of selective demolition and that maintain continuity of services/systems to other parts of building.
- E. PROTECTION
 - 1. Temporary Protection: Provide temporary barricades and other protection required to prevent injury to people and damage to adjacent buildings and facilities to remain.
 - a. Provide protection to ensure safe passage of people around selective demolition area.
- F. SELECTIVE DEMOLITION, GENERAL
 - 1. Conduct selective demolition and debris-removal operations to ensure minimum interference with roads, streets, walks, walkways, and other adjacent occupied and used facilities.
 - 2. Demolish and remove existing construction only to the extent required by new construction and as indicated.
 - 3. Removed and Reinstalled Items:
 - a. Clean and repair items to functional condition adequate for intended reuse.
 - b. Pack or crate items after cleaning and repairing. Identify contents of containers.
 - c. Protect items from damage during transport and storage.
 - d. Reinstall items in locations indicated. Comply with installation requirements for new materials and equipment. Provide connections, supports, and miscellaneous materials necessary to make item functional for use indicated.
 - 4. Existing Items to Remain: Protect construction indicated to remain against damage and soiling during selective demolition. When permitted by Architect/Engineer, items may be removed to a suitable, protected storage location during selective demolition and cleaned and reinstalled in their original locations after selective demolition operations are complete.
- G. DISPOSAL OF DEMOLISHED MATERIALS
 - 1. Remove demolition waste materials from Project site and recycle or dispose of them per Section 01 7419 "Construction Waste Management and Disposal".
 - a. Do not allow demolished materials to accumulate on-site.
 - b. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.
 - c. Comply with requirements specified in Section 01 7419.
 - 2. Do not burn demolished materials on site.
- H. REPAIRS
 - 1. Repair demolition performed in excess of that required. Return structures and surfaces to remain to not less than original condition. Repair existing construction or surfaces soiled or damaged by selective demolition operations.
 - 2. Promptly repair damages caused by demolition operations to existing construction indicated to remain, including areas of facility outside Project limits.
 - 3. Where repairs to existing surfaces are required, patch to produce surfaces suitable for new materials.
 - 4. Restore exposed finishes of patched areas and extend finish restoration into adjoining construction to remain in manner that eliminates evidence of patching and refinishing.
- I. CLEANING
 - 1. Return adjacent areas to condition existing before selective demolition operations began.
 - 2. Remove protections, and temporary partitions and closures when no longer needed or when directed by Architect/Engineer.

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END OF SECTION 02 4119

**SECTION 03 3000
CAST-IN-PLACE CONCRETE**

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes: Cast-in-place concrete, including formwork, reinforcement, concrete materials, mixture design, placement procedures, and finishes.

1.2 DEFINITIONS

- A. Cementitious Materials: Portland cement alone or in combination with one or more of the following: blended hydraulic cement, fly ash, slag cement, other pozzolans, and silica fume; materials subject to compliance with requirements.
- B. W/C Ratio: The ratio by weight of water to cementitious materials.

1.3 PREINSTALLATION MEETINGS

- A. Preinstallation Conference: Conduct conference at Project site per requirements of Section 01 3100.
 - 1. Before submitting design mixtures, review concrete design mixture and examine procedures for ensuring quality of concrete materials. Require representatives of each entity directly concerned with cast-in-place concrete to attend, including the following:
 - a. Contractor's superintendent.
 - b. Testing agency.
 - c. Ready-mix concrete manufacturer.
 - d. Concrete Subcontractor.
 - e. Engineer
 - 2. Contractor shall coordinate agenda for meeting and submit to all participants 7 days in advance.

1.4 ACTION SUBMITTALS

- A. Prepare submittals per requirements of Section 01 3300 – Submittal Procedures.
- B. Design Mixtures: Submit concrete mix designs for each class of concrete on project. Submit alternate design mixtures when characteristics of materials, Project conditions, weather, test results, or other circumstances warrant adjustments.
 - 1. Indicate amounts of mixing water to be withheld for later addition at Project site.
 - 2. Waterproofing Admixture for Slabs-on-Grade: Concrete mix design for slabs-on-grade shall include a waterproofing admixture compatible with the manufacturer's requirements of the adhesive applied flooring. Submit for record keeping purposes indicating compliance.
- C. Concrete Reinforcement Shop Drawings: Placing Drawings that detail fabrication, bending, and placement. Include bar sizes, spacings, lengths, material, grade, bar schedules, stirrup spacing, bent bar diagrams, bar arrangement, splices and laps, mechanical connections, tie spacing, hoop spacing, and supports for concrete reinforcement. Include additional reinforcement for openings through concrete structure.
- D. Construction Joint Layout: Indicate proposed construction joints required to construct the structure.
 - 1. Plan showing construction and contraction joints.
 - 2. Location of construction joints is subject to approval of the Architect/Engineer.
- E. Plan showing openings, sleeve penetrations and conduit to be cast in concrete structure.

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1.5 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For Installer and Manufacturer.
- B. Welding certificates.
- C. Material Certificates: For each of the following, signed by manufacturers:
 - 1. Cementitious materials.
 - 2. Admixtures.
 - 3. Form materials and form-release agents.
 - 4. Concrete reinforcement and accessories.
 - 5. Fiber reinforcement.
 - 6. Waterstops.
 - 7. Curing compounds.
 - 8. Floor and slab treatments.
 - 9. Bonding agents.
 - 10. Adhesives.
 - 11. Vapor retarders.
 - 12. Semirigid joint filler.
 - 13. Joint-filler strips.
 - 14. Repair materials.
 - 15. Mechanical reinforcing bar splices
- D. Manufacturer's letter of certification that curing compound will not affect the adhesion of subsequent materials to be applied to concrete.
- E. Manufacturer's letter of certification that form release agents will not affect the bond of waterproofing materials, flooring products, or any other adhered product.
- F. Material Test Reports: For the following, from a qualified testing agency:
 - 1. Aggregates: Confirm absence of deleterious expansion of concrete due to alkali aggregate reactivity.
- G. Formwork Shop Drawings: Prepared by or under the supervision of a qualified licensed structural engineer, detailing fabrication, assembly, support, and removal of formwork.
 - 1. Shoring, Backshoring, and Reshoring: Indicate proposed schedule and sequence of stripping formwork, shoring removal, and backshoring and reshoring installation and removal in accordance with ACI 117 and ACI 347.
- H. Placement Schedule indicating sequence of pours, construction joint locations, and pour strips
- I. Welding Certificates: Copies of certificates for welding procedures and personnel, for record keeping purposes indicating compliance. Certs timeframe
- J. Field quality-control reports.
- K. Minutes of preinstallation conference.
- L. Data correlating air-dry density to fresh bulk density of lightweight concrete.
- M. Plan for Hot Weather Concreting and Cold Weather Concreting.

1.6 QUALITY ASSURANCE

- A. All concrete work shall conform to the "Building Code Requirements for Reinforced Concrete", ACI 318.

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- B. Field Reference Manual: Contractor shall have a copy of the latest edition of "ACI Manual SP-15" available in field office.
- C. Perform concrete reinforcement work in accordance with CRSI "Manual of Standard Practice," and ACI 315.
- D. Installer Qualifications: A qualified installer who employs on Project personnel qualified as ACI-certified Flatwork Technician and Finisher and a supervisor who is an ACI-certified Concrete Flatwork Technician.
- E. Manufacturer Qualifications: A firm experienced in manufacturing ready-mixed concrete products and that complies with ASTM C 94 requirements for production facilities and equipment.
 - 1. Manufacturer certified according to NRMCA "Certification of Ready Mixed Concrete Production Facilities."
- F. Welding Qualifications: Qualify procedures and personnel according to AWS D1.4.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Concrete Reinforcement:
 - 1. Deliver, store, and handle concrete reinforcement to prevent bending and damage. Avoid damaging coatings on steel reinforcement.
 - 2. Store reinforcement off the ground on wood slats or other available means in order to prevent the accumulation of rust and dirt.
- B. Waterstops: Store waterstops under cover to protect from moisture, sunlight, dirt, oil, and other contaminants.
- C. Protect stored admixtures, curing materials, and other products from exposure to harmful weather conditions and with manufacturer's stated temperature limits.

1.8 FIELD CONDITIONS

- A. Cold-Weather Placement: Comply with ACI 306.1 and as follows. Protect concrete work from physical damage or reduced strength that could be caused by frost, freezing actions, or low temperatures.
 - 1. When average high and low temperature is expected to fall below 40 deg F for three successive days, maintain delivered concrete mixture temperature within the temperature range required by ACI 301.
 - 2. Do not use frozen materials or materials containing ice or snow. Do not place concrete on frozen subgrade or on subgrade containing frozen materials.
 - 3. Do not use calcium chloride, salt, or other materials containing antifreeze agents or chemical accelerators unless otherwise specified and approved in mixture designs.
- B. Hot-Weather Placement: Comply with ACI 301 and as follows:
 - 1. Maintain concrete temperature below 90 deg F at time of placement. Chilled mixing water or chopped ice may be used to control temperature, provided water equivalent of ice is calculated to total amount of mixing water. Using liquid nitrogen to cool concrete is Contractor's option.
 - 2. Fog-spray forms, steel reinforcement, and subgrade just before placing concrete. Keep subgrade uniformly moist without standing water, soft spots, or dry areas.

PART 2 PRODUCTS

2.1 FORMWORK AND ACCESSORIES

- A. Form face material in contact with concrete shall be lumber, plywood, tempered concrete-form-grade hardboard, metal, plastic, or paper that creates specified appearance and texture of concrete surface.
- B. Forms for Cylindrical Columns, Pedestals, and Supports: Metal, glass-fiber-reinforced plastic, paper, or fiber tubes that produce surfaces with gradual or abrupt irregularities not exceeding specified formwork surface

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class. Provide units with sufficient wall thickness to resist plastic concrete loads without detrimental deformation.

- C. Pan-Type Forms: Glass-fiber-reinforced plastic or formed steel, stiffened to resist plastic concrete loads without detrimental deformation.
- D. Void Forms: Biodegradable paper surface, treated for moisture resistance, structurally sufficient to support weight of plastic concrete and other superimposed loads.
- E. Chamfer Strips: Wood, metal, PVC, or rubber strips, 3/4 by 3/4 inch, minimum.
- F. Rustication Strips: Wood, metal, PVC, or rubber strips, kerfed for ease of form removal.
- G. Form-Release Agent: Commercially formulated form-release agent that does not bond with, stain, or adversely affect concrete surfaces and does not impair subsequent treatments of concrete surfaces.
 - 1. Formulate form-release agent with rust inhibitor for steel form-facing materials.
- H. Form Ties: Factory-fabricated, removable or snap-off glass-fiber-reinforced plastic or metal form ties designed to resist lateral pressure of fresh concrete on forms and to prevent spalling of concrete on removal.
 - 1. Supply units that leave no corrodible metal closer than 1 inch to the plane of exposed concrete surface.
 - 2. Supply ties that, when removed, leave holes no larger than 1 inch in diameter in concrete surface.
 - 3. Supply ties with integral water-barrier plates to walls indicated to receive dampproofing or waterproofing.

2.2 CONCRETE REINFORCEMENT

- A. Recycled Content of Steel Products: Postconsumer recycled content plus one-half of preconsumer recycled content not less than 25 percent.
- B. Reinforcement: See Structural Drawings for requirements.

2.3 REINFORCEMENT ACCESSORIES

- A. Joint Dowel Bars: ASTM A615, Grade 60, plain-steel bars, cut true to length with ends square and free of burrs.
- B. Epoxy-Coated Joint Dowel Bars: ASTM A615, Grade 60, plain-steel bars, ASTM A775 epoxy coated.
- C. Epoxy Repair Coating: Liquid, two-part, epoxy repair coating; compatible with epoxy coating on reinforcement and complying with ASTM A775.
- D. Zinc Repair Material: ASTM A780.
- E. Bar Supports: Bolsters, chairs, spacers, and other devices for spacing, supporting, and fastening reinforcing bars and welded-wire reinforcement in place. Manufacture bar supports from steel wire, plastic, or precast concrete according to CRSI's "Manual of Standard Practice," of greater compressive strength than concrete and as follows:
 - 1. For concrete surfaces exposed to view, where legs of wire bar supports contact forms, use CRSI Class 1 plastic-protected steel wire or CRSI Class 2 stainless-steel bar supports.
 - 2. For epoxy-coated reinforcement, use epoxy-coated or other dielectric-polymer-coated wire bar supports.
 - 3. For zinc-coated reinforcement, use galvanized wire or dielectric-polymer-coated wire bar supports.

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2.4 CONCRETE MATERIALS

- A. Regional Materials: Concrete shall be manufactured within 500 miles of Project site from aggregates and cementitious materials that have been extracted, harvested, or recovered, as well as manufactured, within 500 miles of Project site.
- B. Source Limitations: Obtain each type or class of cementitious material of the same brand from the same manufacturer's plant, obtain aggregate from single source, and obtain admixtures from single source from single manufacturer.
- C. Cementitious Materials:
 - 1. Portland Cement: ASTM C150, Type I or III, gray color.
 - 2. Fly Ash: ASTM C618, Class F or C.
 - 3. Slag Cement: ASTM C989, Grade 100 or 120.
 - 4. Silica Fume: ASTM C1240, amorphous silica.
- D. Normal-Weight Aggregates: ASTM C33 coarse aggregate or better, graded. Provide aggregates from a single source.
 - 1. Maximum Coarse-Aggregate Size: Per ACI 301 and ACI 318.
 - 2. Fine Aggregate: Free of materials with deleterious reactivity to alkali in cement.
- E. Lightweight Aggregate: ASTM C330.
- F. Air-Entraining Admixture: ASTM C260.
- G. Chemical Admixtures: Certified by manufacturer to be compatible with other admixtures, to contain maximum 0.1 percent water-soluble chloride ions by mass of cementitious material and that do not contribute water-soluble chloride ions exceeding those permitted in hardened concrete. Do not use calcium chloride or admixtures containing calcium chloride.
 - 1. Water-Reducing Admixture: ASTM C494, Type A.
 - 2. Retarding Admixture: ASTM C494, Type B.
 - 3. Water-Reducing and Retarding Admixture: ASTM C494, Type D.
 - 4. High-Range, Water-Reducing Admixture: ASTM C494, Type F.
 - 5. High-Range, Water-Reducing and Retarding Admixture: ASTM C494, Type G.
 - 6. Plasticizing and Retarding Admixture: ASTM C1017, Type II.
- H. Set-Accelerating Corrosion-Inhibiting Admixture: Commercially formulated, anodic inhibitor or mixed cathodic and anodic inhibitor; capable of forming a protective barrier and minimizing chloride reactions with steel reinforcement in concrete and complying with ASTM C494, Type C.
- I. Non-Set-Accelerating Corrosion-Inhibiting Admixture: Commercially formulated, non-set-accelerating, anodic inhibitor or mixed cathodic and anodic inhibitor; capable of forming a protective barrier and minimizing chloride reactions with steel reinforcement in concrete.
- J. Moisture Vapor Emission Control Admixture: Subject to compliance with requirements, supply products from one of the following.
 - 1. Concure Admixture
 - 2. ISE Logik MVRA 900
- K. Integral Waterproofing Admixture: Crystalline type that permanently fixes a non-soluble crystalline structure throughout the capillary voids of the concrete to resist passage of liquids with hydrostatic head pressure while permitting water vapor transmission.
 - 1. Permeability: Tested per U.S. Army Corps of Engineers CRD-C48-73 "Permeability of Concrete" to 150 psi (350 foot head of water) without exhibiting measurable leakage.
 - 2. Compressive Strength: Tested per ASTM C39 against untreated control sample. At 28 days, the treated samples shall exhibit the same or better compressive strength over the control sample.

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3. Potable Water Approval: Tested per NSF Standard 61, and NSF certified approval for use of waterproofing material on structures holding potable water.
4. Subject to compliance with requirements, supply one of the following products.
 - a. Xypex Chemical Corporation; Xypex Admix [C-500.] [C-1000.] [C-2000.]
 - b. R. Meadows; Gemlite ADI-CON CW PLUS
 - c.

L. Water: ASTM C94 .

2.5 WATERSTOPS

- A. Self-Expanding Rubber Strip Waterstops: Manufactured rectangular or trapezoidal strip, bentonite-free hydrophilic polymer-modified chloroprene rubber, for adhesive bonding to concrete, 3/8 by 3/4 inch.
- B. Flexible Rubber Waterstops: CE CRD-C 513, with factory-installed metal eyelets, for embedding in concrete to prevent passage of fluids through joints. Factory fabricate corners, intersections, and directional changes.
 1. Profile: Flat dumbbell with center bulb.
 2. Dimensions: 4 inches by 3/16 inch thick; nontapered.
- C. Chemically Resistant Flexible Waterstops: Thermoplastic elastomer rubber waterstops with factory-installed metal eyelets, for embedding in concrete to prevent passage of fluids through joints; resistant to oils, solvents, and chemicals. Factory fabricate corners, intersections, and directional changes.
 1. Profile: Flat dumbbell with center bulb.
 2. Dimensions: 4 inches by 3/16 inch thick; nontapered.

2.6 VAPOR RETARDERS

- A. Sheet Vapor Retarder:
 1. 10 mil. thickness; ASTM E 1745, Class A
 2. Not more than 0.01 perms as measured after for Permeance After Conditioning, ASTM E 154
 3. Include manufacturer's recommended adhesive or pressure-sensitive tape.

2.7 CURING MATERIALS

- A. Evaporation Retarder: Waterborne, monomolecular film forming, manufactured for application to fresh concrete.
- B. Absorptive Cover: AASHTO M 182, Class 2, burlap cloth made from jute or kenaf, weighing approximately 9 oz./sq. yd when dry.
- C. Moisture-Retaining Cover: ASTM C 171, polyethylene film or white burlap-polyethylene sheet.
- D. Water: Potable.
- E. Clear, Membrane-Forming Curing Compound meeting either ASTM C 309, Type 1, Class B, or ASTM C 1315, Type 1, Class A as required to not interfere with bonding of floor covering.

2.8 RELATED MATERIALS

- 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 according to ASTM D2240.
- C. Bonding Agent: ASTM C1059, Type II, nonredispersible, acrylic emulsion or styrene butadiene.

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- D. Reglets: Fabricate reglets of not less than 0.022-inch-thick, galvanized-steel sheet. Temporarily fill or cover face opening of reglet to prevent intrusion of concrete or debris.
- E. Dovetail Anchor Slots: Hot-dip galvanized-steel sheet, not less than 0.034 inch thick, with bent tab anchors. Temporarily fill or cover face opening of slots to prevent intrusion of concrete or debris.

2.9 CONCRETE MIXTURES

- A. Prepare design mixtures for each type and strength of concrete, proportioned on the basis of laboratory trial mixture or field test data, or both, according to ACI 301.
- B. Cementitious Materials: Use fly ash, pozzolan, slag cement, and silica fume as needed to reduce the total amount of portland cement to meet LEED requirements and contractor requirements. For concrete exposed to deicing chemicals, limit cement replacement as recommended by ACI 301.
- C. Limit water-soluble, chloride-ion content in hardened concrete to 0.6 percent by weight of cement.
- D. Admixtures: Use admixtures according to manufacturer recommendations.
 - 1. Use water-reducing admixture in pumped concrete, concrete for heavy-use industrial slabs and parking structure slabs, concrete required to be watertight, and concrete with a w/c ratio below 0.50.
 - 2. Use corrosion-inhibiting admixture in concrete mixtures where indicated.
- E. Refer to drawings for concrete strength and other requirements.
- F. Air Content:
 - 1. Air content for Exposure Class F0 shall be 2 to 4 percent.
 - 2. Do not air entrain concrete to trowel-finished interior floors. Do not allow entrapped air content to exceed 3 percent.
 - 3. Air content for other Exposure Classes shall be as follows:

Nominal Maximum Aggregate Size	Air content percentage	
	Exposure Class F1	Exposure Class F2 or F3
3/8 inch	6	7.5
1/2 inch	5.5	7
3/4 inch	5	6
1 inch	4.5	6
1 1/2 inches	4.5	5.5
 - 4. Air Content Tolerance: +/- 1.5 percent.
- G. Slump limits shall satisfy recommendations of ACI 301.

2.10 FABRICATING REINFORCEMENT

- A. Fabricate concrete reinforcement according to CRSI "Manual of Standard Practice."

2.11 CONCRETE MIXING

- A. Ready-Mixed Concrete: Measure, batch, mix, and deliver concrete according to ASTM C94 and ASTM C1116, and supply batch ticket information.
 - 1. When air temperature is between 85 and 90 deg F, reduce mixing and delivery time from 1-1/2 hours to 75 minutes; when air temperature is above 90 deg F, reduce mixing and delivery time to 60 minutes.
- B. Site mixing is not permitted.

PART 3 EXECUTION

3.1 FORMWORK INSTALLATION

- A. Design, erect, shore, brace, and maintain formwork, according to ACI 301, to support vertical, lateral, static, and dynamic loads, and construction loads that might be applied, until structure can support such loads.
- B. Construct formwork so concrete members and structures are of size, shape, alignment, elevation, and position indicated, within tolerance limits of ACI 117. Regardless of tolerances specified, no portion of building shall extend beyond legal boundary of project.
- C. Construct forms tight enough to prevent loss of concrete mortar.
- D. Limit concrete surface irregularities, designated by ACI 347R as abrupt or gradual, as follows:
 - 1. Class A, 1/8 inch for smooth-formed finished surfaces.
 - 2. Class B, 1/4 inch for rough-formed finished surfaces.
- E. Construct forms for easy removal without hammering or prying against concrete surfaces. Provide crush or wrecking plates where stripping may damage cast-concrete surfaces. Provide top forms for inclined surfaces steeper than 1.5 horizontal to 1 vertical.
 - 1. Install keyways, reglets, recesses, and the like, for easy removal.
 - 2. Do not use rust-stained steel form-facing material.
- F. Set edge forms, bulkheads, and intermediate screed strips for slabs to achieve required elevations and slopes in finished concrete surfaces. Provide and secure units to support screed strips; use strike-off templates or compacting-type screeds.
- G. Provide temporary openings for cleanouts and inspection ports where interior area of formwork is inaccessible. Close openings with panels tightly fitted to forms and securely braced to prevent loss of concrete mortar. Locate temporary openings in forms at inconspicuous locations.
- H. Chamfer exterior corners and edges of permanently exposed concrete.
- I. Form openings, chases, offsets, sinkages, keyways, reglets, blocking, screeds, and bulkheads required in the Work. Determine sizes and locations from trades providing such items.
- J. Clean forms and adjacent surfaces to receive concrete. Remove chips, wood, sawdust, dirt, and other debris just before placing concrete.
- K. Retighten forms and bracing before placing concrete, as required, to prevent mortar leaks and maintain proper alignment.
- L. Coat contact surfaces of forms with form-release agent, according to manufacturer recommendations, before placing reinforcement.
- M. Void Forms:
 - 1. Store void forms according to manufacturer's instructions.
 - 2. Forms shall be placed on a smooth, firm, dry bed of suitable material to avoid being displaced vertically and shall be set tight with no buckling.
 - 3. Each section of form shall have its end sealed by dipping in parafin, with any additional cutting of forms at the jobsite to be field-dipped in the same material.
 - 4. To prevent separation during concrete placement, void forms shall be assembled with steel or plastic banding at 4 feet on center, maximum, or by adequate stapling or gluing, as recommended by the manufacturer.

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5. Before placement of reinforcement, the entire formed area for slabs shall be covered with 4- by 8-foot flat sheets of fiber void corrugated fiberboard. Joints shall be sealed with a moisture-resistant tape having a minimum width of 3 inches.
6. The manufacturer's representative shall inspect the in-place forms, as well as storage of the forms.
7. Do not let void forms become exposed to moisture. If forms get wet or are damaged they shall be reinspected by the manufacturer and written confirmation provided regarding their adequacy or replaced.

3.2 EMBEDDED ITEM INSTALLATION

- A. Place and secure anchorage devices and other embedded items required for adjoining work that is attached to or supported by cast-in-place concrete. Use setting drawings, templates, diagrams, instructions, and directions supplied with items to be embedded.
 1. Install anchor rods, accurately located, to elevations required and complying with tolerances in Section 7.5 of AISI 303.
 2. Install reglets to receive waterproofing and to receive through-wall flashings in outer face of concrete frame at exterior walls, where flashing is shown at lintels, shelf angles, and other conditions.
 3. Install dovetail anchor slots in concrete structures as indicated.
 4. Fill voids in sleeves, inserts, and anchor slots temporarily with removable material to prevent entry of concrete into voids.
- B. Conduit to be embedded in slabs which is not indicated on Structural Drawings may be placed in concrete within the following limitations:
 1. Conduit shall not be larger in outside dimensions than one-third overall thickness of slab in which they are embedded or one inch, whichever is smaller.
 2. Place conduit in slabs between top and bottom reinforcement. Place conduit in maximum groupings of three and not spaced less than 3 inches clear between adjacent groupings of conduit or reinforcement. Do not place in two layers.
 3. In slabs with only one mat of reinforcement, provide the following concrete cover to conduit, including fittings:
 - a. Concrete exposed to earth or weather, 1-1/2 inches.
 - b. Concrete not exposed to weather or in contact with ground, 3/4 inch.
 4. Notify Engineer in writing of any conduit to be embedded which cannot meet herein-stated limitations.
- C. Position embedded items to avoid conflicts with reinforcement. Provide 1/2 inch clear cover between reinforcement and inserts, anchors and embedded items, and between sleeves and reinforcement. Notify Engineer of conflicts between embedded items and reinforcement before correction.
- D. No embedded items made of aluminum shall be permitted unless coated effectively or covered to prevent aluminum-concrete reaction or electrolytic action between aluminum and steel.

3.3 REMOVING AND REUSING FORMS

- A. Clean and repair surfaces of forms to be reused in the Work. Split, frayed, delaminated, or otherwise damaged form-facing material are not acceptable for exposed surfaces. Apply new form-release agent.
- B. When forms are reused, clean surfaces, remove fins and laitance, and tighten to close joints. Align and secure joints to avoid offsets. Do not use patched forms for exposed concrete surfaces unless approved by Architect/Engineer.

3.4 VAPOR-RETARDER INSTALLATION

- A. Sheet Vapor Retarders: Place, protect, and repair sheet vapor retarder according to ASTM E 1643 and manufacturer recommendations.
 1. Lap joints 6 inches and seal with manufacturer's recommended tape.

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3.5 CONCRETE REINFORCEMENT INSTALLATION

- A. General: Comply with CRSI "Manual of Standard Practice" for fabricating, placing, and supporting reinforcement.
 - 1. Do not cut or puncture vapor retarder. Repair damage and reseal vapor retarder before placing concrete.
- B. Clean reinforcement of loose rust and mill scale, earth, ice, and other foreign materials that reduce bond to concrete.
- C. Accurately position, support, and secure reinforcement against displacement. Locate and support reinforcement with bar supports to maintain minimum concrete cover. Do not tack weld crossing reinforcing bars.
 - 1. Weld reinforcing bars according to AWS D1.4, where indicated.
- D. Set wire ties with ends directed into concrete, not toward exposed concrete surfaces.
- E. Install welded-wire reinforcement in longest practicable lengths on bar supports spaced to minimize sagging. Lap edges and ends of adjoining sheets at least one mesh spacing. Offset laps of adjoining sheet widths to prevent continuous laps in either direction. Lace overlaps with wire.

3.6 MECHANICAL REINFORCING BAR SPLICING

- A. Splices made with mechanical bar splices shall be as detailed on the plans. Any additional splices require prior written authorization from the Engineer.
- B. Coordinate size of proposed mechanical bar splices with physical restraints, such as formwork and reinforcing conflicts, of the intended use.
- C. Mechanical bar splices detailed for connections of future reinforcing shall be capped or protected according to the manufacturer's instructions.

3.7 JOINTS

- A. General: Construct joints true to line with faces perpendicular to surface plane of concrete.
- B. Construction Joints: Install so strength and appearance of concrete are not impaired, at locations indicated or as approved by Architect/Engineer.
 - 1. Place joints perpendicular to main reinforcement. Continue reinforcement across construction joints unless otherwise indicated.
 - 2. Form keyed joints as indicated. Embed keys at least 1-1/2 inches into concrete.
 - 3. Space vertical joints in walls as indicated. Locate joints beside piers integral with walls, near corners, and in concealed locations where possible.
 - 4. Sawed Joints: Form contraction joints with power saws equipped with shatterproof abrasive or diamond-rimmed blades. Cut 1/8-inchwide joints into concrete when cutting action does not tear, abrade, or otherwise damage surface and before concrete develops random contraction cracks.
- C. Isolation Joints in Slabs-on-Grade: After removing formwork, install joint-filler strips at slab junctions with vertical surfaces, such as column pedestals, foundation walls, grade beams, and other locations, as indicated.
 - 1. Extend joint-filler strips full width and depth of joint, terminating flush with finished concrete surface unless otherwise indicated.
 - 2. Terminate full-width joint-filler strips not less than 1/2 inch or more than 1 inch below finished concrete surface where joint sealants, specified in Section 07 9200 "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.

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- D. Doweled Joints: Install dowel bars and support assemblies at joints where indicated. Lubricate or asphalt coat one-half of dowel length to prevent concrete bonding to one side of joint.

3.8 WATERSTOP INSTALLATION

- A. Flexible Waterstops: Install in construction joints and at other joints indicated to form a continuous diaphragm. Install in longest lengths practicable. Support and protect exposed waterstops during progress of the Work. Field fabricate joints in waterstops according to manufacturer recommendations.
- B. Self-Expanding Strip Waterstops: Install in construction joints and at other locations indicated, according to manufacturer recommendations, adhesive bonding, mechanically fastening, and firmly pressing into place. Install in longest lengths practicable.

3.9 CONCRETE PLACEMENT

- A. Before placing concrete, verify that installation of formwork, reinforcement, and embedded items is complete and that required inspections are completed.
- B. Do not add water to concrete during delivery, at Project site, or during placement unless approved by Architect/Engineer.
- C. Before test sampling and placing concrete, water may be added at Project site, subject to limitations of ACI 301.
 - 1. Do not add water to concrete after adding high-range water-reducing admixtures to mixture.
- D. Deposit concrete continuously in one layer or in horizontal layers of such thickness that no new concrete is placed on concrete that has hardened enough to cause seams or planes of weakness. If a section cannot be placed continuously, provide construction joints as indicated. Deposit concrete to avoid segregation.
 - 1. Deposit concrete in horizontal layers of depth not to exceed formwork design pressures and in a manner to avoid inclined construction joints.
 - 2. Consolidate placed concrete with mechanical vibrating equipment according to ACI 301.
 - 3. Do not use vibrators to transport concrete inside forms. Insert and withdraw vibrators vertically at uniformly spaced locations to rapidly penetrate placed layer and at least 6 inches into preceding layer. Do not insert vibrators into lower layers of concrete that have begun to lose plasticity. At each insertion, limit duration of vibration to time necessary to consolidate concrete and complete embedment of reinforcement and other embedded items without causing mixture constituents to segregate.
- E. Deposit and consolidate concrete for floors and slabs in a continuous operation, within limits of construction joints, until placement of a panel or section is complete.
 - 1. Consolidate concrete during placement operations, so concrete is thoroughly worked around reinforcement and other embedded items and into corners.
 - 2. Maintain reinforcement in position on chairs during concrete placement.
 - 3. Screed slab surfaces with a straightedge and strike off to correct elevations.
 - 4. Slope surfaces uniformly to drains where required.
 - 5. Begin initial floating using bull floats or darbies to form a uniform and open-textured surface plane, before excess bleedwater appears on the surface. Do not further disturb slab surfaces before starting finishing operations.

3.10 FINISHING FORMED SURFACES

- A. Surface Finish Classifications:
 - 1. Surface finish-1.0 (SF-1.0):
 - a. No formwork facing material is specified
 - b. Patch voids larger than 1-1/2 in. wide or 1/2 in. deep
 - c. Remove projections larger than 1 in.
 - d. Tie holes need not be patched

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- e. Surface tolerance Class D as specified in ACI 117
 - f. Mock-up not required
- 2. Surface Finish-2.0 (SF-2.0):
 - a. Patch voids larger than 3/4 in. wide or 1/2 in. deep
 - b. Remove projections larger than 1/4 in.
 - c. Patch tie holes
 - d. Surface tolerance Class B as specified in ACI 117
 - e. Provide mock-up of concrete surface appearance and texture
- 3. Surface Finish 3.0 (SF-3.0):
 - a. Patch voids larger than 3/4 in. wide or 1/2 in. deep
 - b. Remove projections larger than 1/8 in.
 - c. Patch tie holes
 - d. Surface tolerance Class A as specified in ACI 117
 - e. Provide mock-up of concrete surface appearance and texture
- B. Unless otherwise specified, apply the following finishes to concrete surfaces:
 - 1. 0 on concrete surfaces not exposed to view.
 - 2. 0 on concrete surfaces exposed to view.
- C. Rubbed Finish: Apply the following to smooth-formed-finished as-cast concrete where indicated:
 - 1. Smooth-Rubbed Finish: Not later than one day after form removal, moisten concrete surfaces and rub with carborundum brick or another abrasive until producing a uniform color and texture. Do not apply cement grout other than that created by the rubbing process.
 - 2. Grout-Cleaned Finish: Wet concrete surfaces and apply grout of a consistency of thick paint to coat surfaces and fill small holes. Mix 1 part portland cement to 1-1/2 parts fine sand with a 1:1 mixture of bonding admixture and water. Add white portland cement in amounts determined by trial patches, so color of dry grout matches adjacent surfaces. Scrub grout into voids and remove excess grout. When grout whitens, rub surface with clean burlap and keep surface damp by fog spray for at least 36 hours.
- D. Related Unformed Surfaces: At tops of walls, horizontal offsets, and similar unformed surfaces adjacent to formed surfaces, strike off smooth and finish with a texture matching adjacent formed surfaces. Continue final surface treatment of formed surfaces uniformly across adjacent unformed surfaces unless otherwise indicated.

3.11 MISCELLANEOUS CONCRETE ITEM INSTALLATION

- A. Filling In: Fill in holes and openings left in concrete structures after work of other trades is in place unless otherwise indicated. Mix, place, and cure concrete, as specified, to blend with in-place construction. Provide other miscellaneous concrete filling indicated or required to complete the Work.
- B. Curbs: Provide monolithic finish to interior curbs by stripping forms while concrete is still green and by steel-troweling surfaces to a hard, dense finish with corners, intersections, and terminations slightly rounded.

3.12 CONCRETE PROTECTING AND CURING

- A. General: Protect freshly placed concrete from premature drying and excessive cold or hot temperatures. Comply with ACI 306.1 for cold-weather protection and ACI 301 for hot-weather protection during curing.
- B. Evaporation Retarder: Apply evaporation retarder to unformed concrete surfaces if hot, dry, or windy conditions cause moisture loss approaching 0.2 lb/sq ft x h before and during finishing operations. Apply according to manufacturer recommendations after placing, screeding, and bull floating or darbying concrete, but before float finishing.
- C. Formed Surfaces: Cure formed concrete surfaces, including underside of beams, supported slabs, and other similar surfaces. If forms remain during curing period, moist cure after loosening forms. If removing forms before end of curing period, continue curing for remainder of curing period.

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- D. Unformed Surfaces: Begin curing immediately after finishing concrete. Cure unformed surfaces, including floors and slabs, concrete floor toppings, and other surfaces.
- E. Cure concrete according to ACI 308.1, by one or a combination of the following methods:
 - 1. Moisture Curing: Keep surfaces continuously moist for not less than seven days with the following materials:
 - a. Water.
 - b. Continuous water-fog spray.
 - c. Absorptive cover, water saturated and kept continuously wet. Cover concrete surfaces and edges with 12-inch lap over adjacent absorptive covers.
 - 2. Moisture-Retaining-Cover Curing: Cover concrete surfaces with moisture-retaining cover for curing concrete, placed in widest practicable width, with sides and ends lapped at least 12 inches, and sealed by waterproof tape or adhesive. Cure for not less than seven days. Immediately repair any holes or tears during curing period, using cover material and waterproof tape.
 - a. Moisture cure or use moisture-retaining covers to cure concrete surfaces to receive floor coverings.
 - b. Moisture cure or use moisture-retaining covers to cure concrete surfaces to receive penetrating liquid floor treatments.
 - c. Cure concrete surfaces to receive floor coverings with either a moisture-retaining cover or a curing compound that the manufacturer certifies does not interfere with bonding of floor covering used on Project.
 - 3. Curing Compound: Apply uniformly in continuous operation by power spray or roller according to manufacturer recommendations. Recoat areas subjected to heavy rainfall within three hours after initial application. Maintain continuity of coating and repair damage during curing period.
 - a. Removal: After curing period has elapsed, remove curing compound without damaging concrete surfaces by method recommended by curing compound manufacturer.
 - 4. Curing and Sealing Compound: Apply uniformly to floors and slabs indicated in a continuous operation by power spray or roller according to manufacturer recommendations. Recoat areas subjected to heavy rainfall within three hours after initial application. Repeat process 24 hours later and apply a second coat. Maintain continuity of coating and repair damage during curing period.

3.13 JOINT FILLING

- A. Prepare, clean, and install joint filler according to manufacturer recommendations.
 - 1. Defer joint filling until concrete has aged at least 30 days unless indicated otherwise in documents. Do not fill joints until construction traffic has permanently ceased.
- 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. Overfill joint and trim joint filler flush with top of joint after hardening.

3.14 CONCRETE SURFACE REPAIRS

- A. Defective Concrete: Repair and patch defective areas when approved by Architect/Engineer. Remove and replace concrete that cannot be repaired and patched to Architect's/Engineer's approval.
- B. Patching Mortar: Mix dry-pack patching mortar, consisting of one 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, spalls, air bubbles, honeycombs, rock pockets, fins and other projections on the surface, and stains and other discolorations that cannot be removed by cleaning.
 - 1. Immediately after form removal, cut out honeycombs, rock pockets, and voids more than 1/2 inch in any dimension to solid concrete. Limit cut depth to 3/4 inch. Make edges of cuts perpendicular to

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- concrete surface. Clean, dampen with water, and brush-coat holes and voids with bonding agent. Fill and compact with patching mortar before bonding agent has dried. Fill form-tie voids with patching mortar or cone plugs secured in place with bonding agent.
2. Repair defects on surfaces exposed to view by blending white portland cement and standard portland cement so that, when dry, patching mortar matches surrounding color. Patch a test area at inconspicuous locations to verify mixture and color match before proceeding with patching. Compact mortar in place and strike off slightly higher than surrounding surface.
 3. Repair defects on concealed formed surfaces that affect concrete's durability and structural performance as determined by Architect/Engineer.
- D. Repairing Unformed Surfaces: Test unformed surfaces, such as floors and slabs, for finish and verify surface tolerances specified for each surface. Correct low and high areas. Test surfaces sloped to drain for trueness of slope and smoothness; use a sloped template.
1. Repair finished surfaces containing defects. Surface defects include 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, and other objectionable conditions.
 2. After concrete has cured at least 14 days, correct high areas by grinding.
 3. Correct localized low areas during or immediately after completing surface finishing operations by cutting out low areas and replacing with patching mortar. Finish repaired areas to blend into adjacent concrete.
 4. Correct other low areas scheduled to receive floor coverings with a repair underlayment. Prepare, mix, and apply repair underlayment and primer according to manufacturer recommendations to produce a smooth, uniform, plane, and level surface. Feather edges to match adjacent floor elevations.
 5. Correct other low areas scheduled to remain exposed with a repair topping. Cut out low areas to ensure minimum repair topping depth of 1/4 inch to match adjacent floor elevations. Prepare, mix, and apply repair topping and primer according to manufacturer recommendations to produce a smooth, uniform, plane, and level surface.
 6. Repair defective areas, except random cracks and single holes 1 inch or less in diameter, by cutting out and replacing with fresh concrete. Remove defective areas with clean, square cuts and expose steel reinforcement with at least a 3/4-inch clearance all around. Dampen concrete surfaces in contact with patching concrete and apply bonding agent. Mix patching concrete of same materials and mixture as original concrete, except without coarse aggregate. Place, compact, and finish to blend with adjacent finished concrete. Cure in same manner as adjacent concrete.
 7. Repair random cracks and single holes 1 inch or less in diameter with patching mortar. Groove top of cracks and cut out holes to sound concrete and clean off dust, dirt, and loose particles. Dampen cleaned concrete surfaces and apply bonding agent. Place patching mortar before bonding agent has dried. Compact patching mortar and finish to match adjacent concrete. Keep patched area continuously moist for at least 72 hours.
- E. Perform structural repairs of concrete, subject to Architect's/Engineer's approval, using epoxy adhesive and patching mortar.
- F. Repair materials and installation not specified above may be used, subject to Architect's/Engineer's approval.

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END OF SECTION 03 3000

**SECTION 31 0519
GEOSYNTHETICS FOR EARTHWORK**

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Geotextile for separation.
- B. Geotextile for filtration.
- C. Geotextile for protection.

1.2 RELATED REQUIREMENTS

- A. Section 02 4119 - Selective Demolition.
- B. Section 31 1000 - Site Clearing.
- C. Section 31 2200 - Grading.
- D. Section 31 2316 - Excavation.
- E. Section 31 2316.13 - Trenching.
- F. Section 31 2323 - Fill.

1.3 REFERENCE STANDARDS

- A. AASHTO M 288 - Standard Specification for Geosynthetic Specification for Highway Applications; 2022.
- B. ASTM D1621 - Standard Test Method for Compressive Properties of Rigid Cellular Plastics; 2016 (Reapproved 2023).
- C. ASTM D4355/D4355M - Standard Test Method for Deterioration of Geotextiles by Exposure to Light, Moisture, and Heat in a Xenon Arc-Type Apparatus; 2021.
- D. ASTM D4491/D4491M - Standard Test Methods for Water Permeability of Geotextiles by Permittivity; 2022.
- E. ASTM D4533/D4533M - Standard Test Method for Trapezoid Tearing Strength of Geotextiles; 2015 (Reapproved 2023).
- F. ASTM D4595 - Standard Test Method for Tensile Properties of Geotextiles by the Wide-Width Strip Method; 2017.
- G. ASTM D4632/D4632M - Standard Test Method for Grab Breaking Load and Elongation of Geotextiles; 2015a (Reapproved 2023).
- H. ASTM D4716/D4716M - Standard Test Method for Determining the (In-Plane) Flow Rate per Unit Width and Hydraulic Transmissivity of a Geosynthetic Using a Constant Head; 2022.
- I. ASTM D4751 - Standard Test Methods for Determining Apparent Opening Size of a Geotextile; 2021a.
- J. ASTM D4833/D4833M - Standard Test Method for Index Puncture Resistance of Geomembranes and Related Products; 2007 (Reapproved 2020).

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- K. ASTM D4873/D4873M - Standard Guide for Identification, Storage, and Handling of Geosynthetic Rolls and Samples; 2017 (Reapproved 2021).
- L. ASTM D4886 - Standard Test Method for Abrasion Resistance of Geotextiles (Sandpaper/Sliding Block Method); 2018.
- M. ASTM D5199 - Standard Test Method for Measuring the Nominal Thickness of Geosynthetics; 2012 (Reapproved 2019).
- N. ASTM D5321/D5321M - Standard Test Method for Determining the Shear Strength of Soil-Geosynthetic and Geosynthetic-Geosynthetic Interfaces by Direct Shear; 2021.
- O. ASTM D6241 - Standard Test Method for Static Puncture Strength of Geotextiles and Geotextile- Related Products Using a 50-mm Probe; 2014.
- P. ASTM D6637/D6637M - Standard Test Method for Determining Tensile Properties of Geogrids by the Single or Multi-Rib Tensile Method; 2015.
- Q. ASTM D6706 - Standard Test Method for Measuring Geosynthetic Pullout Resistance in Soil; 2001 (Reapproved 2021).
- R. ASTM D7005/D7005M - Standard Test Method for Determining the Bond Strength (Ply Adhesion) of Geocomposites; 2016.
- S. ASTM D7179 - Standard Test Method for Determining Geonet Breaking Force; 2018.
- T. ASTM D7737/D7737M - Standard Test Method for Individual Geogrid Junction Strength; 2015.
- U. ASTM D7877 - Standard Guide for Electronic Methods for Detecting and Locating Leaks in Waterproof Membranes; 2024.
- V. ASTM G21 - Standard Practice for Determining Resistance of Synthetic Polymeric Materials to Fungi; 2015, with Editorial Revision (2021).
- W. GRI GM13 - Test Methods, Test Properties and Testing Frequency for High Density Polyethylene (HDPE) Smooth and Textured Geomembranes; 2021.
- X. GRI GM17 - Test Methods, Test Properties and Testing Frequency for Linear Low Density Polyethylene (LLDPE) Smooth and Textured Geomembranes; 2021.
- Y. GRI GM29 - Field Integrity Evaluation of Geomembrane Seams (and Sheet) Using Destructive and/or Nondestructive Testing; 2019.
- Z. GRI GM32 - Geomembrane Seaming Using Data Acquisition Hot Wedge Welding Devices; 2019.

1.4 ADMINISTRATIVE REQUIREMENTS

- A. Preinstallation Meeting: Conduct a preinstallation meeting one week prior to the start of the work of this section; require attendance by all affected installers.
- B. Sequencing: Ensure that utility connections are achieved in an orderly and expeditious manner.

1.5 SUBMITTALS

- A. See Section 01 3300 - Submittal Procedures, for submittal procedures.

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- B. Product Data: Manufacturer's data on each product to be used, including physical properties, seaming materials, and installation instructions.
- C. Shop Drawings:
 - 1. Indicate overall layout, dimensions, geotextile sheet and seam layout.
 - 2. Indicate anchorage, penetration, and seaming details.
- D. Manufacturer's Certification: Indicating the proposed geosynthetic function meets design requirements supported by applicable testing results.
- E. Test Reports:
 - 1. Indicate results of field leakage tests.
 - 2. Indicate results of field interface friction tests.
- F. Manufacturer's Instructions: Indicate seaming method.
- G. Manufacturer's qualification statement.
- H. Installer's qualification statement.

1.6 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section, with at least three years of documented experience.
- B. Installer Qualifications: Company specializing in performing work of the type specified and with at least three years of documented experience and approved by manufacturer.
- C. Testing Agency Qualifications: Independent firm specializing in performing testing and inspections of the type specified in this section.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. See Section 01 6000 - Product Requirements for additional requirements.
- B. Identify, store, and handle geosynthetic rolls and samples according to ASTM D4873/D4873M.
- C. Protect materials from sunlight and other ultraviolet light sources during storage.
- D. Handle geosynthetics with care and prevent dragging, dropping, or imbalanced lifting.

1.8 FIELD CONDITIONS

- A. Temperature Requirements: Do not place geosynthetic when ambient air or base surface temperature is less than 40 degrees F or above 140 degrees F (60 degrees C).
- B. Surface Requirements: Do not place geosynthetic when the receiving surface is saturated or has ponded water.
- C. Follow recommendations of geosynthetic manufacturer.

PART 2 PRODUCTS

2.1 GEOSYNTHETIC

- A. Provide geosynthetic in largest size sheets as possible to minimize field joining.

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- B. Uniform thickness according to ASTM D5199.
- C. Resistant to mildew, chemicals in soil, stable under freeze-thaw cycles, will not shrink or expand under wet conditions, and will not unravel or become clogged during use.
- D. Ultraviolet Stability: 65 percent, minimum, when tested in accordance with ASTM D4355/D4355M.
- E. Abrasion Resistance: 80 percent loss for 250 cycles, when tested in accordance with ASTM D4886.

2.2 GEOTEXTILE

- A. General:
 - 1. Material: Polyethylene consisting of 5 percent maximum regrind and free of contaminants.
 - 2. AASHTO M 288.
 - 3. Elongation: 35 percent, minimum, when tested in accordance with ASTM D4632/D4632M.
- B. Geotextile for Separation: Capable of restricting adjacent material mixing.
 - 1. Type: Woven.
 - 2. Seams: Loose laid.
 - a. Overlap: According to manufacturer.
 - 1) 12 inches (300 mm), minimum, in all directions.
 - 2) 3 inches (76 mm), minimum, in all direction.
 - b. Stitch: According to manufacturer; continuous; tied off at ends.
 - c. Strength: 90 percent of grab, minimum, when tested in accordance with ASTM D4632/D4632M.
 - d. Limit seams perpendicular to the direction of construction.
 - 3. Grab Strength: 300 lb (1.3 kN), minimum, when tested in accordance with ASTM D4632/D4632M.
 - 4. Puncture Strength: 450 lb (2.0 kN), minimum, when tested in accordance with ASTM D4833/D4833M.
 - 5. Trapezoid Tear Strength: 100 lb (0.4 kN), minimum, when tested in accordance with ASTM D4533/D4533M.
- C. Geotextile for Filtration: Capable of allowing liquid passage while restricting solids.
 - 1. Type: Nonwoven.
 - 2. Seams: Mechanically sewn.
 - a. Overlap: 3 inches (7.6 cm).
 - b. Stitch: Flat; continuous; tied off at ends.
 - c. Strength: 85 percent of grab, minimum, according to ASTM D4632/D4632M.
 - d. Limit seams perpendicular to the direction of construction.
 - 3. Grab Strength: 300 lb (1.3 kN), minimum, when tested in accordance with ASTM D4632/D4632M.
 - 4. Permittivity: 0.5 per second, minimum, ASTM D4491/D4491M.
 - 5. Apparent Opening Size: No.40 (0.425 mm), maximum, when tested in accordance with ASTM D4751.
 - 6. Sewn Seam Strength: 275 lb (1.25kN), minimum, when tested in accordance with ASTM D4632/D4632M
 - 7. Trapezoid Tear Strength: 100 lb (0.4 kN), minimum, when tested in accordance with ASTM D4533/D4533M.
 - 8. Puncture Strength: 450 lb (2.0 kN), minimum, when tested in accordance with ASTM D4833/D4833M.
- D. Geotextile for Protection: Capable of absorbing and dissipating stress.
 - 1. Type: Woven.
 - 2. Seams: Mechanically sewn.
 - a. Overlap: 3 inches (7.6 cm).
 - b. Stitch: Flat; continuous; tied off at ends.
 - c. Strength: 85 percent of grab, minimum, according to ASTM D4632/D4632M.
 - d. Limit seams perpendicular to the direction of incline.
 - 3. Grab Strength: 500 lb (2.2 kN), minimum, when tested in accordance with ASTM D4632/D4632M.
 - 4. Puncture Strength: 650 lb (2.9 kN), minimum, when tested in accordance with ASTM D6241.

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5. Sewn Seam Strength: 300 lb (1.3 kN), minimum, when tested in accordance with ASTM D4632/D4632M.
 6. Trapezoid Tear Strength: 150 lb (0.7 kN), minimum, when tested in accordance with ASTM D4533/D4533M.
- E. Geotextile Accessories:
1. Seaming Thread: High-strength; as recommended by manufacturer; contrasting color.
 2. Anchoring Pins: As recommended by manufacturer.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify the receiving surface is smooth, without ruts or protrusions, and grades are according to design drawings.
- B. Verify the receiving surface is unsaturated and free of ponded water.
- C. Verify the geosynthetic is free of defects or flaws that may degrade physical performance.
- D. Verify that each geosynthetic member is uniquely marked identifying proper placement.

3.2 PREPARATION

- A. Remove vegetation, boulders, and rocks larger than 3/4 inch in size and other sharp objects in accordance with Section 31 1000.
- B. Remove unsuitable materials in accordance with Section 31 2316.
- C. Fill in holes, including stake holes, backfill, and fill in accordance with Section 31 2323.
- D. Grade as indicated on drawings in accordance with Section 31 2200.
- E. Compact smooth as indicated on drawings in accordance with Section 31 2323.

3.3 INSTALLATION

- A. General:
 1. Notify Architect/Engineer a minimum of 24 hours prior to installation.
 2. Prevent surface drainage from eroding under geosynthetic. Repair undermined areas prior to backfill.
 3. Position geosynthetic smooth and wrinkle free on prepared surface; unroll or unfold carefully, avoiding stretching.
 4. Secure geosynthetic to prevent movement or damage during installation.
 5. Perform seaming in adequate lighting. Seam each geosynthetic member immediately after final placement. Clean sheets of dust, dirt, and other foreign matter prior to seaming.
 6. Follow manufacturer's recommended installation procedures.
- B. Separation:
 1. Install geotextile according to manufacturer's recommendations.
 2. Lay sheets in the direction of construction.
 3. Place adjacent geotextile and loosely fasten until seamed.
 4. Repairs: Remove damaged portion of geotextile and seam an additional layer to cover the affected area in all directions.
- C. Filtration:
 1. Install geotextile according to manufacturer's recommendations.

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2. Lay sheets in the direction of construction.
 3. Place adjacent geotextile and loosely fasten until seamed.
 4. Protect geotextile from surface runoff contamination prior to backfill.
 5. Repairs: Remove damaged portion of geotextile and seam an additional layer to cover the affected area in all directions. Replace geotextile where surface runoff contamination has occurred.
- D. Protection:
1. Install geotextile according to manufacturer's recommendations.
 2. Lay sheets in the direction of incline.
 3. Place adjacent geotextile and loosely fasten until seamed.
 4. Anchor Trench:
 - a. Excavate with rounded corners, remove vegetation, boulders, and rocks larger than 3/4 inch in size, and other sharp objects in accordance with Section 31 2316.13.
 - b. Location: Crest of slopes.
 - c. Edge Distance: 3 ft (1 m).
 - d. Size: 2 ft (0.6 m) wide by 3 ft (0.9 m) deep.
 - e. Remove ponded water in trench while open.
 - f. Backfill in accordance with Section 31 2323.
 5. Place terminal ends within anchor trench and secure with backfill.
 6. Repairs: Remove damaged portion of geotextile and seam an additional layer to cover the affected area in all directions.

3.4 BACKFILL

- A. Obtain approval for geosynthetic sheet installation from Architect/Engineer before placing fill.
- B. Backfill in a manner to prevent damage to geosynthetic. Repair geosynthetic damaged during backfill operations.
- C. Cover geosynthetic in the installed direction in accordance with Section 31 2323.
 1. Cover geosynthetic within time limits specified by manufacturer.
 2. Drive only on earth cover and use only rubber-tired or rubber-tracked vehicles.
 3. Lift Thickness: 12 inches.

3.5 FIELD QUALITY CONTROL

- A. See Section 01 4000 - Quality Requirements for additional requirements.
- B. Provide manufacturer's field representative at all times during geosynthetic installation.
- C. Inspect completed liner for pinholes, punctures, and tears; inspect seams and joints for unbonded areas. Repair any defects or damages found.
- D. Perform one interface friction test for each geosynthetic and backfill combination in accordance with ASTM D5321/D5321M. Provide results to the Architect.
- E. Leakage Testing: Test barrier for leakage according to ASTM D7877.
- F. Product Conformance Testing: Confirm geosynthetic supplied meets design requirements according to ASTM D4595.

3.6 PROTECTION

- A. Do not exceed geosynthetic manufacturer's recommended exposure to UV radiation.
- B. Prevent surface water runoff from contaminating geosynthetic.

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- C. Do not use pins or staples where risk of damaging underlying geosynthetic layer is present.
- D. Erect barricades to prevent traffic over geosynthetic before it is filled.

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END OF SECTION 31 0519

**SECTION 31 1000
SITE CLEARING**

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Clearing and grubbing.
- B. Selective removal and trimming.
- C. Earth stripping and stockpiling.
- D. Repair and restoration.
- E. Debris removal.

1.2 RELATED REQUIREMENTS

- A. Section 02 4119 Selective Demolition: Removal of built elements and utilities.
- B. Section 31 2323 - Fill: Material for filling holes, pits, and excavations generated as result of removal operations.
- C. Section 32 9300 - Plants: Relocation of existing trees, shrubs, and other plants; pruning.

1.3 REFERENCE STANDARDS

- A. 29 CFR 1910.266 - Logging Operations; Current Edition.
- B. ANSI A300 Part 1 - American National Standard for Tree Care Operations - Tree, Shrub, and Other Woody Plant Management - Standard Practices (Pruning); 2017.
- C. ANSI A300 Part 5 - American National Standard for Tree Care Operations – Tree, Shrub and Other Woody Plant Maintenance Standard Practices (Management of Trees and Shrubs During Site Planning, Site Development, and Construction); 2019.
- D. ANSI A300 Part 6 - Tree, Shrub, and Other Woody Plant Management--Standard Practices (Planting and Transplanting); 2012 (Reapproved 2018).
- E. ANSI Z133 - American National Standard for Arboricultural Operations - Safety Requirements; 2017.

1.4 ADMINISTRATIVE REQUIREMENTS

- A. Preinstallation Meeting: Convene prework meeting one week prior to start of work of this section; require attendance by affected personnel.
- B. Sequencing: Ensure utility disconnections are in orderly and expeditious manner.

1.5 SUBMITTALS

- A. See Section 01 3300 - Submittal Procedures, for submittal procedures.
- B. Site Plan:
 - 1. Indicate vegetation removal limits.
 - 2. Indicate areas for temporary construction and field offices.

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- 3. Indicate permanent features to be removed and replaced or removed and salvaged.
- C. Clearing Firm Qualification Statement: Documentation of specialized experience.
- D. TCIA Installer Qualification Statement: Documentation of Tree Care Industry Association Accreditation.
- E. Existing Conditions Report: Written documentation of vegetation to remain, see Section 01 3000 - Administrative Requirements (NOT TO BE USED FOR GRESHAM SMITH PROJECTS, USE 01 3100).
- F. Photographs: Photographic documentation of existing vegetation.

1.6 QUALITY ASSURANCE

- A. Clearing Firm Qualifications: Company specializing in performing work of type specified and with at least five years of documented experience.
- B. Trimming or Pruning Qualifications: Tree Care Industry Association (TCIA) Certified Treecare Safety Professional.

1.7 FIELD CONDITIONS

- A. Ambient Conditions: Terminate work during hazardous environmental conditions according to 29 CFR 1910.266.
- B. Existing Conditions: See site and utility survey, existing conditions survey, and site drawing; see Section 00 3100 - Available Project Information.
- C. Traffic: Comply with other requirements specified in Section 01 5500 - Vehicular Access and Parking.
- D. Temporary Erosion and Sediment Control: Comply with other requirements specified in Section 01 5713 - Temporary Erosion and Sediment Control.

PART 2 PRODUCTS

2.1 MATERIALS

- A. Sedimentation Barrier: See Section 01 5713 - Temporary Erosion and Sediment Control.
- B. Tree Wound Compound: Application capable of sealing vegetation wounds and grafts.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Comply with additional requirements specified in Section 01 7000 - Execution and Closeout Requirements.
- B. Identify potential runoff areas.
- C. Construction Fencing: See Section 01 5000 - Temporary Facilities and Controls.
- D. Boundary Demarcations: See Section 01 7123 - Field Engineering.
- E. Identify potential dust sources.
- F. Identify preexisting debris, junk, and trash on-site.

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3.2 PREPARATION

- A. Coordinate work with utility companies; notify before starting work and comply with local requirements; obtain required permits.
- B. Protect existing utilities to remain from damage.
- C. Do not disrupt public utilities without permit from authority having jurisdiction.
- D. Protect existing structures and other elements that are to remain.
- E. Protect existing vegetation to remain from damage and monitor according to ANSI A300 Part 5.
 - 1. Photograph vegetation with documentation indicating data, time, weather, and brief description of health condition.
- F. Install sedimentation barrier according to Section 01 5713 - Temporary Erosion and Sediment Control.
- G. Develop dust remediation controls and methods. Do not use water if that results in ice, flooding, sedimentation of public waterways or storm sewers, or other pollution.
- H. Remove preexisting debris, junk, and trash on-site.

3.3 CLEARING AND GRUBBING

- A. Clearing: Cut trees, stumps, shrubs, downed timber, and other vegetation for removal within identified area as indicated on drawings according to 29 CFR 1910.266. Follow recommendations of ANSI Z133 and best local practices for species involved.
- B. Clear site after relocating vegetation in accordance with ANSI A300 Part 6.
- C. Do not remove or damage vegetation beyond limits indicated on drawings.
 - 1. Building Perimeter: 40 feet outside.
 - 2. Minor Utility Trenches: 10 feet each side of utility lines less than 12 inches in diameter.
 - 3. Roadways and Main Utility Trenches: 15 feet each side.
 - 4. Pervious Paving: 25 feet outside perimeter.
- D. In areas where vegetation must be removed but no construction will occur other than pervious paving, remove vegetation with minimum subsoil disturbance.
- E. Grubbing: Remove stumps, roots, buried timber, and other vegetation minimum depth 12 inches (30 cm) from ground. Remove rocks minimum depth 6 inches (15 cm) from ground.

3.4 SELECTIVE REMOVAL AND TRIMMING

- A. Selective Removal: Individual tree and shrub identified for removal as indicated on drawings according to 29 CFR 1910.266.
 - 1. Includes trees, stumps, shrubs, downed timber, and other vegetation identified for removal as indicated on drawings.
 - 2. Fell trees away from vegetation identified to remain.
 - 3. Pull stumps, remove roots, buried timber, and other vegetation identified for removal 12 inches (30 cm), minimum depth, from ground. Remove rocks 6 inches (15 cm), minimum depth, from ground.
 - 4. Cut stump neatly and close to ground. Apply tree stump killer according to manufacturer's recommendations.
 - 5. Fill holes left by removal of stumps and roots, using suitable fill material, with top surface neat in appearance and matching existing grade.

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- B. Selective Trimming: Individual limbs and branches cut back according to ANSI A300 Part 1 identified for removal as indicated on drawings. Follow recommendations of ANSI Z133 and best local practices for species involved.

3.5 EARTH STRIPPING AND STOCKPILING

- A. Stripping:
 - 1. Cut sod into portable sections for undamaged removal.
 - 2. Record topsoil depth at rate of five measurements per acre or within each identified area as indicated on drawings.
 - 3. Remove topsoil within identified area:
 - a. 4 inches (10 cm) deep.
- B. Stockpiling:
 - 1. Place sod in identified areas determined at preinstallation meeting.
 - 2. Place topsoil in identified areas determined at preinstallation meeting:
 - a. Pile depth not to exceed 8 feet.
 - b. Protect piles from erosion.
 - 3. Place rock in identified areas determined at preinstallation meeting.

3.6 REMOVED VEGETATION PROCESSING

- A. Do not burn, bury, landfill, or leave on-site, except as indicated on drawings.
- B. Trees: Sell if marketable.
- C. Sod: Reuse on-site if possible; otherwise sell if marketable.
- D. Chip, grind, crush, or shred vegetation for mulching, composting, or other purposes; give preference to on-site uses.

3.7 REPAIR AND RESTORATION

- A. Remaining Existing Facilities, Utilities, and Site Features: If damaged due to this work, repair or replace to original condition.
- B. Vegetation: Replace damaged or destroyed vegetation identified to remain as indicated on drawings at no cost to Owner:
 - 1. Outside removal limits.
 - 2. Inside protection limits.
- C. Apply tree wound compound according to manufacturer's recommendations.

3.8 DEBRIS REMOVAL

- A. Remove debris, junk, and trash from site.
- B. Leave site in clean condition, ready for subsequent work.
- C. Clean up spillage and windblown debris from public and private lands.

3.9 CLEANING

- A. See Section 01 7000 - Execution and Closeout Requirements for additional requirements.
- B. Remove unused stockpiled subsoil. Grade stockpile area to prevent standing water.

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- C. Leave site clean and ready to receive work.

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END OF SECTION 31 1000

**SECTION 31 2200
GRADING**

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Rough grading.
- B. Fine grading.

1.2 RELATED REQUIREMENTS

- A. Section 31 1000 - Site Clearing.
- B. Section 31 2316 - Excavation.
- C. Section 31 2316.26 - Rock Removal.
- D. Section 31 2323 - Fill.
- E. Section 32 9119 - Landscape Grading.

1.3 PRICE AND PAYMENT PROCEDURES

1.4 REFERENCE STANDARDS

- A. 29 CFR 1910.266 - Logging Operations; Current Edition.
- B. ASTM D2487 - Standard Practice for Classification of Soils for Engineering Purposes (Unified Soil Classification System); 2017, with Editorial Revision (2020).

1.5 SUBMITTALS

- A. Project Record Documents: Accurately record actual locations of utilities remaining by horizontal dimensions, elevations or inverts, and slope gradients.

1.6 QUALITY ASSURANCE

- A. Perform in accordance with State of TENNESSEE, Highway Department standards.
 - 1. Maintain one copy on-site.

1.7 FIELD CONDITIONS

- A. Ambient Conditions: Terminate work during hazardous environmental conditions in accordance with 29 CFR 1910.266.
- B. Existing Conditions: See site and utility survey, existing conditions survey, and site drawing; see Section 00 3100 - Available Project Information.

PART 2 PRODUCTS

2.1 MATERIALS

- A. Gravel: Excavated on-site.

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1. Graded according to ASTM D2487 Group Symbol GW, GP, or SP.
- B. Other Fill Materials: See Section 31 2323.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify survey benchmark and intended elevations for grading areas are as indicated.
- B. Verify the absence of standing or ponding water.

3.2 PREPARATION

- A. Identify required lines, levels, contours, and datum.
- B. Stake and flag locations of known utilities.
- C. Locate, identify, and protect above- and below-grade utilities to remain.
- D. Notify utility company to remove and relocate utilities.
- E. Provide temporary means and methods to remove standing or ponding water from areas prior to grading.
- F. Protect site features to remain, including but not limited to benchmarks, survey control points, and fences.
- G. Remove topsoil in accordance with Section 31 1000.
- H. Excavate materials in accordance with Section 31 2316.
- I. Remove rock in accordance with Section 31 2316.26.
- J. Fill and backfill in accordance with Section 31 2323.

3.3 ROUGH GRADING

- A. Excavate and fill subgrade material to elevations indicated on plans.
- B. Horizontally bench existing slopes greater than 1:4.
- C. Replace displaced subgrade in accordance with Section 31 2323.
- D. Remove and replace unsuitable materials as specified fill.
- E. See Section 31 2316 for stockpiling procedures.

3.4 FINE GRADING

- A. Scrape and spread subgrade material uniformly smooth and without disruptions as indicated on drawings.
- B. Slopes: Transition smoothly to adjacent areas.
- C. See Section 31 2323 for final compaction.

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3.5 TOLERANCES

- A. Top Surface: Plus or minus 1/2 inch.

3.6 CLEANING

- A. See Section 01 7000 - Execution and Closeout Requirements for additional requirements.
- B. Remove unused stockpiled subsoil. Grade stockpile area to prevent standing water.
- C. Leave site clean and raked, ready to receive work.

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END OF SECTION 31 2200

**SECTION 31 2316
EXCAVATION**

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Excavating for site structures and sidewalks.
- B. Trenching for utilities.
- C. Temporary excavation support and protection systems.

1.2 RELATED REQUIREMENTS

- A. Section 01 5713 - Temporary Erosion and Sediment Control: Slope protection and erosion control.
- B. Section 01 7000 - Execution and Closeout Requirements: Project conditions; protection of benchmarks, survey control points, and existing construction to remain; reinstallation of removed products; temporary bracing and shoring. General requirements for dewatering of excavations and water control.
- C. Section 31 1000 - Site Clearing: Vegetation and existing debris removal; topsoil removal.
- D. Section 31 2200 - Grading: Grading.
- E. Section 31 2316.13 - Trenching: Excavating for utility trenches.
- F. Section 31 2316.26 - Rock Removal: Removal of rock during excavating.
- G. Section 31 2323 - Fill: Fill materials, backfilling, and compacting.
- H. Section 31 3700 - Riprap.
- I. Section 32 9119 - Landscape Grading.

1.3 REFERENCE STANDARDS

- A. 29 CFR 1926 - Safety and Health Regulations for Construction; Current Edition.

1.4 SUBMITTALS

- A. See Section 01 3300 - Submittal Procedures, for submittal procedures.
- B. Temporary Support and Excavation Protection Plan.
- C. Project Record Documents: Record drawings at project closeout according to 01 7000 - Execution and Closeout Requirements. Show locations of installed support materials left in place, including referenced locations and depths, on drawings.
- D. Field Quality Control Submittals: Document visual inspection of load-bearing excavated surfaces.

1.5 QUALITY ASSURANCE

- A. Temporary Support and Excavation Protection Plan:
 - 1. Indicate sheeting, shoring, and bracing materials and installation required to protect excavations and adjacent structures and property.
 - 2. Include drawings and calculations for bracing and shoring.

- 3. Bracing and shoring design to meet requirements of OSHA's Excavation Standard, 29 CFR 1926, Subpart P.
- B. Designer Qualifications: For design of temporary shoring and bracing, employ a Professional Engineer experienced in design of this type of work and licensed in the State in which the Project is located.
- C. Shoring Installer Qualifications: Company specializing in performing the shoring and bracing work of this section with a minimum of 5 years of documented experience.

PART 2 PRODUCTS

2.1 MATERIALS

- A. Bedding and Fill to Correct Over-Excavation:
 - 1. See Section 31 2323 for bedding and corrective fill materials at general excavations.
 - 2. See Section 31 2316.13 for bedding and corrective fill materials at utility trenches.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify that survey benchmark and intended elevations for the work are as indicated.
- B. Survey existing adjacent structures and improvements and establish exact elevations at fixed points to act as benchmarks.
- C. Determine the prevailing groundwater level prior to excavation. If the proposed excavation extends less than 1 foot into the prevailing groundwater, control groundwater intrusion with perimeter drains routed to sump pumps, or as directed by Architect/Engineer. If the proposed excavation extends more than 1 foot into the prevailing groundwater, control groundwater intrusion with comprehensive dewatering procedures, or as directed by Geotechnical Engineer.

3.2 PREPARATION

- A. Identify required lines, levels, contours, and datum locations.
- B. See Section 31 1000 for clearing, grubbing, and topsoil removal.
- C. Locate, identify, and protect utilities that remain and protect from damage.
- D. Notify utility company to remove and relocate utilities.
- E. Protect benchmarks, survey control points, existing structures, fences, sidewalks, paving, and curbs from excavating equipment and vehicular traffic.
- F. Protect plants, lawns, rock outcroppings, and other features to remain.
- G. Grade top perimeter of excavation to prevent surface water from draining into excavation. Provide temporary means and methods, as required, to maintain surface water diversion until no longer needed, or as directed by Architect.
- H. See Sections 01 7000 and 02 4100 for underpinning and shoring of adjacent structures that could be damaged by excavating work.

3.3 TEMPORARY EXCAVATION SUPPORT AND PROTECTION

- A. Excavation Safety: Comply with OSHA's Excavation Standard, 29 CFR 1926, Subpart P.

1. Excavations in stable rock or in less than 5 feet in depth in ground judged as having no cave-in potential do not require excavation support and protection systems.
2. Depending upon excavation depth, time that excavation is open, soil classification, configuration and slope of excavation sidewalls, design and provide an excavation support and protection system that meets the requirements of 29 CFR 1926, Subpart P:
 - a. Sloping and benching systems.
 - b. Support systems, shield systems, and other protective systems.
- B. Leave excavation support and protection systems, used as formwork or within 10 feet of existing foundations, permanently in place, unless otherwise noted.
 1. Cut off top 4 feet below grade, abandon remainder.
- C. Excavation support and protection systems not required to remain in place may be removed subject to approval of Owner or Owner's Representative.
 1. Remove temporary shoring and bracing in a manner to avoid harmful disturbance to underlying soils and damage to buildings, structures, pavements, facilities and utilities.

3.4 EXCAVATING

- A. Excavate to accommodate new structures and construction operations.
 1. Excavate to the specified elevations.
 2. Excavate to the length and width required to safely install, adjust, and remove any forms, bracing, or supports necessary for the installation of the work.
 3. Cut utility trenches wide enough to allow inspection of installed utilities.
 4. See Section 31 2316.26 for required excavation clearances for pipes in utility trenches.
 5. Hand trim excavations. Remove loose matter.
- B. Notify Architect/Engineer of unexpected subsurface conditions and discontinue affected Work in area until notified to resume work.
- C. Do not interfere with 45 degree bearing splay of foundations.
- D. Remove lumped subsoil, boulders, and rock up to 1/3 cubic yard measured by volume. See Section 31 2316.26 for removal of larger material.
- E. Provide temporary means and methods, as required, to remove all water from excavations until directed by Architect/Engineer. Remove and replace soils deemed suitable by classification and which are excessively moist due to lack of dewatering or surface water control.

3.5 FILLING AND BACKFILLING

- A. Do not fill or backfill until all debris, water, unsatisfactory soil materials, obstructions, and deleterious materials have been removed from excavation.
- B. Install underground warning tape at buried utilities according to Sections 21 0553, 22 0553, 23 0553, and 26 0553.
- C. See Section 31 2316.13 for fill, backfill, and compaction requirements at utility trenches.
- D. See Section 31 2200 for rough and fine grading.
- E. See Section 32 9119 for topsoil placement and finish grading.

3.6 REPAIR

- A. Correct areas that are over-excavated and load-bearing surfaces that are disturbed; see Section 31 2323.

3.7 FIELD QUALITY CONTROL

- A. See Section 01 4000 - Quality Requirements, for general requirements for field inspection and testing.
- B. Provide for visual inspection of load-bearing excavated surfaces by Architect before placement of foundations.

3.8 CLEANING

- A. Stockpile excavated material to be re-used in area designated on site in accordance with Section 31 2200.
- B. Remove excavated material that is unsuitable for re-use from site.
- C. Remove excess excavated material from site.

3.9 PROTECTION

- A. Divert surface flow from rains or water discharges from the excavation.
- B. Prevent displacement of banks and keep loose soil from falling into excavation; maintain soil stability.
- C. Protect open excavations from rainfall, runoff, freezing groundwater, or excessive drying so as to maintain foundation subgrade in satisfactory, undisturbed condition.
- D. Protect bottom of excavations and soil adjacent to and beneath foundation from freezing.
- E. Keep excavations free of standing water and completely free of water during concrete placement.

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END OF SECTION 31 2316

**SECTION 31 2316.13
TRENCHING AND BACKFILLING**

SUMMARY

1.1 SECTION INCLUDES:

- A. Excavating trenches for utilities.
- B. Compacted fill from top of utility bedding **to subgrade elevations**.
- C. Backfilling and compaction.

1.2 RELATED SECTIONS:

- A. Section 01 2219 – Measurement and Payment
- B. Section 31 2213 - Rough Grading: Topsoil and subsoil removal from site surface.
- C. Section 31 2316 - Excavation: General building excavation.
- D. Section 31 2316.26 - Rock Removal: Removal of rock during excavating.
- E. Section 31 2323 - Fill: General backfilling.
- F. Section 31 3700 - Riprap.
- G. Section 32 9119 - Landscape Grading: Filling of topsoil over backfilled trenches to finish grade elevation.
- H. Section 33 3113 – Site Sanitary Sewerage Gravity Piping: Sanitary sewer piping and bedding.
- I. Section 33 4000 – Stormwater Drainage: Storm sewer piping and bedding.

1.3 REFERENCES

- A. American Association of State Highway and Transportation Officials:
 - 1. AASHTO T180 - Standard Specification for Moisture-Density Relations of Soils Using a 4.54-kg (10-lb) Rammer and a 457-mm (18-in.) Drop.
- B. ASTM International:
 - 1. ASTM D698 - Standard Test Method for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft³ (600 kN-m/m³).
 - 2. ASTM D1556 - Standard Test Method for Density and Unit Weight of Soil in Place by the Sand-Cone Method.
 - 3. ASTM D1557 - Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft³ (2,700 kN-m/m³).
 - 4. ASTM D2167 - Standard Test Method for Density and Unit Weight of Soil in Place by the Rubber Balloon Method.
 - 5. ASTM D2922 - Standard Test Method for Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth).
 - 6. ASTM D3017 - Standard Test Method for Water Content of Soil and Rock in Place by Nuclear Methods (Shallow Depth).

1.4 DEFINITIONS

- A. Utility: Any buried pipe, duct, conduit, or cable.

1.5 SUBMITTALS

- A. Section 01 3300 - Submittal Procedures: Requirements for submittals.
- B. Excavation Protection Plan: Describe sheeting, shoring, and bracing materials and installation required to protect excavations and adjacent structures and property; include structural calculations to support plan.
- C. Product Data: Submit data for geotextile fabric indicating fabric and construction.
- D. Samples: Submit, in air-tight containers, **10 lb** sample of **each type of** fill to testing laboratory.
- E. Materials Source: Submit name of imported fill materials suppliers.
- F. Product Data: submit sieve analysis data for embedment and backfill to be placed in pipe zone.
- G. Manufacturer's Certificate: Certify **Products** meet or exceed **specified requirements**.

1.6 QUALITY ASSURANCE

- A. Perform Work in accordance with City of Athens Public Work's **standard**.
- B. Maintain **one copy** of **each** document on site.

1.7 QUALIFICATIONS

- A. Prepare excavation protection plan under direct supervision of Professional Engineer experienced in design of this Work and licensed **in State of Tennessee**.

1.8 FIELD MEASUREMENTS

- A. Verify field measurements prior to fabrication.

1.9 COORDINATION

- A. Section 013000 - Administrative Requirements: Coordination and project conditions.
- B. Verify Work associated with lower elevation utilities is complete before placing higher elevation utilities.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

3.1 LINES AND GRADES

- A. Lay pipes to lines and grades indicated on Drawings.
 - 1. **Engineer/Owner** reserves right to make changes in lines, grades, and depths of utilities when changes are required for Project conditions.
- B. Use laser-beam instrument with qualified operator to establish lines and grades.

3.2 PREPARATION

- A. Identify required lines, levels, contours, and datum locations. Establish extent of excavation by line and elevation. Maintain benchmarks, monuments and other reference points.
- B. Protect plant life, lawns, **rock outcropping** and other features remaining as portion of final landscaping.

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- C. Protect benchmarks, **existing structures, fences**, sidewalks, paving, and curbs from excavating equipment and vehicular traffic.
- D. Maintain and protect above and below grade utilities indicated to remain.
- E. Establish temporary traffic control **and detours** when trenching is performed in public right-of-way. Relocate controls **and reroute traffic** as required during progress of Work.
- F. Clearing and Grubbing. Contractor shall do all clearing and grubbing necessary for construction operations. All materials cleared and grubbed shall be disposed of properly.

3.3 UTILITIES

- A. Call Local Utility Line Information service at not less than **three** working days before performing Work.
 - 1. Request underground utilities to be located and marked within and surrounding construction areas.
- B. As excavation approaches utilities, hand excavate to uncover utilities
- C. Notify the Engineer for direction prior to removal and/or relocation of utility companies lines which are in the way of excavation.
- D. Maintain, reroute or extend as required existing utility lines to remain which pass through the work area with the approval of Owner. Relocations are at the Contractor's cost.
- E. Accurately locate and record abandoned and active lines rerouted or extended to Record Drawings

3.4 TRENCHING

- A. Excavate subsoil required for utilities installation.
- B. Remove lumped subsoil, boulders, and rock up of **1/6** cubic yard, measured by volume. Remove larger material as specified in Section **31 2318**.
- C. Perform excavation within **24** inches of existing **utility service** in accordance with **utility's** requirements.
- D. Do not advance open trench more than **200** feet ahead of installed pipe.
- E. Cut trenches **sufficiently wide to enable installation and allow inspection**. Remove water or materials that interfere with Work. Trim and shape trench bottoms and leave free of irregularities, lumps and projections. Over-excavated trench depths shall be filled to the proper grade with crushed rock at no additional cost to Owner.
- F. Excavate bottom of trenches a maximum **2** feet wider than outside diameter of pipe. The walls of the excavation above the pipe zone may be laid back where room exists, as necessary, and shall be constructed according to OSHA, federal, state, and municipal regulations.
- G. Excavate trenches to depth indicated on Drawings. Provide uniform and continuous bearing and support for bedding material, **pipes, and utilities**.
- H. Do not disturb soil within branch spread of existing trees or shrubs that are to remain. If it is necessary to excavate through roots, perform work by hand and cut roots with sharp axe or sharp pruner.
- I. When Project conditions permit, slope side walls of excavation starting **2** feet above top of pipe. When side walls can not be sloped, provide sheeting and shoring to protect excavation as specified in this section.
- J. When subsurface materials at bottom of trench are loose or soft, **excavate to greater depth as directed by Engineer** until suitable material is encountered.

- K. The trench shall be excavated to an even grade to permit the installation of pipe such that the full length of the pipe barrel is supported on the proper depth of granular embedment material.
- L. Cut out soft areas of subgrade not capable of compaction in place. If subgrade is soft, spongy or disintegrated, the materials shall be removed until a firm, stable and uniform bearing is reached and the subgrade brought back to the required grade with crushed stone embedment material compacted in place or with concrete. Backfill with Fill Type required and compact to density equal to or greater than requirements for subsequent backfill material.
- M. Trim excavation. **Hand trim for bell and spigot pipe joints.** Remove loose matter.
- N. Correct over excavated areas with compacted backfill as specified for authorized excavation or replace with fill concrete as directed by Engineer.
- O. Remove excess subsoil not intended for reuse from site.
- P. Unsuitable excavated subsoil including perishable, spongy material, large rock or other material designated by Owner shall not be used in backfilling. Unsuitable material shall be disposed of by the Contractor in a manner approved by Owner.
- Q. Stockpile subsoil in area designated on site to depth not exceeding **8** feet and protect from erosion.

3.5 SHEETING AND SHORING

- A. In caving ground or in wet, saturated or flowing, or otherwise unsuitable materials, the sides of all trenches and excavation shall be adequately sheeted and braced to maintain the excavation from slides or cave-ins to provide safety for workman.
- B. Sheet, shore, and brace excavations to prevent danger to persons, structures and adjacent properties and to prevent caving, erosion, and loss of surrounding subsoil.
- C. Support trenches more than **5** feet deep excavated through unstable, loose, or soft material. Provide sheeting, shoring, bracing, or other protection to maintain stability of excavation.
- D. Design sheeting and shoring to be removed at completion of excavation work.
- E. Repair damage caused by failure of the sheeting, shoring, or bracing and for settlement of filled excavations or adjacent soil.
- F. Repair damage to **new and existing** Work from settlement, water or earth pressure or other causes resulting from inadequate sheeting, shoring, or bracing.

3.6 BACKFILLING

- A. Backfill trenches to contours and elevations with unfrozen fill materials.
- B. Ensure trenches are free of building debris, snow, ice, and that ground surfaces are not in a frozen condition.
- C. Systematically backfill to allow maximum time for natural settlement. Do not backfill over porous, wet, frozen, or spongy subgrade surfaces.
- D. Place material in continuous layers as follows:
 - 1. Subsoil Fill: Maximum **8** inches compacted depth.
 - 2. Structural Fill: Maximum **6** inches compacted depth.
 - 3. Granular Fill: Maximum **6** inches compacted depth.
- E. Employ placement method that does not disturb or damage utilities in trench.

- F. Maintain optimum moisture content of fill materials to attain required compaction density.
- G. Do not leave more than 50 feet of trench open at end of working day.
- H. Protect open trench to prevent danger to **the public**.

3.7 COMPACTION

- A. Compact embedment materials with hand-operated mechanical compaction devices.
- B. All embedment materials, which includes material placed in trench bottom for pipe foundation, and all backfill material within the pipe zone shall be compacted to a minimum of 95 percent of maximum dry density defined by ASTM D698 or to a minimum of 75 percent relative density determined by ASTM D4253 and D4254, whichever is applicable.
- C. Outside Paved Areas: Backfill materials shall be thoroughly compacted by mechanical or pneumatic tamping in layers not to exceed 9 inches in compacted thickness. Care must be taken to avoid pipe damage. Compact backfill material to 85 percent (minimum) standard Proctor (ASTM D698).
- D. Within Paved Areas. Backfill under roads shall be mechanically or pneumatically compacted to 95 percent of maximum dry density as defined as ASTM D698 in layers not exceeding 6 inches of compacted thickness
- E. Remove and replace improperly compacted backfill material at no cost to Owner.
- F. Water jetting for consolidation will not be permitted.
- G. Compact backfill and embedment materials at moisture contents of optimum to ± 3 percent t of optimum for cohesive materials and as necessary to achieve specified density for noncohesive materials. Contractor shall provide compaction tests at a minimum of every 150 feet of trench length per lift and as deemed necessary for Contractor to ensure adequate compaction is being achieved. Contractors compaction tests shall be performed at Contractors sole expense and will be considered subsidiary to construction
- H. Additional compaction tests at intervals of 500 feet of trench length and vertical intervals of 10 feet of backfill depth may be directed by Owner at Owner's expense. If Owner provided tests determine that embedment or backfill does not meet required density Contractor shall recompact embedment until densities are met or shall remove all embedment and add new embedment to meet the densities. The Contractor shall pay the cost of all additional retesting required by Owner.
- I. Field Density Testing - Embedment Test Section:
 - 1. The Contractor shall coordinate with Owner trial test sections. The trial test section shall consist of at least two sections (joints, lengths) of pipe. The pipe shall be installed and the Contractor shall use his proposed method of placing and compacting the embedment.
 - 2. At least one length of pipe shall be carefully removed to allow the integrity of embedment along the haunches and below the pipe to be evaluated visually and by in-place density testing to verify that the Contractors method will achieve the specified density and uniformity of the embedment materials, or if the Contractor proposes to change methods of placement and compaction.
 - 3. The means, methods, and techniques of placement and compaction shall be the sole responsibility of Contractor, and the test sections shall be considered only as a means to verify that the Contractor methods are capable of achieving the specified density.
 - 4. The actual quality of the embedment and backfill, as compacted, shall be the responsibility of the Contractor and satisfactory results from the test section(s) and field density tests shall not be considered as a guarantee of the quality of the Contractors embedment and backfill operations.

3.8 TOLERANCES

- A. Section 014000 - Quality Requirements: Tolerances.

- B. Top Surface of Backfilling **Under Paved Areas**: Plus or minus **1** inch from required elevations.
- C. Top Surface of General Backfilling: Plus or minus **1** inch feet from required elevations.

3.9 FIELD QUALITY CONTROL

- A. Section **01 4000 - Quality Requirements** and **01 7000 - Execution and Closeout Requirements**: Field inspecting, testing, adjusting, and balancing.
- B. Perform laboratory material tests in accordance with **ASTM D1557, ASTM D698, AASHTO T180**.
- C. Perform in place compaction tests in accordance with the following:
 - 1. Density Tests: **ASTM D1556, ASTM D2167, or ASTM D2922**.
 - 2. Moisture Tests: **ASTM D3017**.
- D. When tests indicate Work does not meet specified requirements, **remove Work, replace, compact, and retest**.

3.10 PROTECTION OF FINISHED WORK

- A. Section **01 7000 - Execution and Closeout Requirements**: Protecting finished work.
- B. Reshape and re-compact fills subjected to vehicular traffic during construction.

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END OF SECTION 31 2316.13

**SECTION 31 2316.26
ROCK REMOVAL**

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Removal of identified rock during excavation.

1.2 RELATED REQUIREMENTS

- A. Section 31 2323 - Fill: Fill materials.

1.3 DEFINITIONS

- A. Site Rock: Solid mineral material with a volume in excess of 1/3 cubic yard or solid material that cannot be removed with a 3/4 cubic yard capacity power shovel without drilling.
- B. Trench Rock: Solid mineral material with a volume in excess of 1/6 cubic yard or solid material that cannot be removed with a 1/2 cubic yard capacity power shovel without drilling.
- C. Rock: Solid mineral material of a size that cannot be removed with a 1/2 cubic yard capacity power shovel.

1.4 REFERENCE STANDARDS

- A. NFPA 495 - Explosive Materials Code; 2023.

1.5 SUBMITTALS

- A. See Section 01 3000 - Submittal Procedures, for submittal procedures.
- B. Shop Drawings: Indicate the proposed method of blasting, delay pattern, explosive types, type of blasting mat or cover, and intended rock removal method.

1.6 QUALITY ASSURANCE

- A. Seismic Survey Firm: Company specializing in seismic surveys with five years documented experience.
- B. Explosives Firm: Company specializing in explosives for disintegration of rock, with five years documented experience.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify site conditions and note subsurface irregularities affecting work of this section.

3.2 PREPARATION

- A. Identify required lines, levels, contours, and datum.

3.3 ROCK REMOVAL

- A. Excavate and remove rock by either mechanical or explosive methods.

- B. Mechanical Methods: Drill holes and utilize expansive tools to fracture rock.
- C. If rock is uncovered requiring the explosives method for rock disintegration, execute as follows:
 - 1. Provide seismographic monitoring during progress of blasting operations.
 - 2. Drill blasting holes within 12 feet of finished slope.
 - 3. Disintegrate rock and remove from excavation.
- D. Use of Explosives: Obtain permits from authorities having jurisdiction before explosives are brought to site or drilling is started.
 - 1. Comply with NFPA 495 and applicable state and local codes.
 - 2. Prior to blasting, obtain a seismographic survey to determine maximum charges that can be used at each location in area of excavation without damaging adjacent properties or other work.
 - 3. Prior to executing seismographic survey, advise owners of adjacent buildings and structures in writing; explain planned survey and blasting operations.
 - 4. Prior to blasting, document conditions of buildings near locations of intended blasting and photograph existing conditions identifying existing irregularities.
 - 5. Schedule work to avoid working hours of occupied buildings nearby.
- E. Form level bearing at bottom of excavations.
- F. Remove shaled layers to provide sound and unshattered base for footings.
- G. In utility trenches, excavate to 6 inches below invert elevation of pipe and 24 inches wider than pipe diameter.
- H. Remove excavated materials from site.
- I. Correct unauthorized rock removal in accordance with backfilling and compacting requirements of Section 31 2323.
- J. Correct unauthorized rock removal to directions of Architect/Engineer.

3.4 FIELD QUALITY CONTROL

- A. Independent agency field inspection will be provided under provisions of Section 01 4000 - Quality Requirements.
- B. Provide for visual inspection of foundation bearing surfaces and cavities formed by removed rock.

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END OF SECTION 31 2316.26

**SECTION 31 2319
DEWATERING**

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Installation.
- B. Operation.
- C. Water disposal.
- D. Closeout activities.

1.2 RELATED REQUIREMENTS

- A. Section 31 2316 - Excavation.
- B. Section 31 2316.13 – Trenching and Backfilling.

1.3 REFERENCE STANDARDS

- A. 29 CFR 1926 - Safety and Health Regulations for Construction; Current Edition.

1.4 ADMINISTRATIVE REQUIREMENTS

- A. Coordination: Coordinate dewatering with excavation.
- B. Preinstallation Meetings: Review site conditions, proposed excavation, existing utilities, and geotechnical report with Architect/Engineer.

1.5 SUBMITTALS

- A. See Section 01 3100 for submittal procedures.
- B. Shop Drawings: Plans with equipment arrangement indicating collection and disposal areas.
- C. Design Data: Include plans, elevations, sections, details, and calculations showing system certified by licensed professional Architect/E.
- D. Designer's qualification statement.
- E. Installer's qualification statement.
- F. Field Quality Control Submittals:
 - 1. Document water level measurements.
 - 2. Document existing structure survey results.
 - 3. Document visual inspections of dewatering.
- G. Project Record Documents: Record drawings at project closeout; see Section 01 7000 - Execution and Closeout Requirements. On drawings, indicate locations of installed wells and well points left in place, including referenced locations and depths.

1.6 QUALITY ASSURANCE

- A. Designer Qualifications: Perform design under direct supervision of professional engineer experienced in design of this type of work and licensed in the State in which the Project is located.
- B. Installer Qualifications: Company specializing in performing work of type specified and with at least 3 years of documented experience.
- C. Documents at Project Site: Maintain at project site one copy of shop drawings.

1.7 FIELD CONDITIONS

- A. Existing Conditions: See site and utility survey, geotechnical report, hazardous material survey, existing conditions survey, and site drawing; see Section 00 3100 - Available Project Information.
- B. Discharge Water: Comply with requirements, see Section 01 5713 - Temporary Erosion and Sediment Control.

PART 3 EXECUTION

2.1 EXAMINATION

- A. Preinstallation Testing: Measure prevailing groundwater level.
- B. Verify survey benchmark elevations are as indicated on drawings.
- C. Verification of Conditions:
 - 1. Discharge area elevations and gradients.
- D. See Section 01 7123 - Field Engineering for additional requirements.

2.2 PREPARATION

- A. See Section 31 2316 for excavation.
- B. See Section 31 2316.13 for trenching.
- C. Excavation Safety: Comply with OSHA's Excavation Standard, 29 CFR 1926, Subpart P.
- D. Provide surface water diversion controls guiding storm water away from excavations.
- E. Protect from Dewatering Operations:
 - 1. Stormwater Control: Protect requirements, see Section 01 5713 - Temporary Erosion and Sediment Control.
 - 2. Survey Control: Protect monuments, benchmarks, and control points.
 - 3. Built Environment: Protect structures, utilities, roadways, and sidewalks.
 - 4. Landscaping and Hardscaping: Protect trees, plants, lawns, walks, walls, and fences.

2.3 INSTALLATION

- A. Prevent fine sands from entering system or discharge.
- B. Surface Water Control:
 - 1. Install dewatering system in accordance with shop drawings to control surface water.
 - 2. Prevent damages or disturbance to work from dewatering system.
- C. Groundwater Control:

1. Install dewatering system in accordance with engineering drawings to maintain groundwater levels below excavations.
 2. Do not install system components within excavations.
- D. Provide dewatering system standby equipment.

2.4 OPERATION

- A. Operate system continuously or as directed by Architect/Engineer.
- B. Maintain excavations free of water until underground utilities are constructed.
- C. Prevent damages or disturbances to work areas from discharge water.
- D. Maintain piezometric water level below excavation surface 24 inches, minimum.
- E. Maintain standby equipment in operating order.

2.5 WATER DISPOSAL

- A. Dispose of discharge water and collected sediment as directed by Architect/Engineer.
1. Prevent damages or disturbances to survey controls, built environment, or landscaping and hardscaping.
- B. Maintain water disposal system in operating order.
1. Clear debris and obstructions preventing water from entering disposal system.
- C. Prevent damages or disturbances to work areas from water disposal.

2.6 FIELD QUALITY CONTROL

- A. See Section 01 4000 - Quality Requirements for additional requirements.
- B. Resurvey existing adjacent structure and exterior improvement benchmarks. Notify Architect/Engineer of changes in elevations, positions, or slopes.
- C. Provide visual inspection access of loadbearing excavated surfaces by Architect/Engineer before proceeding with work.
- D. Observation Wells: Install and maintain wells during dewatering operations.
1. Quantity and Location: According to Architect or discharge permit.
 2. Water Depth Measurement Frequency: According to Architect or discharge permit.

2.7 CLOSEOUT ACTIVITIES

- A. See Section 01 7800 - Closeout Submittals for additional submittals.
- B. Dewatering System Removal: Remove upon completion of dewatering activities.
1. Equipment: Remove main and standby components.
 2. Wells: Remove casings and cap 36 inches, minimum below surface. Fill holes with sand and smooth surface.
 3. Temporary Controls: Restore to previous conditions, remove controls, fill excavations, and smooth berms according to Architect/Engineer.

2.8 PROTECTION

- A. Protect installed dewatering system from subsequent construction operations.

- B. Promptly repair dewatering system damages restoring operation.

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END OF SECTION 31 2319

SECTION 31 2323
FILL

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Filling, backfilling, and compacting for footings, slabs-on-grade, paving, site structures, and utilities.
- B. Backfilling and compacting for utilities.
- C. Filling holes, pits, and excavations generated as a result of removal (demolition) operations.
- D. Lightweight concrete fill.

1.2 RELATED REQUIREMENTS

- A. Section 01 5713 - Temporary Erosion and Sediment Control: Slope protection and erosion control.
- B. Section 31 0519 - Geosynthetics for Earthwork.
- C. Section 31 1000 - Site Clearing.
- D. Section 31 2200 - Grading: Site grading.
- E. Section 31 2316 - Excavation: Removal and handling of soil to be re-used.
- F. Section 31 2316.13 - Trenching: Excavating for utility trenches to utility main connections.
- G. Section 31 2316.26 - Rock Removal: Removal of rock during excavating.
- H. Section 31 3700 - Riprap.
- I. Section 32 9119 - Landscape Grading.

1.3 DEFINITIONS

- A. Finish Grade Elevations: Indicated on drawings.
- B. Subgrade Elevations: Indicated on drawings.
- C. Subgrade Elevations: 4 inches below finish grade elevations indicated on drawings, unless otherwise indicated.
- D. Finish Grade Elevations: 4 inches above subgrade elevations indicated on drawings, unless otherwise indicated.

1.4 REFERENCE STANDARDS

- A. AASHTO M 147 - Standard Specification for Materials for Aggregate and Soil-Aggregate Subbase, Base, and Surface Courses; 2017 (Reapproved 2021).
- B. AASHTO T 180 - Standard Method of Test for Moisture-Density Relations of Soils Using a 4.54-kg (10-lb) Rammer and a 457-mm (18-in.) Drop; 2022, with Errata.
- C. ASTM C136/C136M - Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates; 2019.

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- D. ASTM C150/C150M - Standard Specification for Portland Cement; 2022.
- E. ASTM C1602/C1602M - Standard Specification for Mixing Water Used in the Production of Hydraulic Cement Concrete; 2022.
- F. ASTM C796/C796M - Standard Test Method for Foaming Agents for Use in Producing Cellular Concrete Using Preformed Foam; 2019.
- G. ASTM D698 - Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft³ (600 kN-m/m³)); 2012 (Reapproved 2021).
- H. ASTM D1556/D1556M - Standard Test Method for Density and Unit Weight of Soil in Place by Sand-Cone Method; 2015, with Editorial Revision (2016).
- I. ASTM D1557 - Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft³ (2,700 kN-m/m³)); 2012 (Reapproved 2021).
- J. ASTM D1603 - Standard Test Method for Carbon Black Content in Olefin Plastics; 2020.
- K. ASTM D2167 - Standard Test Method for Density and Unit Weight of Soil in Place by the Rubber Balloon Method; 2015.
- L. ASTM D2487 - Standard Practice for Classification of Soils for Engineering Purposes (Unified Soil Classification System); 2017, with Editorial Revision (2020).
- M. ASTM D4318 - Standard Test Methods for Liquid Limit, Plastic Limit, and Plasticity Index of Soils; 2017, with Editorial Revision (2018).
- N. ASTM D4355/D4355M - Standard Test Method for Deterioration of Geotextiles by Exposure to Light, Moisture, and Heat in a Xenon Arc-Type Apparatus; 2021.
- O. ASTM D6637/D6637M - Standard Test Method for Determining Tensile Properties of Geogrids by the Single or Multi-Rib Tensile Method; 2015.
- P. ASTM D6817/D6817M - Standard Specification for Rigid Cellular Polystyrene Geofoam; 2017 (Reapproved 2021).
- Q. ASTM D6938 - Standard Test Methods for In-Place Density and Water Content of Soil and Soil-Aggregate by Nuclear Methods (Shallow Depth); 2023.
- R. ASTM D7557/D7557M - Standard Practice for Sampling of Expanded Polystyrene Geofoam Specimens; 2009 (Reapproved 2021).
- S. ICC-ES AC239 - Acceptance Criteria for Termite-Resistant Foam Plastic; 2008, with Editorial Revision (2022).

1.5 SUBMITTALS

- A. See Section 01 3300 - Submittal Procedures, for submittal procedures.
 - B. Soil Samples: 10 pounds sample of each type of fill; submit in air-tight containers to testing laboratory.
 - C. Materials Sources: Submit name of imported materials source.
 - D. Fill Composition Test Reports: Results of laboratory tests on proposed and actual materials used, including manufactured fill.
 - E. Compaction Density Test Reports.
-

- F. Lightweight Concrete Test Reports.
- G. Manufacturer's Instructions.
- H. Designer's Qualification Statement.
- I. Manufacturer's Qualification Statement.
- J. Lightweight Concrete Fill Installer's Qualification Statement.
- K. Testing Agency Qualification Statement.
- L. Specimen Warranty.

1.6 QUALITY ASSURANCE

- A. Designer Qualifications: Perform design of structural fill under direct supervision of a Professional Engineer experienced in design of this type of work and licensed in the State in which the Project is located.
- B. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section, with not less than ten years of documented experience.
- C. Lightweight Concrete Fill Applicator Qualifications: Company specializing in performing work of the type specified and with at least 13,000 cubic yards in five years of documented experience and approved by manufacturer.
- D. Testing Agency Qualifications: Independent firm specializing in performing testing and inspections of the type specified in this section.
- E. Copies of Documents at Project Site: Maintain at the project site a copy of each referenced document that prescribes execution requirements.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. When necessary, store materials on site in advance of need.
- B. When fill materials need to be stored on site, locate stockpiles where indicated.
 - 1. Separate differing materials with dividers or stockpile separately to prevent intermixing.
 - 2. Prevent contamination.
 - 3. Protect stockpiles from erosion and deterioration of materials.

1.8 WARRANTY

- A. See Section 01 7800 - Closeout Submittals, for additional warranty requirements.
- B. Correct defective Work within a five-year period after Date of Substantial Completion.
- C. Provide ten-year manufacturer warranty for manufactured fill material.

PART 2 PRODUCTS

2.1 FILL MATERIALS

- A. General Fill: Subsoil excavated on-site.
 - 1. Graded.
 - 2. Free of lumps larger than 3 inches, rocks larger than 2 inches, and debris.
 - 3. Complying with ASTM D2487 Group Symbol CL.

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- B. Structural Fill: Subsoil excavated on-site.
 - 1. Graded.
 - 2. Free of lumps larger than 3 inches, rocks larger than 2 inches, and debris.
 - 3. Complying with ASTM D2487 Group Symbol CL.
- C. Concrete for Fill: See Section 03 3000; compressive strength of 2,500 psi.
- D. Granular Fill - Gravel : Pit run washed stone; free of shale, clay, friable material and debris.
 - 1. Graded in accordance with ASTM D2487 Group Symbol GW.
- E. Granular Fill - Pea Gravel: Natural stone; washed, free of clay, shale, organic matter.
 - 1. Grade in accordance with ASTM D2487 Group Symbol GM.
- F. Sand: Natural river or bank sand; free of silt, clay, loam, friable or soluble materials, and organic matter.
 - 1. Grade in accordance with ASTM D2487 Group Symbol SW.
- G. Topsoil: See Section 32 9119.
- H. Engineered Fill - Lightweight Concrete:
 - 1. Finished Properties, Class II Engineered Fill:
 - a. Cast Density, Maximum: 30 pounds per cubic foot.
 - b. Compressive Strength, Minimum: 41 pounds per square inch.
 - 2. Materials:
 - a. Cement: ASTM C150/C150M.
 - b. Water: ASTM C1602/C1602M; clean, potable, and not detrimental to concrete.
 - c. Admixtures: As recommended by lightweight concrete fill manufacturer.
 - d. Expansion Material: Manufacturer's recommended expansion material.
 - e. Mix Design: By manufacturer.

2.2 ACCESSORIES

- A. Geotextile: See Section 31 0519.
- B. Vapor Retarder: 10 mil thick, polyethylene.
- C. Geosynthetic Erosion Control: Plastic rings overlaid on grids, interlocking, nonwoven geotextile bottom.
 - 1. Ring Thickness: 1 inch, minimum.
 - 2. Grid Opening: 3 inches (76.2 mm), maximum.
 - 3. Recycled Content: 100 percent.
 - 4. Material: High density polyethylene, minimum 1-1/2 percent carbon black, when tested in accordance with ASTM D1603.
 - 5. Tensile Strength at 2 percent Strain: 400 lb/ft (5.8 kN/m), minimum when tested in accordance with ASTM D6637/D6637M.
 - 6. Ultraviolet Stability: 65 percent, minimum, when tested in accordance with ASTM D4355/D4355M.

2.3 SOURCE QUALITY CONTROL

- A. See Section 01 4000 - Quality Requirements, for general requirements for testing and analysis of soil material.
- B. Where fill materials are specified by reference to a specific standard, test and analyze samples for compliance before delivery to site.
- C. If tests indicate materials do not meet specified requirements, change material and retest.
- D. Provide materials of each type from same source throughout the Work.

- E. Manufactured Fill - Geofoam:
 - 1. Initial Testing: Provide third-party testing indicating compliance with ASTM D6817/D6817M prior to first shipment of material to site. Compliance documentation for other rigid foam plastic reference standards is not acceptable.
 - 2. Ongoing Testing: Provide third-party testing indicating compliance with ASTM D6817/D6817M. Test at intervals that comply with ASTM D7557/D7557M.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify that survey benchmarks and intended elevations for the Work are as indicated.
- B. Identify required lines, levels, contours, and datum locations.
- C. See Section 31 2200 for additional requirements.
- D. Verify areas to be filled are not compromised with surface or ground water.

3.2 PREPARATION

- A. Scarify and proof roll subgrade surface to a depth of 6 inches to identify soft spots.
- B. Cut out soft areas of subgrade not capable of compaction in place. Backfill with general fill.
- C. Compact subgrade to density equal to or greater than requirements for subsequent fill material.
- D. Until ready to fill, maintain excavations and prevent loose soil from falling into excavation.

3.3 FILLING

- A. Fill to contours and elevations indicated using unfrozen materials.
- B. Fill up to subgrade elevations unless otherwise indicated.
- C. Employ a placement method that does not disturb or damage other work.
- D. Systematically fill to allow maximum time for natural settlement. Do not fill over porous, wet, frozen or spongy subgrade surfaces.
- E. Maintain optimum moisture content of fill materials to attain required compaction density.
- F. Granular Fill: Place and compact materials in equal continuous layers not exceeding 6 inches compacted depth.
- G. Soil Fill: Place and compact material in equal continuous layers not exceeding 8 inches compacted depth.
- H. Slope grade away from building minimum 2 inches in 10 feet, unless noted otherwise. Make gradual grade changes. Blend slope into level areas.
- I. Correct areas that are over-excavated.
 - 1. Load-bearing foundation surfaces: Use structural fill, flush to required elevation, compacted to 100 percent of maximum dry density.
 - 2. Other areas: Use general fill, flush to required elevation, compacted to minimum 97 percent of maximum dry density.
- J. Compaction Density Unless Otherwise Specified or Indicated:

1. Under paving, slabs-on-grade, and similar construction: 97 percent of maximum dry density.
2. At other locations: 95 percent of maximum dry density.

- K. Reshape and re-compact fills subjected to vehicular traffic.
- L. Maintain temporary means and methods, as required, to remove all water while fill is being placed as required, or until directed by the Architect/Engineer. Remove and replace soils deemed unsuitable by classification and which are excessively moist due to lack of dewatering or surface water control.

3.4 ENGINEERED FILL - LIGHTWEIGHT CONCRETE

- A. Install lightweight concrete fill according to manufacturer's written instructions.
- B. Use batching, mixing, and placing equipment approved by the manufacturer.
- C. Prevent segregation of material.
- D. Tolerance: Finished surface within 2 inches of elevation indicated on drawings.

3.5 FILL AT SPECIFIC LOCATIONS

- A. Use general fill unless otherwise specified or indicated.
- B. Under Interior Slabs-On-Grade:
1. Use granular fill.
 2. Depth: 4 inches deep.
 3. Compact to 95 percent of maximum dry density.
 4. Cover with sand.
 - a. Depth: 2 inches.
 - b. Compact to 95 percent of maximum dry density.
- C. Over Buried Utility Piping, Conduits, and Duct Bank in Trenches:
1. Bedding: Use general fill.
 2. Cover with general fill.
 3. Fill up to subgrade elevation.
 4. Compact in maximum 8 inch lifts to 95 percent of maximum dry density.
- D. At Lawn Areas:
1. Use general fill.
 2. Fill up to 6 inches below finish grade elevations.
 3. Fill up to subgrade elevations.
 4. Compact to 95 percent of maximum dry density.
 5. See Section 32 9119 for topsoil placement.
- E. At Planting Areas Other Than Lawns :
1. Use general fill.
 2. Fill up to 12 inches below finish grade elevations.
 3. Fill up to subgrade elevations.
 4. Compact to 95 percent of maximum dry density.
 5. See Section 32 9119 for topsoil placement.
- F. Under Pavers Set on Sand Leveling Bed:
1. Use granular fill.
 2. Fill up to bottom of sand leveling bed.
 3. Compact to 95 percent of maximum dry density.
 4. See unit pavers section for leveling bed placement.

- G. Under Monolithic Paving and Monolithic Paver Setting Beds:
 - 1. Compact subsoil to 95 percent of its maximum dry density before placing fill.
 - 2. Use general fill.
 - 3. Fill up to depth below finish paving elevation based on manufacturer guidelines.
 - 4. Fill up to subgrade elevation.
 - 5. Compact to 95 percent of maximum dry density.
 - 6. See Section 32 1120 for aggregate base course placed over fill.

3.6 TOLERANCES

- A. Top Surface of General Filling: Plus or minus 1 inch from required elevations.
- B. Top Surface of Filling Under Paved Areas: Plus or minus 1 inch from required elevations.

3.7 FIELD QUALITY CONTROL

- A. See Section 01 4000 - Quality Requirements, for general requirements for field inspection and testing.
- B. Soil Fill Materials:
 - 1. Perform compaction density testing on compacted fill in accordance with ASTM D1556, ASTM D2167, or ASTM D6938.
 - 2. Evaluate results in relation to compaction curve determined by testing uncompacted material in accordance with ASTM D698 ("standard Proctor"), ASTM D1557 ("modified Proctor"), or AASHTO T 180.
 - 3. If tests indicate work does not meet specified requirements, remove work, replace and retest.
 - 4. Frequency of Tests: Once per every lift of fill.
 - 5. Proof roll compacted fill at surfaces that will be under slabs-on-grade.
- C. Engineered Fill - Lightweight Concrete:
 - 1. Sampling: During initial placement, take four 3 inch by 6 inch 3 inch by 6 inch test specimens per 303 cubic yards of material placed or for each four hours of placement work.
 - 2. Testing: Provide third-party testing of samples in accordance with ASTM C796/C796M except do not oven-dry load-test specimens.

3.8 CLEANING

- A. See Section 01 7419 - Construction Waste Management and Disposal, for additional requirements.
- B. Remove unused stockpiled materials, leave area in a clean and neat condition. Grade stockpile area to prevent standing surface water.
- C. Leave borrow areas in a clean and neat condition. Grade to prevent standing surface water.

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END OF SECTION 31 2323

SECTION 31 2500
EROSION AND SEDIMENTATION CONTROLS

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Permanent erosion and sediment control.

1.2 RELATED REQUIREMENTS

- A. Section 31 0519 - Geosynthetics for Earthwork: Geotextiles, geogrids, fabrics, reinforcement mats, and other synthetic materials for erosion control.
- B. Section 31 2323 - Fill: Filling and compaction.
- C. Section 31 3700 - Riprap: Stabilization using riprap.
- D. Section 32 0190 - Operation and Maintenance of Planting: Post-occupancy maintenance.
- E. Section 32 9219 - Seeding: Permanent turf for erosion control.
- F. Section 32 9223 - Sodding: Permanent turf for erosion control.
- G. Section 32 9300 - Plants: Permanent plantings for erosion control.

1.3 REFERENCE STANDARDS

- A. AASHTO M 147 - Standard Specification for Materials for Aggregate and Soil-Aggregate Subbase, Base, and Surface Courses; 2017 (Reapproved 2021).
- B. ASTM D4318 - Standard Test Methods for Liquid Limit, Plastic Limit, and Plasticity Index of Soils; 2017, with Editorial Revision (2018).
- C. ASTM D5338 - Standard Test Method for Determining Aerobic Biodegradation of Plastic Materials Under Controlled Composting Conditions, Incorporating Thermophilic Temperatures; 2015 (Reapproved 2021).
- D. ASTM D7322/D7322M - Standard Test Method for Determination of Erosion Control Product (ECP) Ability to Encourage Seed Germination and Plant Growth Under Bench-Scale Conditions; 2017.
- E. ASTM D7367 - Standard Test Method for Determining Water Holding Capacity of Fiber Mulches for Hydraulic Planting; 2019, with Editorial Revision.
- F. ASTM D8298/D8298M - Standard Test Method for Determination of Erosion Control Products (ECP) Performance in Protecting Slopes from Continuous Rainfall-Induced Erosion Using a Tilted Bed Slope; 2020.
- G. EPA (NPDES) - National Pollutant Discharge Elimination System (NPDES), Construction General Permit; Current Edition.
- H. FHWA FLP-94-005 - Best Management Practices for Erosion and Sediment Control; 1995.
- I. USDA TR-55 - Urban Hydrology for Small Watersheds; USDA Natural Resources Conservation Service; 2015.

1.4 SUBMITTALS

- A. See Section 01 3300 - Submittal Procedures, for submittal procedures.
- B. Inspection Reports: Submit report of each inspection; identify each preventive measure, indicate condition, and specify maintenance or repair required and accomplished.
- C. Maintenance Instructions: Provide instructions covering inspection and maintenance for preventive measures that must remain after Substantial Completion.

PART 2 PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Comply with requirements of EPA (NPDES) for erosion and sedimentation control, as specified by the NPDES, for Phases I and II, and in compliance with requirements of Construction General Permit (CGP), whether the project is required by law to comply or not.
- B. Runoff Calculation Standard for Urban Areas: USDA TR-55.

2.2 MATERIALS

2.3 ACCESSORY MATERIALS

- A. Fill Material: See Section 31 2323.
- B. Geotextiles: See Section 31 0519.
- C. Mulching Material: See Section 32 9219.
- D. Grass Seed for Permanent Cover: See Section 32 9219.
- E. Sod for Permanent Cover: See Section 32 9223.
- F. Plants for Permanent Cover: See Section 32 9300.
- G. Riprap: See Section 31 3700.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Examine site and identify existing features that contribute to erosion resistance; maintain such existing features to greatest extent possible.

3.2 PREPARATION

- A. Schedule work so that soil surfaces are left exposed for the minimum amount of time.
- B. Do not begin clearing, grading, or other work involving disturbance of ground surface cover until applicable permits have been obtained; furnish documentation required to obtain applicable permits.
 - 1. Owner will withhold payment to Contractor equivalent to all fines resulting from non-compliance with applicable regulations.
- C. Timing: Put preventive measures in place as soon as possible after disturbance of surface cover and before precipitation occurs.

3.3 FIELD QUALITY CONTROL

- A. Provide analysis of topsoil fill; see Section 01 4000.
- B. Analyze to ascertain percentage of nitrogen, phosphorus, potash, soluble salt content, organic matter content, and pH value.
- C. Submit minimum 10 oz sample of proposed topsoil. Forward sample to approved testing laboratory in sealed containers to prevent contamination.
- D. Testing is not required if recent tests are available for imported topsoil. Submit these test results to the testing laboratory for approval. Indicate, by test results, information necessary to determine suitability.

3.4 INSTALLATION

- A. Hydroseeding: Apply seeded slurry with a hydraulic seeder at a rate of 2000 lbs per acre evenly in two intersecting directions.
 - 1. Soil Amendment: Provide soil amendments for application with hydroseeding slurry at manufacturer's recommended rates based on soil test results.
- B. Do not seed areas in excess of that which can be mulched on same day.
- C. Immediately following seeding, apply mulch to a thickness of 1/8 inch. Maintain clear of shrubs and trees.
- D. Apply water with a fine spray immediately after each area has been mulched. Saturate to 4 inches of soil.
- E. Following germination, immediately reseed areas without germinated seeds that are larger than 4 by 4 inches.

3.5 PROTECTION

- A. Identify seeded areas with stakes and string around area periphery.
- B. Cover seeded slopes where grade is 4 inches per foot or greater with geotextile fabric. Roll fabric onto slopes without stretching or pulling.
- C. Lay fabric smoothly on surface, bury top end of each section in 6-inch deep excavated topsoil trench. Provide 12-inch overlap of adjacent rolls. Backfill trench and rake smooth, level with adjacent soil.
- D. Secure outside edges and overlaps at 36-inch intervals with stakes.
- E. Lightly dress slopes with topsoil to ensure close contact between fabric and soil.
- F. At sides of ditches, lay fabric laps in direction of water flow. Lap ends and edges minimum 6 inches.

3.6 MAINTENANCE

- A. See Section 32 0190 for post-occupancy maintenance.
- B. Provide maintenance of seeded areas for three months from Date of Substantial Completion.
- C. Maintain seeded areas immediately after placement until grass is well established and exhibits a vigorous growing condition.
- D. Control growth of weeds. Apply herbicides in accordance with manufacturer's instructions. Remedy damage resulting from improper use of herbicides.

- E. Immediately reseed areas that show bare spots.
- F. Inspect preventive measures weekly, within 24 hours after the end of any storm that produces 0.5 inches or more rainfall at the project site, and daily during prolonged rainfall.
- G. Repair deficiencies immediately.
- H. Place sediment in appropriate locations on site; do not remove from site.
- I. Protect seeded areas with warning signs during maintenance period.

3.7 CLEAN UP

- A. Clean out sediment control structures that are to remain as permanent measures.

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END OF SECTION 31 2500

**SECTION 31 3700
RIPRAP**

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Riprap in sacks.

1.2 RELATED REQUIREMENTS

- A. Section 31 0519 - Geosynthetics for Earthwork.
- B. Section 31 2323 - Fill: Aggregate requirements.

1.3 QUALITY ASSURANCE

- A. Perform Work in accordance with State of Tennessee Highways standard.
- B. Maintain one copy of each document on site.

PART 2 PRODUCTS

2.1 MATERIALS

- A. Riprap: Broken stone, 6 inch minimum size, 12 inch maximum size; solid and nonfriable.
- B. Aggregate: Granular fill, see Section 31 2323.
- C. Bags: Woven jute.
- D. Binder: Portland cement.
- E. Geotextile: Non-biodegradable, woven.
- F. Geotextile: See Section 31 0519.

2.2 BAGGED RIPRAP

- A. Mix riprap, cement, sand and aggregate dry. Limit quantity of cement to 10 percent of dry mixed materials by volume.
- B. Fill bags with dry ingredients to 70 percent capacity and close by sewing or stapling to a straight seam.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Do not place riprap bags over frozen or spongy subgrade surfaces.

3.2 PLACEMENT

- A. Place geotextile over substrate, lap edges and ends.
- B. Place riprap at culvert pipe ends, embankment slopes, and as indicated.

- C. Place bags into position. Knead, ram, or pack filled bags to fit with the contour of adjacent material and other bags previously placed.
- D. Place bags in a staggered pattern. Remove foreign matter from bag surfaces.
- E. Installed Thickness: 5 inch average.
- F. Place rock evenly and carefully over bagged riprap to minimize voids, do not tear bag fabric, place bags and rock in one consistent operation to preclude disturbance or displacement of substrate.
- G. After placement, spray with water to moisten the bagged mix. Maintain moist for 24 hours.

3.3 SCHEDULES

- A. Culvert Pipe Ends: Bagged, placed one layer thick, 6 inch average thickness, concealed with topsoil fill.
- B. Sloped Grade At Retaining Wall: Individual riprap units, 6 inch thickness; placed prior to finish topsoil.

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END OF SECTION 31 3700

**SECTION 32 0190
OPERATION AND MAINTENANCE OF PLANTING**

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Maintain plants in manner that promotes health, growth, color and appearance, to quality levels specified; replace dead, dying, and damaged plants at no extra cost to Owner.
 - 1. It is Contractor's responsibility to determine type and quantity of soil amendments and fertilizer required.
 - 2. Perform soil analysis to determine type and quantity of soil amendments; test enough soil samples to obtain a comprehensive analysis; submit reports.
- B. Maintain newly planted landscape plants, including turf (lawns), trees, shrubs, ground cover, perennials, flowering bulbs, and annuals.
- C. Clean up landscaped areas.
- D. Maintenance Period: The time frame covered by these requirements is 90 days:
 - 1. Start Date: Project Date of Substantial Completion.

1.2 RELATED REQUIREMENTS

- A. Section 01 5713 - Temporary Erosion and Sediment Control.
- B. Section 31 2200 - Grading.
- C. Section 32 9119 - Landscape Grading.
- D. Section 32 9219 - Seeding.
- E. Section 32 9223 - Sodding.
- F. Section 32 9300 - Plants.

1.3 REFERENCE STANDARDS

- A. ANSI A300 Part 1 - American National Standard for Tree Care Operations - Tree, Shrub, and Other Woody Plant Management - Standard Practices (Pruning); 2017.
- B. ANSI Z133.1 - American National Standard for Arboricultural Operations - Safety Requirements; 2017.
- C. ASTM C602 - Standard Specification for Agricultural Liming Materials; 2023.
- D. ASTM D4972 - Standard Test Methods for pH of Soils; 2019.
- E. ASTM D5883 - Standard Guide for Use of Rotary Kiln Produced Expanded Shale, Clay or Slate (ESCS) as a Mineral Amendment in Topsoil Used for Landscaping and Related Purposes; 2018.

1.4 PROPOSAL SUBMITTALS

- A. Submit complete maintenance plan, showing:
 - 1. Irrigation volume and frequency.
 - 2. Fertilizer type, quantity, and schedule of application.
 - 3. Soil amendment type, quantity, and schedule of application.
 - 4. Personnel assigned, including supervisor.

5. Inspection procedures, diagnostics, and remedies.

1.5 SUBMITTALS

- A. See Section 01 3300 - Submittal Procedures, for submittal procedures.
- B. Soil Tests and Analysis: Submit report showing number of samples, test results, and recommendations for soil amendments and fertilizer.
- C. Product Data: Manufacturer's data sheets on each fertilizer, herbicide, pesticide, and other chemical material to be used, showing trade name, chemical composition, mixing instructions, recommended application rate, storage and handling instructions, and application instructions.
 1. Pesticides and Herbicides: Also include U.S. EPA registration number and Material Safety Data Sheets.
- D. Shop Drawings:
 1. Maintenance plan.
 2. Recommendations of the local Cooperative Extension Service office for maintenance and care of turf and other plants.
 3. Pesticide application plan; obtain approval of Owner for each individual pesticide application.
- E. Certificates: Certification of composition of the following as delivered:
 1. Fertilizer.
 2. Mulch.
 3. Pesticides.
 4. Herbicides.
 5. Other chemical materials.
- F. Installer Qualifications: As specified.
- G. Site Reports: Include date, time, personnel, condition of plants, activities, temperature, precipitation, irrigation applied; record:
 1. Each visit for maintenance purposes.
 2. Volume of water applied and area applied to.
 3. Diagnosis for treatment of unhealthy plants.
 4. Pesticide application; provide all additional reports and recordkeeping required by law.
 5. Herbicide application; provide all additional reports and recordkeeping required by law.
 6. Removal of dead plants, with quantity and diagnosis.
 7. Replanting.
 8. Volume of bio-degradable debris composted.
 9. Volume of wood chips produced.
 10. Volume of debris removed from site.

1.6 QUALITY ASSURANCE

- A. Installer Qualifications:
 1. Maintenance Contractor: The contractual entity that performed the planting installation.
 2. Pruners: Certified member, or supervised by certified member, of International Society of Arboriculture.
 3. Pesticide Applicators: Certified by authorities having jurisdiction.
 4. Herbicide Applicators: Certified by authorities having jurisdiction.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Deliver U.S. EPA-controlled materials to site in original containers with legible labels indicating registration number and registered uses.

**MAYFIELD REGIONAL DETENTION
REGIONAL PARK DREDGING AND STABILIZATION
COOK DRIVE POND IMPROVEMENTS
ATHENS, TENNESSEE
Gresham Smith Project No.: 46762.02**

- B. Deliver fertilizer and manufactured soil amendments to site in original containers bearing manufacturer's chemical analysis, name, trade name or trademark, and indication of compliance with applicable state and federal laws and regulations; alternatively, bulk delivery with equivalent certificate is acceptable.
- C. Store fertilizer, soil amendments, and mulch in dry locations away from contaminants.
- D. Do not store pesticides, herbicides, or other chemical treatment materials in locations where they could damage seeds or plants.

PART 2 PRODUCTS (NOT USED)

2.1 FERTILIZERS AND SOIL AMENDMENTS

- A. Fertilizers: Free flowing granular organic type containing nitrogen, phosphorus, and potassium, plus trace minerals and micro-nutrients; controlled release type is preferred.
 - 1. Determine type and quantity based on soil analysis.
- B. Soil Amendments: Type and quantity as required to achieve specified results, based on soil analysis.
- C. pH Adjuster: ASTM C602 Class O limestone.
- D. Gypsum: Commercially packaged, free flowing, minimum 95 percent calcium sulfate by volume.
- E. Sand: Clean and free of materials harmful to plants; 95 percent by weight, minimum, passing No.10 sieve and 10 percent by weight, minimum, passing No.16 sieve.
- F. Calcined Clay: Granular particles produced from montmorillonite clay calcined to minimum temperature of 1200 degrees F.
 - 1. Gradation:
 - a. 90 percent, minimum, passing No.8 sieve.
 - b. 99 percent, minimum, retained on No.60 sieve.
 - c. 2 percent, maximum, passing No.100 sieve.
 - 2. Density: 40 pounds per cubic foot.
- G. Expanded Shale, Clay, or Slate: ASTM D5883, rotary kiln produced.
- H. Decomposed Wood Derivatives: Ground bark, sawdust, humus or other green wood waste material; free of stones, sticks, and fully composted or stabilized with nitrogen.
- I. Recycled Compost: Well decomposed, stable, weed free; derived from food, agricultural or industrial residuals, biosolids, yard trimmings, or source-separated or mixed solid waste; with no objectionable odors and not resembling the raw material from which it was made; no substances toxic to plants.
 - 1. Gradation: 100 percent passing 3/8 inch screen.
 - 2. Moisture Content: 35 to 55 percent by weight.
 - 3. pH: 5.5 to 8.9.
 - 4. Not more than 1 percent man-made matter and without plastic items more than 2 inches in length.
- J. Worm Castings: Commercially packaged, without worms or food source.
- K. Manure: Unbleached horse, chicken, or cattle manure, well-rotted, containing maximum 25 percent by volume of straw, sawdust, and other bedding materials and no chemicals or ingredients harmful to plants; heat treated to kill weed seeds.
- L. Bonemeal: Finely ground, steamed, with 2 to 4 percent nitrogen and 16 to 40 percent phosphoric acid.

2.2 APPLIED MATERIALS

- A. Antidesiccants: Sprayable, water insoluble film-forming material that produces a moisture retarding barrier not removable by rain or snow.
 - 1. Film-Forming Temperature: Temperature commonly encountered out of doors during planting season.
 - 2. Moisture Vapor Transmission: 0.2 pounds per 24 hours at 70 percent humidity, maximum.
- B. Plant Growth Regulators: Sprayable, foliar absorbed non-translocatable liquid; not for application via permanent irrigation system.
- C. Organic Mulch: Maintain general appearance of existing mulched areas; use one of the following types:
 - 1. Wood chips ranging in size from 1/2 inch to one inch.
 - 2. Ground or shredded bark.
 - 3. Shredded hardwood ranging in size from 1/2 inch to one inch.
 - 4. Bark peelings ranging in size from 1/2 inch to one inch.
 - 5. Pine straw.
 - 6. Marsh hay.
 - 7. Pine needles.
 - 8. Peanut, pecan, or cocoa bean shells.
 - 9. Recovered 100 percent paper-based materials ranging in size from 1/2 inch to one inch.
 - 10. Recovered 100 percent wood-based materials ranging in size from 1/2 inch to one inch.
- D. Pesticides: U.S. EPA registered.
- E. Herbicides for Use on Turf: U.S. EPA registered.
 - 1. Pre-Emergence Type: Do not use.
- F. Water: Suitable for irrigation; Owner's water supply may be used.

PART 3 EXECUTION

3.1 EXAMINATION

- A. If soil analysis has not already been performed, take sufficient samples to obtain a comprehensive analysis; perform analysis in accordance with ASTM D4972.

3.2 LANDSCAPE MAINTENANCE - GENERAL

- A. Obtain and follow the maintenance instructions provided by the installer of new plant materials.
- B. Protect existing vegetation, pavements, and facilities from damage due to maintenance activities; restore damaged items to original condition or replace, at no extra cost to Owner.
- C. General Cleanup: Remove debris from all landscape areas at least once a week and from turf areas before each mowing.
 - 1. Debris consists of trash, rubbish, dropped leaves, downed branches and limbs of all sizes, dead vegetation, rocks, and other material not belonging in landscaped areas.
 - 2. Remove debris from site and dispose of properly.
- D. Watering, Soil Erosion, and Sedimentation Control: Comply with federal, state, local, and other regulations in force; prevent over-watering, run-off, erosion, puddling, and ponding.
 - 1. Site grading and planting have been designed to resist erosion once fully grown, with temporary measures in place during establishment period.
 - 2. Repair temporary erosion control mechanisms provided by others.
 - 3. Repair eroded areas and replant, when caused by inadequate maintenance.
 - 4. Prevent sediment from entering storm drains.

**MAYFIELD REGIONAL DETENTION
REGIONAL PARK DREDGING AND STABILIZATION
COOK DRIVE POND IMPROVEMENTS
ATHENS, TENNESSEE
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- E. Trees: Exercise care to avoid girdling trees; provide protective collars if necessary; remove protective collars at end of maintenance period.
- F. Fertilizing: Apply fertilizer only when necessary.
- G. Earth Mound Watering Basins: Maintain in good condition and as required to permit efficient application of water without waste; reapply mulch if soil surface shows.
- H. Drainage Channels: Remove obstructions in gutters, catch basins, storm drain inlets, yard drains, swales, ditches, and overflows.
 - 1. Remove grates from catch basins to clean.
 - 2. Prevent encroachment of other vegetation on turfed surface drainage channels.
- I. Health Maintenance: Inspect all plants regularly for health:
 - 1. Eradicate diseases and damaging pests, regardless of severity or speed of effect.
 - 2. Treat accidental injuries and abrasions.
 - 3. If a plant is unhealthy but not yet dead, according to specified definitions, determine reason(s) and take remedial action immediately.
 - 4. Remove dead plants immediately upon determining that they are dead.
- J. Pesticide and Herbicide Application: Comply with manufacturer's instructions and recommendations and applicable regulations.
 - 1. Obtain Owner's approval prior to each application.
 - 2. Apply in manner to prevent injury to personnel and damage to property due to either direct spray or drifting, both on and off Owner's property.
 - 3. Use backflow preventers on hose bibbs used for mixing water; prevent spills.
 - 4. Inspect equipment daily before application; repair leaks, clogs, wear, and damage.
 - 5. Do not dispose of excess mixed material, unmixed material, containers, residue, rinse water, or contaminated articles on site; dispose of off site in legal manner.
 - 6. Rinse water may be used as mix water for next batch of same formulation.
 - 7. Contractor is responsible for all recordkeeping, submissions, and reports required by laws and regulations.
- K. Replanting: Perform replacement and replanting immediately upon removal of dead plant.

3.3 IRRIGATION

- A. Irrigation: Do not allow plants to wilt; apply water as required to supplement rainfall; do not waste water; do not water plants or areas not needing water; do not water during rainfall; shut off water flow when finished; repair leaks.
 - 1. No automatic irrigation system is available; provide hoses and other equipment as required.
 - 2. Owner's water source may be used.
 - 3. Do not drive water trucks over turf, seeded areas, or planting beds.
 - 4. Provide backflow preventers on hose bibbs used for irrigation hoses.

3.4 RENOVATION OF ESTABLISHED TURF

- A. Remove turf from around trees to radius of 18 inches from base of tree trunk. Cut turf out and remove; do not simply mow. Trim turf edge as specified.
- B. Trim perimeter of turf area and around intervening objects as specified under Turf Maintenance.
- C. Eliminate undesirable grasses and weeds. Remove as much thatch as possible.
- D. Aerate established turf by coring and pulling out soil plugs 2 to 3 inches deep and not more than 2 inches apart.
 - 1. Leave the plugs on the turf until the soil has been washed from them, then remove.

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2. Clean plugs from pavements immediately.
- E. Apply fertilizer over entire aerated area.
- F. After aeration, seed entire aerated area as specified in Section 32 9219, rake or brush seed into contact with soil.
- G. When soil amendments are necessary, apply as top dressing to entire aerated area after overseeding to depth of 1/4 inch; blend top dressing mixture thoroughly before applying.
- H. Water as soon as possible after planting. Do not allow newly planted material to become dry.
- I. Fertilize again 3 to 4 weeks after seeding.
- J. Begin normal mowing once grass reaches 1-1/2 times specified mowing height.

3.5 TURF MAINTENANCE

- A. Maintain turf in manner required to produce turf that is healthy, uniform in color and leaf texture, and free from weeds and other undesirable growth.
 1. Obtain and follow the recommendations of local agricultural extension service office.
 2. Grass Density - Lawns: 20 plants per square foot, minimum.
 3. Grass Density - Other Than Lawns: 10 plants per square foot, minimum.
 4. Bare Spots - Lawns: 2 percent of total area, maximum; 6 inches square, maximum.
 5. Bare Spots - Other Than Lawns: 2 percent of total area, maximum.
 6. Keep turf relatively free of thatch, woody plant roots, diseases, nematodes, soil-borne insects, stones larger than 1 inch in diameter, and other materials detrimental to grass growth.
 7. Limit broadleaf weeds and patches of foreign grass to a maximum of 2 percent of the total area.
 8. When new grass is planted in existing turf areas, quality will be evaluated when grass is 1 inch high.
- B. Mowing: During growing season(s) mow turf to uniform height, in manner that prevents scalping, rutting, bruising, and uneven or rough cutting.
 1. Prior to mowing clean all debris and leaves from turf surface.
 2. Schedule frequency of mowing so that no more than one-quarter to one-third of grass leaf length is removed during a cutting.
 - a. Maximum grass height before mowing: 4 inches.
 - b. Height of turf is measured from the soil surface.
 3. Make each successive mowing at approximately 45 degrees to the previous mowing, if practical.
 4. Cool Season Grasses:
 - a. Reduce mowing height in fall and spring.
 - b. Use rotary type mowers; mulcher type mowers may be used.
 5. Warm Season Grasses:
 - a. Increase mowing height slightly as fall approaches.
 - b. Use reel type mowers; do not use mulcher mowers.
 6. Removal of grass clippings is not required.
- C. Summer Mowing Height for Lawns:
 1. Bahiagrass: 3 inches.
 2. Bentgrass, Colonial and Creeping: 1 inches.
 3. Bermuda, Common: 2 inches.
 4. Bermuda, Hybrid: 1 inches.
 5. Bluegrass: 3 inches.
 6. Buffalo Grass: 4 inches.
 7. Carpetgrass: 2 inches.
 8. Centipede Grass: 2 inches.
 9. Fescue, Creeping Red: 3 inches.
 10. Fescue, Fine: 2 inches.

11. Fescue, Tall: 4 inches.
 12. Rye, Annual: 3 inches.
 13. Rye, Perennial: 3 inches.
 14. St. Augustine, Common: 4 inches.
 15. St. Augustine, Improved: 3 inches.
 16. Zoysia: 2 inches.
- D. Trimming: Immediately after each mowing, neatly trim perimeter of each turf area and around obstructions within turf area; match height and appearance of adjacent turf.
1. Adjacent to Pavements: Cut edges of turf to form a distinct, uniform turf edge.
 2. Adjacent to Planting Beds and Permanently Mulched Areas: Cut edges of turf to form a distinct, uniform turf edge.
 3. Around Palm Trees: Do not use string trimmer as it slowly damages the bark, leaving tree susceptible to disease.
 4. Around Other Trees and Poles: Where no planting bed or mulched area exists, trimming with string trimmer is acceptable.
 5. At Fences: Trim on both sides of fence.
 6. Irrigation Heads and Valve Boxes: Trim neatly so grass doesn't interfere with operation.
- E. Fertilizer: Apply as recommended by manufacturer and at rate indicated by soil analysis.
1. Cool Season Grasses: Apply at least once, in Fall before first frost; do not apply high nitrogen fertilizer during Summer; Spring application is optional but must be reduced in quantity.
 2. Warm Season Grasses: Make two applications, in Spring when grass begins to green up, and in Fall about 6 weeks before average first frost.
- F. Reseeding: Comply with requirements of Section 32 9219.
- G. Resodding: Comply with requirements of Section 32 9223.

3.6 PLANTING BED MAINTENANCE

- A. Planting beds include all planted areas except turf.
- B. Begin maintenance immediately after plants have been installed; inspect at least once a week and perform needed maintenance promptly.
- C. Keep planting beds free of pests; remove weeds and grass by hand before reaching 1 inch height.
- D. Do not allow climbing, twining, or creeping plants to encroach into other species.
- E. Ground Cover and Vines:
1. Trim to encourage dense, well-developed growth covering intended areas.
 2. Do not allow plants to grow up trees, shrubs, or vines or encroach into turf or drainage channels, unless the drainage channel is intended to be planted with ground cover.
 3. Remove existing plants grown up trees, shrubs, and vines.
- F. Flowering Plants: Remove dead flower heads; do not trim off leaves of flowering bulbs until they are brown.
- G. Replace mulch as required and remove debris.

3.7 TREE AND SHRUB MAINTENANCE

- A. Trees will be considered dead when main leader has died back or when 25 percent or more of crown has died; except as otherwise indicated for palm trees.
- B. Shrubs will be considered dead when 25 percent or more of plant has died.

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- C. Inspect woody plants for health by scraping up to 1/16 inch square area of bark; no green cambium layer below bark shall be evidence of death.
- D. Adjust stakes, guys and turnbuckles, ties, and trunk wrap as required to promote growth and avoid girdling.
- E. Fertilizing: Fertilize all trees at least once during maintenance period; use accepted standards for determining type and method of fertilization.
- F. Pruning: Unless otherwise indicated, prune only to maintain balanced natural shape; follow recommendations of ANSI A300 and ANSI Z133.1 and best local practices for species involved.
- G. Shrubs: Prune at least once during maintenance period at best time to influence ultimate shape and size for the particular species.
 - 1. Prune to balance the plant's form and according to its natural growth characteristics.
 - 2. Remove water shoots, suckers, and branches not complying with desired shape and size.
- H. Young Trees: Prune at least once during maintenance period at best time to influence ultimate shape and size for the particular species; do not remove or cut off leader.
- I. Renovation of Established Shrubs: Prune and trim as required to improve shape and balance as appropriate to the particular species; remove dead, damaged, and diseased branches and limbs; do not remove excess growth except as follows:
 - 1. Remove growth in front of windows, above or obstructing entranceways and walkways, leaning against structures, and obstructing vision at street intersections.
 - 2. Where indicated, remove excess growth by pruning technique best suited to future growth for the particular species.
- J. Renovation of Established Trees :
 - 1. Remove dead, damaged, and diseased branches and limbs and structurally weak limbs that may be a safety hazard.
 - 2. Remove growth in front of windows, above or obstructing entranceways and walkways, and leaning against structures.
 - 3. Remove growth obstructing traffic signs or vision at street intersections.
 - 4. Remove branches that extend over buildings or otherwise endanger roofs.
 - 5. Remove low-hanging branches over vehicular traffic routes to height necessary to clear expected traffic including buses and moving vans.
 - 6. Where indicated, remove excess growth by pruning technique best suited to future growth for the particular species.

3.8 CLEANING

- A. Remove fallen deciduous leaves in Fall; removal may wait until all leaves have fallen.
- B. Clean adjacent pavements of plant debris and other debris generated by maintenance activities.
- C. Remove and dispose of general cleanup debris and biodegradable debris in a proper manner; Owner's trash collection facilities may be used.
- D. Remove and dispose of general cleanup debris and biodegradable debris in a proper manner.
 - 1. Biodegradable Debris: Owner will designate a compost pile on site where biodegradable debris may be deposited; branches and bark are not considered biodegradable.
 - 2. Branches and Bark: Owner will designate a wood chip storage area; machine-chip all branch and bark debris.
 - 3. Non-Biodegradable Debris: Owner's trash collection facilities may be used.

3.9 CLOSEOUT ACTIVITIES

- A. 10 days prior to end of maintenance period, submit request for final inspection.
- B. Final inspection will be conducted by Owner.

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END OF SECTION 32 0190

**SECTION 32 1120
SUBBASE AND AGGREGATE BASE COURSES**

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Subbase course.
- B. Geosynthetic reinforcement.
- C. Aggregate base course.

1.2 RELATED REQUIREMENTS

- A. Section 31 0519 - Geosynthetics for Earthwork.
- B. Section 31 2200 - Grading.
- C. Section 31 2316.13 - Trenching.
- D. Section 31 2323 - Fill.
- E. Section 32 1623 - Sidewalks.

1.3 REFERENCE STANDARDS

- A. AASHTO M 147 - Standard Specification for Materials for Aggregate and Soil-Aggregate Subbase, Base, and Surface Courses; 2017 (Reapproved 2021).
- B. AASHTO T 180 - Standard Method of Test for Moisture-Density Relations of Soils Using a 4.54-kg (10-lb) Rammer and a 457-mm (18-in.) Drop; 2022, with Errata.
- C. ASTM C136/C136M - Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates; 2019.
- D. ASTM D698 - Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft³ (600 kN-m/m³)); 2012 (Reapproved 2021).
- E. ASTM D1241 - Standard Specification for Materials for Soil-Aggregate Subbase, Base, and Surface Courses; 2015.
- F. ASTM D1556/D1556M - Standard Test Method for Density and Unit Weight of Soil in Place by Sand-Cone Method; 2015, with Editorial Revision (2016).
- G. ASTM D1557 - Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft³ (2,700 kN-m/m³)); 2012 (Reapproved 2021).
- H. ASTM D2167 - Standard Test Method for Density and Unit Weight of Soil in Place by the Rubber Balloon Method; 2015.
- I. ASTM D2487 - Standard Practice for Classification of Soils for Engineering Purposes (Unified Soil Classification System); 2017, with Editorial Revision (2020).
- J. ASTM D3665 - Standard Practice for Random Sampling of Construction Materials; 2012 (Reapproved 2017).

- K. ASTM D4318 - Standard Test Methods for Liquid Limit, Plastic Limit, and Plasticity Index of Soils; 2017, with Editorial Revision (2018).
- L. ASTM D5397 - Standard Test Method for Evaluation of Stress Crack Resistance of Polyolefin Geomembranes Using Notched Constant Tensile Load Test; 2020.
- M. ASTM D6693/D6693M - Standard Test Method for Determining Tensile Properties of Nonreinforced Polyethylene and Nonreinforced Flexible Polypropylene Geomembranes; 2020.
- N. ASTM D6938 - Standard Test Methods for In-Place Density and Water Content of Soil and Soil-Aggregate by Nuclear Methods (Shallow Depth); 2023.

1.4 SUBMITTALS

- A. See Section 01 31 for submittal procedures.
- B. Product Data: Geogrid indicating tensile strength.
- C. Test Reports:
 - 1. Aggregate Composition: Results of laboratory tests on proposed and actual materials used.
 - 2. Compaction Density: Results of laboratory tests on compacted course.
- D. Manufacturer's Instructions: Indicate geosynthetic installation procedure.
- E. Source Quality Control Submittals: Submit name of imported materials source.
- F. Field Quality Control Submittals: Submit compaction density testing results.
- G. Testing agency's qualification statement.

1.5 QUALITY ASSURANCE

- A. Installer Qualifications: Company specializing in performing work of the type specified and with minimum three years of documented experience.
- B. Testing Agency Qualifications: Independent firm specializing in performing testing and inspections of type specified in this section.
- C. Documents at Project Site: Maintain at project site one copy of manufacturer's instructions.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. See Section 01 7419 - Construction Waste Management and Disposal for packaging waste requirements.
- B. Deliver geosynthetic to project site wrapped in protective covering, maintain prior to use.
- C. Aggregate Storage: Prevent material intermixing, contamination, and deterioration.

PART 2 PRODUCTS

2.1 MATERIALS

- A. Subbase Course:
 - 1. Comply with State of Tennessee Highway Department standard.
 - 2. Graded in accordance with ASTM D2487 Group Symbol SW.
- B. Geosynthetic:

1. Geotextile: See Section 31 0519.
- C. Aggregate Base Course:
 1. Comply with State of Tennessee Highway Department standard.

2.2 SOURCE QUALITY CONTROL

- A. See Section 01 4000 - Quality Requirements for additional requirements.
- B. If tests indicate materials do not meet specified requirements, change material and retest.
- C. Provide materials of each type from same source throughout the Work.
- D. For aggregate materials using classification complying with ASTM D2487, provide testing before delivery to site.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify that survey benchmarks and intended elevations for the work are as indicated.
- B. Verify substrate has been inspected, and gradients and elevations are correct and dry.

3.2 PREPARATION

- A. Correct irregularities in substrate gradient and elevation by scarifying, reshaping, and recompacting.
- B. Do not place aggregate on soft, muddy, or frozen surfaces.
- C. Grade excavated and filled substrate; see Section 31 2200.
- D. Backfill and compact trench excavations; see Section 31 2316.13.
- E. Backfill and compact subgrade fill; see Section 31 2323.

3.3 PLACEMENT

- A. Under Bituminous Concrete Paving:
 1. Subbase Compacted Thickness: According to design drawings.
 2. Install geosynthetic reinforcement on substrate in accordance with manufacturers instructions.
 3. Aggregate Base Compacted Thickness: According to design drawings.
- B. Under Portland Cement Concrete Paving:
 1. Subbase Compacted Thickness: According to design drawings.
 2. Install geosynthetic reinforcement on substrate in accordance with manufacturers instructions.
 3. Aggregate Base Compacted Thickness: According to design drawings.
- C. Place course in maximum 4 inch layers and roller compact to specified density.
- D. Level and contour surfaces to elevations and gradients indicated.
- E. Use mechanical tamping equipment in areas inaccessible to compaction equipment.

3.4 TOLERANCES

- A. Variation From Design Elevation: Within 1/2 inch.

- B. Flatness: Maximum variation of 1/2 inch measured with 10 foot straight edge.
- C. Scheduled Compacted Thickness: Within 1/2 inch.

3.5 FIELD QUALITY CONTROL

- A. See Section 01 4000 - Quality Requirements for additional requirements.
- B. Evaluate results in relation to compaction curve determined by testing uncompacted material in accordance with AASHTO T 180, ASTM D698 ("standard Proctor"), or ASTM D1557 ("modified Proctor").
- C. Frequency of Tests: In accordance with ASTM D3665.
- D. Remove, replace, and retest work that does not meet specified requirements.

3.6 CLEANING

- A. See Section 01 7000 - Execution and Closeout Requirements for additional requirements.
- B. Remove unused materials and grade areas to prevent standing surface water.

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END OF SECTION 32 1120

**SECTION 32 1623
SIDEWALKS**

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Concrete sidewalks.
- B. Concrete wheelchair ramps.

1.2 RELATED REQUIREMENTS

- A. Section 32 1120 - Subbase and Aggregate Base Courses.
- B. Section 32 1726 - Tactile Warning Surfacing.

1.3 REFERENCE STANDARDS

- A. ACI PRC-211.1 - Selecting Proportions for Normal-Density and High Density-Concrete - Guide; 2022.
- B. ACI PRC-305 - Guide to Hot Weather Concreting; 2020.
- C. ACI PRC-306 - Guide to Cold Weather Concreting; 2016.
- D. ADA Standards - 2010 ADA Standards for Accessible Design; 2010.
- E. ASTM A1064/A1064M - Standard Specification for Carbon-Steel Wire and Welded Wire Reinforcement, Plain and Deformed, for Concrete; 2022.
- F. ASTM C33/C33M - Standard Specification for Concrete Aggregates; 2023.
- G. ASTM C94/C94M - Standard Specification for Ready-Mixed Concrete; 2024.
- H. ASTM C144 - Standard Specification for Aggregate for Masonry Mortar; 2018.
- I. ASTM C157/C157M - Standard Test Method for Length Change of Hardened Hydraulic-Cement Mortar and Concrete; 2017.
- J. ASTM C309 - Standard Specification for Liquid Membrane-Forming Compounds for Curing Concrete; 2019.
- K. ASTM C902 - Standard Specification for Pedestrian and Light Traffic Paving Brick; 2022.
- L. ASTM C936/C936M - Standard Specification for Solid Concrete Interlocking Paving Units; 2023a.
- M. ASTM C1315 - Standard Specification for Liquid Membrane-Forming Compounds Having Special Properties for Curing and Sealing Concrete; 2019.
- N. ASTM C1116/C1116M - Standard Specification for Fiber-Reinforced Concrete; 2023.
- O. ASTM D1751 - Standard Specification for Preformed Expansion Joint Filler for Concrete Paving and Structural Construction (Nonextruding and Resilient Asphalt Types); 2023.
- P. ASTM D5084 - Standard Test Methods for Measurement of Hydraulic Conductivity of Saturated Porous Materials Using a Flexible Wall Permeameter; 2016a.
- Q. ASTM D5268 - Standard Specification for Topsoil Used for Landscaping and Construction Purposes; 2023.

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- R. ASTM D8139 - Standard Specification for Semi-Rigid, Closed-Cell Polypropylene Foam, Preformed Expansion Joint Fillers for Concrete Paving and Structural Construction; 2023.
- S. COE CRD-C 48 - Handbook for Concrete and Cement Standard Test Method for Water Permeability of Concrete; 1992.
- T. NSF 372 - Drinking Water System Components - Lead Content; 2024.
- U. NSF 61 - Drinking Water System Components - Health Effects; 2024.

1.4 SUBMITTALS

- A. See Section 01 3300 - Submittal Procedures, for submittal procedures.
- B. Product Data:
 - 1. Concrete: Provide data on admixtures.
- C. Design Data: Indicate pavement thickness, design strength, reinforcement, and typical details.
- D. Weather Data: Records during placement of asphalt or concrete, including date, location of placement, quantity, and air temperature.

1.5 FIELD CONDITIONS

- A. Follow recommendations of ACI PRC-305 and ACI PRC-306 when concreting during hot and cold weather, respectively.
- B. Follow recommendations of polymeric sand manufacturer.

PART 2 PRODUCTS

2.1 CONCRETE SIDEWALKS AND WHEELCHAIR RAMPS

- A. Gravel Subbase: 4 inch.
- B. Concrete Forms: Wood.
- C. Concrete Materials: Comply with ASTM C94/C94M.
- D. Aggregate: Pit Run, washed, 3/8 inch (1 cm) stone; free of shale, clay, friable material and debris.
- E. Waterproofing Admixture: Admixture formulated to reduce permeability to liquid water, with no adverse effect on concrete properties.
- F. Joint Filler: Preformed expansion, with a thickness of 1/2 inch.
- G. Curing Compound: Synthetic, Type 1, Class A, according to ASTM C309.
- H. Surface Sealer: Topical, Type 1, Class A, according to ASTM C1315.
- I. Tactile Warning Surfaces: See Design Drawings.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify gradients and elevations of the subgrade are correct as shown on drawings. Where poor subgrade material is encountered, remove and replace with suitable material.
- B. Verify compacted subgrade is acceptable, ready to support imposed loads and paving, and ready to receive work.

3.2 SUBBASE PREPARATION

- A. Maintain subgrade in a smooth, compacted condition with required section and established grade until concrete is placed.
- B. See Section 32 1120 for aggregate subbase.
- C. Apply primer on aggregate subbase at uniform rate of 1/3 gallon per square yard.

3.3 CONCRETE SIDEWALK AND WHEELCHAIR RAMP INSTALLATION

- A. Mixing:
 - 1. Proportioning Normal Weight Concrete: Comply with ACI PRC-211.1 recommendations.
 - 2. Admixtures: Add acceptable admixtures as recommended in ACI PRC-211.1 and at rates recommended by manufacturer.
- B. Forming:
 - 1. Assemble formwork to permit easy stripping and dismantling without damaging concrete.
 - 2. Sidewalk Forms: Place and secure forms to location, dimension, profile, and gradient shown on drawings. Height equal to the full depth of the finished sidewalk.
 - 3. Wheelchair Ramps: Place and secure forms to location, dimension, profile, and gradient shown on drawings. Comply with ADA Standards.
- C. Reinforcement:
 - 1. Place wire-mesh reinforcement mid-height of forms.
 - 2. Uniformly add fiber reinforcement to concrete mix according to manufacturer's recommendations.
- D. Placement:
 - 1. Place concrete in a single lift.
 - 2. Consolidate concrete by tamping and spading.
 - 3. Install work in accordance with City of Athens Public Works.
- E. Joints:
 - 1. Spacing: Provide scored joints every 10 feet (3 m).
 - 2. Provide keyed joints as indicated.
 - 3. Filler height equal to the full depth of the finished concrete.
- F. Finishing:
 - 1. Sidewalk Paving: Light broom, texture perpendicular to direction of travel with troweled and radiused edge, 1/4 inch radius.
 - 2. Wheelchair Ramps: Broomed perpendicular to slope.
 - 3. Place curing compound on exposed concrete surfaces immediately after finishing. Apply in accordance with manufacturer's instructions.
 - 4. Place surface sealer on exposed concrete surfaces after hardening. Apply in accordance with manufacturer's instructions.
- G. Record weather information for placement.

3.4 PROTECTION

- A. Immediately after placement, protect sidewalk from premature drying, excessively hot or cold temperatures, and mechanical injury.
- B. Do not permit pedestrian traffic over sidewalk for 7 days minimum after finishing.

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END OF SECTION 32 1623

**SECTION 32 9119
LANDSCAPE GRADING**

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Topsoil placement.
- B. Finish grading.

1.2 RELATED REQUIREMENTS

- A. Section 31 1000 - Site Clearing.
- B. Section 31 2200 - Grading.
- C. Section 31 2316 - Excavation.
- D. Section 31 2323 - Fill.
- E. Section 32 9219 - Seeding.
- F. Section 32 9223 - Sodding.

1.3 REFERENCE STANDARDS

- A. 29 CFR 1910.266 - Logging Operations; Current Edition.
- B. ASTM D2487 - Standard Practice for Classification of Soils for Engineering Purposes (Unified Soil Classification System); 2017, with Editorial Revision (2020).
- C. ASTM D5268 - Standard Specification for Topsoil Used for Landscaping and Construction Purposes; 2023.

1.4 SUBMITTALS

- A. Project Record Documents: Accurately record actual locations of utilities remaining by horizontal dimensions, elevations or inverts, and slope gradients.
- B. Field Quality Control Submittals: Topsoil depth measurements.

1.5 QUALITY ASSURANCE

- A. Perform work in accordance with City of Athens, Public Works Department standards.
 - 1. Maintain one copy on-site.

1.6 FIELD CONDITIONS

- A. Place topsoil during dry weather.
- B. Ambient Conditions: Terminate work during hazardous environmental conditions in accordance with 29 CFR 1910.266.
- C. Existing Conditions: See site drawing; see Section 00 3100 - Available Project Information.
- D. Traffic: Comply with other requirements specified in Section 01 5500 - Vehicular Access and Parking.

PART 2 PRODUCTS

2.1 MATERIALS

- A. Topsoil: Comply with ASTM D5268.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify grading and intended elevations are as indicated on drawings.
- B. Verify absence of standing or ponding water.

3.2 PREPARATION

- A. Protect site features to remain, including benchmarks, survey control points, existing structures, fences, sidewalks, paving, and curbs.
- B. Protect trees, plants, lawns, rock outcroppings, and other features to remain.
- C. Remove debris, roots, branches, stones, in excess of 1/2 inch in size.
- D. Scarify surface to depth of 3 inches.
- E. Clear site; see Section 31 1000.
- F. Grade substrate, see Section 31 2200.

3.3 TOPSOIL PLACEMENT

- A. Uniformly distribute and spread topsoil.
- B. Place topsoil in areas where seeding, sodding, and planting as indicated on drawings.
- C. Place topsoil to the following compacted thicknesses:
 - 1. Areas Indicated Seeded with Grass: 6 inches.
 - 2. Areas Indicated as Sodded: 4 inches.
 - 3. Shrub Beds: 18 inches.
 - 4. Flower Beds: 12 inches.

3.4 FINISH GRADING

- A. Maintain profiles and contour of subgrade.
- B. Remove roots, weeds, rocks, and foreign material while spreading.
- C. Maintain uniform topsoil thickness.
- D. Lightly compact placed topsoil.
- E. Maintain stability of topsoil during inclement weather. Replace eroded topsoil.
- F. Apply seed, see Section 32 9219.
- G. Apply sod; see Section 32 9223.

3.5 TOLERANCES

- A. Topsoil Thickness: 1/2 inch plus/minus.

3.6 CLEANING

- A. See Section 01 7000 - Execution and Closeout Requirements for additional requirements.
- B. Remove unused topsoil. Grade stockpile area to prevent standing water.

3.7 PROTECTION

- A. Protect from stormwater runoff and subsequent construction operations.
- B. Do not permit traffic until established.

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END OF SECTION 32 9119

**SECTION 32 9219
SEEDING**

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Preparation of subsoil.
- B. Placing topsoil.
- C. Hydroseeding, mulching and fertilizer.
- D. Soil pH neutralizer.

1.2 RELATED REQUIREMENTS

- A. Section 31 2200 - Grading: Preparation of subsoil topsoil in preparation for the work of this section.
- B. Section 32 0190 - Operation and Maintenance of Planting: Post-occupancy maintenance.
- C. Section 32 1500 - Aggregate Surfacing: Additional seeding requirements.
- D. Section 32 9119 - Landscape Grading: Topsoil placement and finish grading.

1.3 DEFINITIONS

- A. Weeds: Include Dandelion, Jimsonweed, Quackgrass, Horsetail, Morning Glory, Rush Grass, Mustard, Lambsquarter, Chickweed, Cress, Crabgrass, Canadian Thistle, Nutgrass, Poison Oak, Blackberry, Tansy Ragwort, Bermuda Grass, Johnson Grass, Poison Ivy, Nut Sedge, Nimble Will, Bindweed, Bent Grass, Wild Garlic, Perennial Sorrel, and Brome Grass.

1.4 SUBMITTALS

- A. See Section 01 3300 - Submittal Procedures, for submittal procedures.
- B. Topsoil samples.
- C. Certificate: Certify seed mixture approval by authority having jurisdiction.
- D. Maintenance Data: Include maintenance instructions, cutting method and maximum grass height; types, application frequency, and recommended coverage of fertilizer.
- E. Maintenance Contract.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Deliver grass seed mixture in sealed containers. Seed in damaged packaging is not acceptable. Deliver seed mixture in containers showing percentage of seed mix, year of production, net weight, date of packaging, and location of packaging.
- B. Deliver fertilizer in waterproof bags showing weight, chemical analysis, and name of manufacturer.

PART 2 PRODUCTS

2.1 REGULATORY REQUIREMENTS

- A. Comply with regulatory agencies for fertilizer and herbicide composition.
- B. Provide certificate of compliance from authority having jurisdiction indicating approval of seed mixture.

2.2 SEED MIXTURE

- A. Seed Mixture: Coordinate with Architect/Engineer and Owner prior to seeding activities.

2.3 SOIL MATERIALS

- A. Topsoil: Fertile, agricultural soil, typical for locality, capable of sustaining vigorous plant growth, taken from drained site; free of subsoil, clay or impurities, plants, weeds and roots; pH value of minimum 5.4 and maximum 7.0.

2.4 ACCESSORIES

- A. Mulching Material: Oat or wheat straw, free from weeds, foreign matter detrimental to plant life, and dry. Hay or chopped cornstalks are not acceptable.
- B. Fertilizer: Recommended for grass, slow release nitrogen, biological materials, and biostimulant materials; of proportion necessary to eliminate deficiencies of topsoil.
- C. Soil pH Neutralizer: Recommended for planting and re-vegetating areas with acidic soils, as indicated by analysis.
- D. Water: Clean, fresh and free of substances or matter that could inhibit vigorous growth of grass.
- E. Erosion Fabric: Jute matting, open weave.
- F. Stakes: Softwood lumber, chisel pointed.
- G. String: Inorganic fiber.
- H. Edging: Galvanized steel.

2.5 TESTS

- A. Provide analysis of topsoil fill under provisions of Section 01 4000.
- B. Analyze to ascertain percentage of nitrogen, phosphorus, potash, soluble salt content, organic matter content, and pH value.
- C. Submit minimum 10 oz sample of topsoil proposed. Forward sample to approved testing laboratory in sealed containers to prevent contamination.
- D. Testing is not required if recent tests are available for imported topsoil. Submit these test results to the testing laboratory for approval. Indicate, by test results, information necessary to determine suitability.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify that prepared soil base is ready to receive the work of this Section.

3.2 PREPARATION

- A. Prepare subgrade in accordance with Section 31 2200.
- B. Place topsoil in accordance with Section 32 9119.
- C. Install edging at periphery of seeded areas in straight lines to consistent depth.

3.3 FERTILIZING

- A. Apply fertilizer in accordance with manufacturer's instructions.
- B. Apply after smooth raking of topsoil and prior to roller compaction.
- C. Do not apply fertilizer at same time or with same machine as will be used to apply seed.
- D. Mix thoroughly into upper 2 inches of topsoil.
- E. Lightly water to aid the dissipation of fertilizer.

3.4 SOIL NEUTRALIZER

- A. Apply in accordance with manufacturer's instructions.
- B. Apply after smooth raking of topsoil and prior to roller compaction.
- C. Do not apply soil neutralizer at same time or with same machine used to apply seed.
- D. Mix thoroughly into upper 2 inches of topsoil.
- E. Lightly water to aid dissipation.

3.5 SEEDING

- A. Apply seed at a rate of 5 lbs per 1000 sq ft evenly in two intersecting directions. Rake in lightly.
- B. Do not seed areas in excess of that which can be mulched on same day.
- C. Do not sow immediately following rain, when ground is too dry, or during windy periods.
- D. Roll seeded area with roller not exceeding 112 lbs.
- E. Immediately following seeding and compacting, apply mulch to a thickness of 1/8 inches. Maintain clear of shrubs and trees.
- F. Apply water with a fine spray immediately after each area has been mulched. Saturate to 4 inches of soil.
- G. Following germination, immediately re-seed areas without germinated seeds that are larger than 4 by 4 inches.

3.6 HYDROSEEDING

- A. Apply seeded slurry with a hydraulic seeder at a rate of 25 lbs per 1000 sq ft evenly in two intersecting directions.
- B. Do not hydroseed area in excess of that which can be mulched on same day.

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- C. Immediately following seeding, apply mulch to a thickness of 1/8 inches. Maintain clear of shrubs and trees.
- D. Apply water with a fine spray immediately after each area has been mulched. Saturate to 4 inches of soil.
- E. Following germination, immediately re-seed areas without germinated seeds that are larger than 4 by 4 inches.

3.7 PROTECTION

- A. Identify seeded areas with stakes and string around area periphery. Set string height to 18 inches. Space stakes at 12 inches.
- B. Cover seeded slopes where grade is 4 inches per foot or greater with erosion fabric. Roll fabric onto slopes without stretching or pulling.
- C. Lay fabric smoothly on surface, bury top end of each section in 6 inch deep excavated topsoil trench. Provide 12 inch overlap of adjacent rolls. Backfill trench and rake smooth, level with adjacent soil.
- D. Secure outside edges and overlaps at 36 inch intervals with stakes.
- E. Lightly dress slopes with topsoil to ensure close contact between fabric and soil.
- F. At sides of ditches, lay fabric laps in direction of water flow. Lap ends and edges minimum 6 inches.

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END OF SECTION 32 9219

**SECTION 32 9223
SODDING**

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Preparation of subsoil.
- B. Fertilizing.
- C. Sod installation.

1.2 RELATED REQUIREMENTS

- A. Section 31 2200 - Grading: Preparation of subsoil in preparation for work of this section.
- B. Section 32 0190 - Operation and Maintenance of Planting: Post-occupancy maintenance.
- C. Section 32 9119 - Landscape Grading: Topsoil placement and finish grading.

1.3 DEFINITIONS

- A. Weeds: Includes Dandelion, Jimsonweed, Quackgrass, Horsetail, Morning Glory, Rush Grass, Mustard, Lambsquarter, Chickweed, Cress, Crabgrass, Canadian Thistle, Nutgrass, Poison Oak, Blackberry, Tansy Ragwort, Bermuda Grass, Johnson Grass, Poison Ivy, Nut Sedge, Nimble Will, Bindweed, Bent Grass, Wild Garlic, Perennial Sorrel, and Brome Grass.

1.4 REFERENCE STANDARDS

- A. TPI (SPEC) - Guideline Specifications to Turfgrass Sodding; 2006.

1.5 SUBMITTALS

- A. See Section 01 3300 - Submittal Procedures, for submittal procedures.
- B. Certificate: Certify grass species and location of sod source.
- C. Certificate: Certify fertilizer and herbicide mixture approval by authority having jurisdiction.
- D. Maintenance Data: Include maintenance instructions, cutting method and maximum grass height; types, application frequency, and recommended coverage of fertilizer .
- E. Maintenance Contract.

1.6 QUALITY ASSURANCE

- A. Sod Producer: Company specializing in sod production and harvesting with minimum five years experience, and certified by the State of Tennessee.
- B. Installer Qualifications: Company approved by the sod producer.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Deliver sod on pallets. Protect exposed roots from dehydration.

- B. Do not deliver more sod than can be laid within 24 hours.

1.8 MAINTENANCE

- A. See Section 01 7000 - Execution and Closeout Requirements, for additional requirements relating to maintenance service.
- B. Provide a separate maintenance contract for specified maintenance service.

PART 2 PRODUCTS

2.1 REGULATORY REQUIREMENTS

- A. Comply with regulatory agencies for fertilizer and herbicide composition.
- B. Provide certificate of compliance from authority having jurisdiction indicating approval of fertilizer and herbicide mixture.

2.2 MATERIALS

- A. Sod: TPI (SPEC), Certified Turfgrass Sod quality; cultivated grass sod; type indicated in plant schedule on Drawings; with strong fibrous root system, free of stones, burned or bare spots; containing no more than 5 weeds per 1000 sq ft. Minimum age of 18 months, with root development that will support its own weight without tearing, when suspended vertically by holding the upper two corners.
- B. Topsoil: Fertile, agricultural soil, typical for locality, capable of sustaining vigorous plant growth, taken from drained site; free of subsoil, clay, or impurities, plants, weeds and roots; pH value of minimum 5.4 and maximum 7.0.
- C. Fertilizer: Recommended for grass, with fifty percent of the elements derived from organic sources; of proportion necessary to eliminate any deficiencies of topsoil, as indicated by analysis.
- D. Water: Clean, fresh and free of substances or matter that could inhibit vigorous growth of grass.

2.3 ACCESSORIES

- A. Wood Pegs: Softwood, sufficient size and length to ensure anchorage of sod on slope.
- B. Wire Mesh: Interwoven hexagonal metal wire mesh of 2 inch size.
- C. Edging: Galvanized steel.

2.4 SOURCE QUALITY CONTROL

- A. Provide analysis of topsoil fill under provisions of Section 01 4000.
- B. Analyze to ascertain percentage of nitrogen, phosphorus, potash, soluble salt content, organic matter content, and pH value.
- C. Submit minimum 10 oz sample of topsoil proposed. Forward sample to approved testing laboratory in sealed containers to prevent contamination.
- D. Testing is not required if recent tests are available for imported topsoil. Submit these test results to the testing laboratory for approval. Indicate, by test results, information necessary to determine suitability.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify that prepared soil base is ready to receive the work of this section.

3.2 PREPARATION

- A. Prepare subgrade in accordance with Section 31 2200.
- B. Place topsoil in accordance with Section 32 9119.
- C. Install edging at periphery of seeded areas in straight lines to consistent depth.

3.3 FERTILIZING

- A. Apply fertilizer in accordance with manufacturer's instructions.
- B. Apply after smooth raking of topsoil and prior to installation of sod.
- C. Apply fertilizer no more than 48 hours before laying sod.
- D. Mix thoroughly into upper 2 inches of topsoil.
- E. Lightly water to aid the dissipation of fertilizer.

3.4 LAYING SOD

- A. Moisten prepared surface immediately prior to laying sod.
- B. Lay sod immediately after delivery to site to prevent deterioration.
- C. Lay sod smooth and tight with no open joints visible, and no overlapping; stagger end joints 12 inches minimum. Do not stretch or overlap sod pieces.
- D. Where new sod adjoins existing grass areas, align top surfaces.
- E. Where sod is placed adjacent to hard surfaces, such as curbs, pavements, etc., place top elevation of sod 1/2 inch below top of hard surface.
- F. On slopes 6 inches per foot and steeper, lay sod perpendicular to slope and secure every row with wooden pegs at maximum 2 feet on center. Drive pegs flush with soil portion of sod.
- G. Prior to placing sod, on slopes exceeding 8 inches per foot or where indicated, place wire mesh over topsoil. Securely anchor in place with wood pegs sunk firmly into the ground.
- H. Water sodded areas immediately after installation. Saturate sod to 4 inches of soil.
- I. After sod and soil have dried, roll sodded areas to ensure good bond between sod and soil and to remove minor depressions and irregularities. Roll sodded areas with roller not exceeding 400 lbs.

3.5 MAINTENANCE

- A. See Section 32 0190 - Operation and Maintenance of Planting for post-occupancy maintenance.

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END OF SECTION 32 9223

**SECTION 32 9300
PLANTS**

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Preparation of subsoil.
- B. Topsoil bedding.
- C. New trees, plants, and ground cover.
- D. Relocated trees, plants, and ground cover.
- E. Mulch and Fertilizer.
- F. Maintenance.
- G. Tree Pruning.

1.2 RELATED REQUIREMENTS

- A. Section 32 0190 - Operation and Maintenance of Planting: Post-occupancy maintenance.
- B. Section 32 9119 - Landscape Grading: Topsoil placement and finish grading.

1.3 PRICE AND PAYMENT PROCEDURES

- A. Allowances:
 - 1. See Section 01 2100 - Allowances, for cash allowances affecting this section.
 - 2. Allowance includes purchase and delivery of trees, plants, and ground cover. Installation is included in this section and is part of the Contract Sum.
- B. Unit Prices:
 - 1. See Section 01 2200 - Unit Prices, for additional unit price requirements.
 - 2. Topsoil: By the cubic yard. Includes topsoil, placing topsoil.
 - 3. Plants: By the unit. Includes preparation of subsoil, placing topsoil, planting, watering and maintenance to specified time period.

1.4 DEFINITIONS

- A. Weeds: Include Dandelion, Jimsonweed, Quackgrass, Horsetail, Morning Glory, Rush Grass, Mustard, Lambsquarter, Chickweed, Cress, Crabgrass, Canadian Thistle, Nutgrass, Poison Oak, Blackberry, Tansy Ragwort, Bermuda Grass, Johnson Grass, Poison Ivy, Nut Sedge, Nimble Will, Bindweed, Bent Grass, Wild Garlic, Perennial Sorrel, and Brome Grass.
- B. Weeds: Any plant life not specified or scheduled.
- C. Plants: Living trees, plants, and ground cover specified in this Section, and described in ANSI Z60.1.

1.5 REFERENCE STANDARDS

- A. ANSI/AHIA Z60.2 - American Standard for Nursery Stock; 2025.
- B. ANSI A300 Part 1 - American National Standard for Tree Care Operations - Tree, Shrub, and Other Woody Plant Management - Standard Practices (Pruning); 2017.

1.6 SUBMITTALS

- A. See Section 01 3300 - Submittal Procedures, for submittal procedures.
- B. Certificate: Certify fertilizer and herbicide mixture approval by authority having jurisdiction.
- C. Certificate: Submit certificate for plants free of disease or hazardous insects; certified by federal department of agriculture; free of disease or hazardous insects.
- D. Maintenance Data: Include cutting and trimming method; types, application frequency, and recommended coverage of fertilizer.
- E. Submit list of plant life sources.
- F. Maintenance Contract.

1.7 QUALITY ASSURANCE

- A. Nursery Qualifications: Company specializing in growing and cultivating the plants with three years documented experience.
- B. Installer Qualifications: Company specializing in installing and planting the plants with three years experience.
- C. Tree Pruner Qualifications: Company specializing in pruning trees with proof of Arborist Certification.
- D. Tree Pruning: Comply with ANSI A300 Part 1.
- E. Maintenance Services: Performed by installer.
- F. Non-native, Invasive Plant Species: Do not introduce, grow, or cultivate plant species that are non-native to the ecosystem of the project site, and whose introduction causes or is likely to cause economic or environmental harm or harm to human health.
 - 1. Comply with laws regulating non-native and invasive plant species in the State in which the Project is located.

1.8 DELIVERY, STORAGE, AND HANDLING

- A. Deliver fertilizer in waterproof bags showing weight, chemical analysis, and name of manufacturer.
- B. Protect and maintain plant life until planted.
- C. Deliver plant life materials immediately prior to placement. Keep plants moist.

1.9 FIELD CONDITIONS

- A. Do not install plant life when ambient temperatures may drop below 35 degrees F or rise above 90 degrees F.
- B. Do not install plant life when wind velocity exceeds 30 mph.

1.10 WARRANTY

- A. See Section 01 7800 - Closeout Submittals, for additional warranty requirements.
- B. Provide one year warranty.

- C. Warranty: Include coverage for one continuous growing season; replace dead or unhealthy plants.
- D. Replacements: Plants of same size and species as specified, planted in the next growing season, with a new warranty commencing on date of replacement.

1.11 MAINTENANCE (SEE END OF SECTION)

- A. See Section 01 7000 - Execution and Closeout Requirements, for additional requirements relating to maintenance service.
- B. Provide a separate maintenance contract for specified maintenance service.
- C. Provide a separate maintenance contract for the service and maintenance of work specified in this section for 1 year from Date of Substantial Completion.

PART 2 PRODUCTS

2.1 REGULATORY REQUIREMENTS

- A. Comply with regulatory agencies for fertilizer and herbicide composition.
- B. Provide certificate of compliance from authority having jurisdiction indicating approval of plants, fertilizer and herbicide mixture.
- C. Plant Materials: Certified by federal department of agriculture; free of disease or hazardous insects.

2.2 PLANTS

- A. Plants: Species and size identified in plant schedule, grown in climatic conditions similar to those in locality of the work.

2.3 SOIL MATERIALS

- A. Topsoil: Excavated from site.
- B. Topsoil: Fertile, agricultural soil, typical for locality, capable of sustaining vigorous plant growth, taken from drained site; free of subsoil, clay or impurities, plants, weeds and roots; minimum pH value of 5.4 and maximum 7.0.

2.4 SOIL AMENDMENT MATERIALS

- A. Fertilizer: Containing fifty percent of the elements derived from organic sources; of proportion necessary to eliminate any deficiencies of topsoil, as indicated in analysis.
- B. Peat Moss: Shredded, loose, sphagnum moss; free of lumps, roots, inorganic material or acidic materials; minimum of 85 percent organic material measured by oven dry weight, pH range of 4 to 5; moisture content of 30 percent.
- C. Bone Meal: Raw, finely ground, commercial grade, minimum of 3 percent nitrogen and 20 percent phosphorous.
- D. Lime: Ground limestone, dolomite type, minimum 95 percent carbonates.
- E. Water: Clean, fresh, and free of substances or matter that could inhibit vigorous growth of plants.
- F. Herbicide: Pre-emergent for all planting areas.

2.5 MULCH MATERIALS

- A. Mulching Material: Shredded hardwood mulch, free of growth or germination inhibiting ingredients.
- B. Mulching Material: Oat or wheat straw, free from weeds, foreign matter detrimental to plant life, and dry. Hay or chopped cornstalks are not acceptable.

2.6 ACCESSORIES

- A. Wrapping Materials: Burlap.
- B. Stakes: Softwood lumber, pointed end.
- C. Cable, Wire, Eye Bolts and Turnbuckles: Non-corrosive, of sufficient strength to withstand wind pressure and resulting movement of plant life.
- D. Plant Protectors: Rubber sleeves over cable to protect plant stems, trunks, and branches.
- E. Membrane: 20 mil thick, clear polyethylene.
- F. Wrapping: Waterproof fabric.
- G. Tree Protectors: Metal with galvanized rings.

2.7 TOP SOIL MIX

- A. A uniform mixture of 1 part peat and 3 parts topsoil by volume.

2.8 SOURCE QUALITY CONTROL

- A. Provide analysis of topsoil; comply with requirements of Section 01 4000.
- B. Provide testing of imported topsoil.
- C. Analyze to ascertain percentage of nitrogen, phosphorus, potash, soluble salt and organic matter, and pH value.
- D. Submit minimum 10 oz sample of topsoil proposed. Forward sample to testing laboratory in sealed containers to prevent contamination.
- E. Testing is not required if recent tests are available for imported topsoil. Submit these test results to the testing laboratory for approval. Indicate, by test results, information necessary to determine suitability.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify that prepared subsoil and planters are ready to receive work.
- B. Saturate soil with water to test drainage.
- C. Verify that required underground utilities are available, in proper location, and ready for use.

3.2 PREPARATION OF SUBSOIL

- A. Prepare subsoil to eliminate uneven areas. Maintain profiles and contours. Make changes in grade gradual. Blend slopes into level areas.

- B. Remove foreign materials, weeds and undesirable plants and their roots. Remove contaminated subsoil.
- C. Scarify subsoil to a depth of 3 inches where plants are to be placed. Repeat cultivation in areas where equipment, used for hauling and spreading topsoil, has compacted subsoil.
- D. Dig pits and beds 6 inches larger than plant root system.

3.3 PLACING TOPSOIL

- A. Spread topsoil to a minimum depth of 4 inches over area to be planted. Rake smooth.
- B. Place topsoil during dry weather and on dry unfrozen subgrade.
- C. Remove vegetable matter and foreign non-organic material from topsoil while spreading.
- D. Grade topsoil to eliminate rough, low or soft areas, and to ensure positive drainage.
- E. Install topsoil into pits and beds intended for plant root balls, to a minimum thickness of 6 inches.

3.4 FERTILIZING

- A. Apply fertilizer in accordance with manufacturer's instructions.
- B. Apply after initial raking of topsoil.
- C. Mix thoroughly into upper 2 inches of topsoil.
- D. Lightly water to aid the dissipation of fertilizer.

3.5 PLANTING

- A. Place plants for best appearance.
- B. Place plants for best appearance for review and final orientation by Architect.
- C. Set plants vertical.
- D. Remove non-biodegradable root containers.
- E. Set plants in pits or beds, partly filled with prepared plant mix, at a minimum depth of 6 inches under each plant. Remove burlap, ropes, and wires, from the root ball.
- F. Place bare root plant materials so roots lie in a natural position. Backfill soil mixture in 6 inch layers. Maintain plant life in vertical position.
- G. Saturate soil with water when the pit or bed is half full of topsoil and again when full.
- H. Saturate soil with water when the pit or bed is half full of topsoil and again when full.

3.6 PLANT SUPPORT

- A. Brace plants vertically with plant protector wrapped guy wires and stakes to the following:
 - 1. Tree Caliper: 1 inch; Tree Support Method: 1 stake with one tie
 - 2. Tree Caliper: 1 to 2 inches; Tree Support Method: 2 stakes with two ties
 - 3. Tree Caliper: 2 to 4 inches; Tree Support Method: 3 guy wires with eye bolts and turn buckles
 - 4. Tree Caliper: Over 4 inches; Tree Support Method: 4 guy wires with eye bolts and turn buckles

3.7 TREE PRUNING

- A. Prune trees as recommended in ANSI A300 Part 1.
- B. Prune newly planted trees as required to remove dead, broken, and split branches.

3.8 FIELD QUALITY CONTROL

- A. Perform field inspection and testing in accordance with Section 01 4000.
- B. Plants will be rejected if a ball of earth surrounding roots has been disturbed or damaged prior to or during planting.

3.9 MAINTENANCE

- A. See Section 32 0190 - Operation and Maintenance of Planting for post-occupancy maintenance.
- B. Provide maintenance at no extra cost to Owner; Owner will pay for water.
- C. See Section 01 7000 - Execution and Closeout Requirements, for additional requirements relating to maintenance service.
- D. Provide a separate maintenance contract for specified maintenance service.
- E. Maintain plant life for three months after Date of Substantial Completion.
- F. Maintain plant life immediately after placement and until plants are well established and exhibit a vigorous growing condition. Continue maintenance until termination of warranty period.
- G. Irrigate sufficiently to saturate root system and prevent soil from drying out.
- H. Cultivate and weed plant beds and tree pits.
- I. Remove dead or broken branches and treat pruned areas or other wounds.
- J. Neatly trim plants where necessary.
- K. Immediately remove clippings after trimming.
- L. Control growth of weeds. Apply herbicides in accordance with manufacturer's instructions.
- M. Control insect damage and disease. Apply pesticides in accordance with manufacturers instructions.
- N. Remedy damage from use of herbicides and pesticides.
- O. Replace mulch when deteriorated.
- P. Maintain wrappings, guys, turnbuckles, and stakes. Adjust turnbuckles to keep guy wires tight. Repair or replace accessories when required.

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END OF SECTION 32 9300

**SECTION 33 3113
SITE SANITARY SEWERAGE GRAVITY PIPING**

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Sanitary sewerage drainage piping, fittings, and accessories.
- B. Connection of building sanitary drainage system to municipal sewers.

1.2 RELATED REQUIREMENTS

- A. Section 31 2316 - Excavation: Excavating of trenches.
- B. Section 31 2316.13 - Trenching: Excavating, bedding, and backfilling.
- C. Section 31 2323 - Fill: Bedding and backfilling.

1.3 DEFINITIONS

- A. Bedding: Fill placed under, beside and directly over pipe, prior to subsequent backfill operations.

1.4 REFERENCE STANDARDS

- A. ASTM A74 - Standard Specification for Cast Iron Soil Pipe and Fittings; 2021.
- B. ASTM A746 - Standard Specification for Ductile Iron Gravity Sewer Pipe; 2018 (Reapproved 2022).
- C. ASTM C12 - Standard Practice for Installing Vitrified Clay Pipe Lines; 2022a.
- D. ASTM C14 - Standard Specification for Nonreinforced Concrete Sewer, Storm Drain, and Culvert Pipe; 2020.
- E. ASTM C14M - Standard Specification for Nonreinforced Concrete Sewer, Storm Drain, and Culvert Pipe (Metric); 2020.
- F. ASTM C76 - Standard Specification for Reinforced Concrete Culvert, Storm Drain, and Sewer Pipe; 2022a.
- G. ASTM C76M - Standard Specification for Reinforced Concrete Culvert, Storm Drain, and Sewer Pipe (Metric); 2022a.
- H. ASTM C425 - Standard Specification for Compression Joints for Vitrified Clay Pipe and Fittings; 2022.
- I. ASTM C443 - Standard Specification for Joints for Concrete Pipe and Manholes, Using Rubber Gaskets; 2021.
- J. ASTM C443M - Standard Specification for Joints for Concrete Pipe and Manholes, Using Rubber Gaskets (Metric); 2021.
- K. ASTM C564 - Standard Specification for Rubber Gaskets for Cast Iron Soil Pipe and Fittings; 2020a.
- L. ASTM C700 - Standard Specification for Vitrified Clay Pipe, Extra Strength, Standard Strength, and Perforated; 2018 (Reapproved 2022).
- M. ASTM D1785 - Standard Specification for Poly(Vinyl Chloride) (PVC) Plastic Pipe, Schedules 40, 80, and 120; 2021a.

- N. ASTM D2321 - Standard Practice for Underground Installation of Thermoplastic Pipe for Sewers and Other Gravity-Flow Applications; 2020.
- O. ASTM D2680 - Standard Specification for Acrylonitrile-Butadiene-Styrene (ABS) and Poly(Vinyl Chloride) (PVC) Composite Sewer Piping; 2020.
- P. ASTM D2729 - Standard Specification for Poly(Vinyl Chloride) (PVC) Sewer Pipe and Fittings; 2021.
- Q. ASTM D3034 - Standard Specification for Type PSM Poly(Vinyl Chloride) (PVC) Sewer Pipe and Fittings; 2023.
- R. ASTM D3350 - Standard Specification for Polyethylene Plastics Pipe and Fittings Materials; 2021.
- S. AWWA C111/A21.11 - Rubber-Gasket Joints for Ductile-Iron Pressure Pipe and Fittings; 2023.

1.5 ADMINISTRATIVE REQUIREMENTS

- A. Coordination: Coordinate the installation of sanitary sewer with size, location and installation of service utilities.
- B. Preinstallation Meeting: Conduct a preinstallation meeting one week prior to the start of the work of this section; require attendance by all affected installers.
- C. Sequencing: Ensure that utility connections are achieved in an orderly and expeditious manner.

1.6 SUBMITTALS

- A. See Section 01 3300 - Submittal Procedures, for submittal procedures.
- B. Product Data: Provide data indicating pipe, pipe accessories.
- C. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.
- D. Manufacturer's Installation Instructions: Indicate special procedures required to install Products specified.
- E. Field Quality Control Submittals: Document results of field quality control testing.
- F. Project Record Documents:
 - 1. Record location of pipe runs, connections, and invert elevations.
 - 2. Identify and describe unexpected variations to subsoil conditions or discovery of uncharted utilities.

PART 2 PRODUCTS

2.1 SEWER PIPE MATERIALS

- A. Provide products that comply with applicable code(s).
- B. Plastic Pipe: ASTM D2729, Poly(Vinyl Chloride) (PVC) material; inside nominal diameter of 8 inches, bell and spigot style solvent sealed joint end.
- C. Joint Seals: Mechanical clamp ring type, stainless steel expanding and contracting sleeve, neoprene ribbed gasket for positive seal.
- D. Fittings: Same material as pipe molded or formed to suit pipe size and end design, in required tee, bends, elbows, cleanouts, reducers, traps and other configurations required.

2.2 PIPE ACCESSORIES

- A. Trace Wire: Magnetic detectable conductor, clear plastic covering, imprinted with "Sewer Service" in large letters.
- B. Casing Spacer: Polyethylene spacer designed to maintain pipe casing integrity.

2.3 BEDDING AND COVER MATERIALS

- A. Pipe Bedding Material: As specified in Section 31 2323.
- B. Pipe Cover Material: As specified in Section 31 2323.

PART 3 EXECUTION

3.1 GENERAL

- A. Perform work in accordance with applicable code(s).

3.2 TRENCHING

- A. See Section 31 2316.13 for additional requirements.
- B. Hand trim excavation for accurate placement of pipe to elevations indicated.
- C. Backfill around sides and to top of pipe with cover fill, tamp in place and compact, then complete backfilling.

3.3 INSTALLATION - PIPE

- A. Verify that trench cut is ready to receive work and excavations, dimensions, and elevations are as indicated on layout drawings.
- B. Install pipe, fittings, and accessories in accordance with manufacturer's instructions. Seal watertight.
 - 1. Plastic Pipe: Also comply with ASTM D2321.
- C. Lay pipe to slope gradients noted on layout drawings; with maximum variation from true slope of 1/8 inch in 10 feet.
- D. Connect to municipal sewer system , through installed sleeves.
- E. Install trace wire 6 inches above top of pipe; coordinate with Section 31 2316.13.

3.4 FIELD QUALITY CONTROL

- A. Perform field inspection and testing in accordance with Section 01 4000.
- B. If tests indicate Work does not meet specified requirements, remove Work, replace and retest at no cost to Owner.

3.5 PROTECTION

- A. Protect pipe and bedding cover from damage or displacement until backfilling operation is in progress.

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END OF SECTION 33 3113

**SECTION 33 3913
MANHOLES**

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Manholes shall be precast with eccentric cones unless otherwise approved by the Engineer.

1.2 QUALITY ASSURANCE

- A. Material Testing: All precast reinforced concrete manhole risers and tops specified herein shall be tested and inspected by a commercial testing laboratory approved by the Engineer prior to delivery to the site, and all materials that fail to conform to these specifications shall be rejected. After delivery to the site, any materials that have been damaged in transit or are otherwise unsuitable for use in the work shall be rejected and removed from the site.
- B. The commercial testing laboratory shall be engaged and paid for by the Contractor.
- C. Manholes shall be watertight and of high quality.

1.3 SUBMITTALS

- A. Supply certified copies in duplicate for the inspection and acceptance reports of the testing laboratory to the Engineer before using the materials.
- B. Submit a certificate from the manufacturer of the castings indicating that they meet all applicable requirements of these specifications.

PART 2 - PRODUCTS

2.1 CONCRETE MASONRY

- A. Reinforced, meeting the applicable requirements of Section 03 303__, Concrete for Utility Lines.

2.2 STEEL TRAFFIC GRADE ADJUSTMENT RING (FOR CASTING ADJUSTMENT)

- A. Adjustment rings shall conform to ASTM A48, Class 30, material specifications. The adjustment ring shall be of a traffic design and no more than 2-inches in height. The extension ring shall be No. 2500 as manufactured by John Bouchard & Son, Company, or equal. Reinforced concrete adjustment rings shall also be allowed.

2.3 MORTAR

- A. Composed of one part Portland cement and two parts sand (volumetric measure) thoroughly mixed in a tight box, with water added gradually and mixed continually until mortar has attained the proper consistency for use in the work; prepared only in such quantities as needed for immediate use; mortar mixed for more than 30 minutes, re-tempered, or previously set will not be allowed.

2.4 GRAY IRON CASTINGS

- A. Cast iron conforming to the requirements of Class 30, ASTM A48; made accurately to the required dimensions; sound, smooth, clean, and free from blisters and other defects; not plugged or otherwise treated to remedy defects; machined so that covers rest securely in the frames with no rocking and are in contact with frame flanges for the entire perimeter of the contact surfaces; thoroughly cleaned subsequent to machining and, before rusting begins, painted with a bituminous coating so as to present a smooth finish;

tough and tenacious when cold, but not tacky and with no tendency to scale; and with the actual weight in pounds stenciled or printed by the manufacturer on each casting in white paint.

2.5 STANDARD FRAME AND COVER

- A. The standard frame and cover shall be traffic typed gray cast iron ASTM Designation A48 - Latest Revision, with a 24-inch (minimum) diameter opening weighing not less than 410 pounds. The covers shall be the solid self-sealing type with no holes except watertight pick notches. The surface between the cover and frame shall fit smoothly without rocking and shall be thoroughly cleaned. The gray iron castings shall be painted with a bituminous coating.
- B. Cover shall be of the solid indented type with the words "Sanitary Sewer" cast in raised letters thereon. Manhole frames and covers shall be Vulcan Foundry #V-1115 or approved equal.

2.6 WATERTIGHT MANHOLES FRAMES AND COVERS

- A. The manhole frames shall be set in the same manner prescribed for standard frames except special attention shall be paid to securing a watertight connection to the manhole barrel.
- B. The watertight manhole frame and cover shall be a traffic type of grey cast iron ASTM A48-64 with a 24 inch diameter minimum clear opening weighing not less than 550 pounds and shall be of the two-cover design as shown on the Plans.
- C. The surface cover shall be the solid type with no holes except watertight pick notches or a heavy lifting ring. The surface between this cover and frame shall fit without rocking. The inner cover shall be of the solid type with no holes, shall have not less than two lifting handles and shall have a neoprene sealing gasket at last 3/8 inch diameter cross-section. The inner cover shall be mechanically sealed by means of a removable metal bar located over the inner cover with a centrally-located stainless steel tightening bolt. This bolt shall be fitted for a tee-handle or bent-handle for turning which shall be included with each cover. The bolt shall have Acme threads for durability. The inner cover shall have appropriate reinforcing ribs to prevent cracking or distortion when tightened. The inner cover shall have sufficient clearance to allow easy installation of the cover. Manhole frame and cover shall be Vulcan #V-2150-3 or approved equal.

2.7 MANHOLE JOINT SEALANT FOR PRECAST MANHOLES

- A. Flexible plastic sealant for joints in pre-cast manhole sections shall provide permanently flexible watertight joints, shall remain workable over wide temperature range and shall not shrink, harden or oxidize upon aging. Material shall be butyl resin sealant ConSeal CS-102 or CS-202 as manufactured by Concrete Sealants, Inc. of New Carlisle, Ohio, RUB'R-NEK L-T-M manufactured by K.T. Snyder Company, Inc. of Houston, Texas, or other approved equal.

2.8 MANHOLE JOINT WRAP

- A. Joint wrap, at all joints between riser sections, shall be installed in accordance with ASTM C909. Joint wrap shall be 6-inch minimum width, and as manufactured by Press-Seal Gasket Corporation of Fort Wayne, Indiana, or equal.

2.9 MANHOLE STEPS

- A. Manhole steps shall be made of copolymer polypropylene plastic meeting the latest revision of ASTM D4101-08, Type II, Grade 16906 and shall have a 1/2 inch diameter Grade 60 reinforcing rod meeting the latest revision of ASTM A615 through its center. Each step shall be 12 inches in width and capable of carrying a load of 1,000 pounds in the center of the step when projected 6 inches from the wall. Each step shall be equipped with non-skid grooves.

2.10 MANHOLE INVERTS

- A. The bench or top portion of the invert shall slope to the flow line to prevent standing water.
- B. Services within the manhole, higher than 2 foot above the manhole invert, shall be constructed of brick laid on edge and longitudinally with the invert channel. Inside face joints shall be not more than 1/4 inch thick. The brick shall smoothly transition to the manhole invert.

2.11 RESILIENT PIPE CONNECTIONS AT MANHOLES

- A. Resilient pipe connectors shall be manufactured in accordance with ASTM C923 and shall provide a positive watertight joint and minimum of 10 degrees deflection in any direction. There shall be no water leakage through the connector when pipe is in its maximum deflected position. Connectors shall be manufactured of durable construction. Connectors shall be manufactured of durable rubber which offers superior resistance to water, sewage, oils, acid, ozone, weathering and aging. Conical type flexible boot of the proper size to match the OD of the connection pipes shall be clamped securely to the cut out in the manhole wall and to the pipe by means of stainless steel clamps or bands. The void area between the pipe and the connector shall be sealed with an approved flexible gasket material. The flexible boot shall meet ASTM C443. Connectors shall be as manufactured by the KOR-N-SEAL Company of Milford, New Hampshire, Press-Boot by Press-Seal Gasket Corporation of Fort Wayne, Indiana, or equal.
- B. Compression-type connectors cast integrally into the manhole wall shall be equivalent to the A-Lok Manhole Pipe Connector as manufactured by A-Lok Products, Inc. Compression-type connectors shall only be used when specifically called for on the drawings.

2.12 PRE-CAST CONCRETE MANHOLES

- A. Precast concrete rings shall be constructed using standard forms and shall conform to ASTM C478 including steel reinforcement.
- B. The manhole sidewall shall be adjusted with either steel or concrete grade adjustment rings as required to bring the casting to grade.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Dewater sufficiently to maintain the ground water level at or below the bottom of the manhole foundation prior to and during placement of the foundation.
- B. Obtain an adequate foundation for all manhole structures by removing and replacing unsuitable material with well graded granular material, by tightening with coarse rock, or by such other means as provided for foundation preparation of the connected sewers or as directed by the Engineer. Wherever water is encountered at the site, place all cast in place bases or monolithic structures on a one-piece waterproof membrane to prevent any movement of water into the fresh concrete.

3.2 INSTALLATION

- A. Thoroughly wet and then completely fill all lift holes and all interior joints between precast elements with non-shrink grout. Smooth them inside to ensure water tightness.
- B. Manhole inverts shall be constructed of concrete or mortared masonry fill and may, at the Contractor's option, be covered with cement mortar to the approximate cross section of the sewers connected to them. Make any necessary changes in cross sections gradually from side to side of the manhole; make changes in direction of flow of the sewers to a true curve of as large a radius as is permitted by the size of the manhole.

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- C. Place backfill by hand around the manhole and to a distance of at least one pipe length into each trench, and tamp with selected material up to an elevation of 12 inch above the crown of all entering pipes. Continue backfilling in accordance with the requirements for trenching backfilling.
- D. Vacuum Testing of New Manholes:
1. All lifting holes shall be filled and pointed with an approved non-shrinking mortar.
 2. Manholes are to be tested immediately after assembly and before backfilling. No standing water shall be allowed in the manhole excavation which may affect the accuracy of the test.
 3. All pipes and other openings into the manhole shall be suitably plugged in such a manner as to prevent displacement of the plugs while the vacuum is drawn.
 4. Installation and operation of vacuum equipment and indicating devices shall be in accordance with equipment specifications and instructions provided by the manufacturer.
 5. The test head shall be placed to include the manhole casting (frame).
 6. A vacuum of 10 inches of mercury shall be drawn. The time for the vacuum to drop to 9 inches of mercury shall be recorded.
-

Manholes Depth	Diameter	Time to Drop 1 Inch Hg
10 feet or less	4 feet	60 seconds
10.1 feet to 15 feet	4 feet	75 seconds
15.1 feet to 25 feet	4 feet	90 seconds

7. If the manhole fails to test, necessary repairs shall be made and vacuum test repeated until the manhole passes the test.
8. If the manhole joint mastic or gasket is displaced during the vacuum test, the manhole shall be disassembled and the seal replaced.

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END OF SECTION 33 3913

**SECTION 33 4000
STORM DRAINAGE**

PART 1 - GENERAL

1.1 SUMMARY

- A. Related Sections include the following:
 - 1. Division 31 Section "Earthwork".

1.2 DEFINITIONS

- A. RCP: Reinforced concrete pipe.

1.3 SUBMITTALS

- A. Shop Drawings: Include plans, elevations, details, and attachments for the following:
 - 1. Precast concrete manholes and other structures, including frames, covers, and grates.

1.4 DELIVERY, STORAGE, AND HANDLING

- A. Protect pipe, pipe fittings, and seals from dirt and damage.
- B. Handle precast concrete manholes and other structures according to manufacturer's written instructions.

1.5 PROJECT CONDITIONS

- A. Site Information: Perform site reconnaissance, research public utility records, and verify existing utility locations.
- B. Locate existing structures and piping to be closed and abandoned.
- C. Existing Utilities: Do not interrupt utilities serving facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary utility services according to requirements indicated:
 - 1. Notify Engineer and Owner not less than three days in advance of proposed utility interruptions.
 - 2. Do not proceed with utility interruptions without Engineer's written permission.

PART 2 - PRODUCTS

2.1 PIPES AND FITTINGS

- A. Provide pipe and pipe fitting materials that are compatible with one another.
- B. Reinforced-Concrete Sewer Pipe and Fittings: ASTM C 76, Class III, Wall B, for gasketed joints.
 - 1. Gaskets: ASTM C 443, rubber.
- C. Reinforced-Concrete Arch Pipe: ASTM C 506, Class IV, for banded joints.
 - 1. Sealing Bands: ASTM C 877, Type I.
- D. Reinforced-Concrete Elliptical Pipe: ASTM C 507, Class IV, for banded joints.
 - 1. Pattern: Type HE, horizontal.
 - 2. Pattern: Type VE, vertical.
 - 3. Sealing Bands: ASTM C 877, Type I.

2.2 STORM DRAINAGE STRUCTURES

- A. Normal-Traffic Precast Concrete: ASTM C 478, precast, reinforced concrete, of depth indicated, with provision for rubber gasketed joints.
 - 1. Dimensions: 48 inches minimum, unless otherwise indicated.
 - 2. Base Section: 8-inch minimum thickness for floor slab and 4-inch minimum thickness for walls and base riser section, and having separate base slab or base section with integral floor.
 - 3. Riser Sections: 5-inch minimum thickness and lengths to provide depth indicated.
 - 4. Manhole Top Section: Eccentric-cone type, unless concentric-cone or flat-slab-top type is indicated. Top of cone of size that matches grade rings.
 - 5. Gaskets: ASTM C 443, rubber, or as noted.
 - 6. Grade Rings: Include reinforced-concrete rings, of 9-inch maximum thickness, that match 24-inch-diameter frame and cover. Brick may be used for grade rings.
 - 7. Steps: Fiberglass or polypropylene individual steps. Include width that allows worker to place both feet on one step and is designed to prevent lateral slippage off step. Cast or anchor into base, riser, and top section sidewalls with steps at 12- to 16-inch intervals. Omit steps for manholes less than 60 inches deep.
 - 8. Pipe Connectors: ASTM C 923, resilient, of size required, for each pipe connecting to base section.
- B. Cast-in-Place Concrete: Construct of reinforced-concrete bottom, walls, and top; designed according to ASTM C 890 for A-16, heavy-traffic, structural loading; of depth, shape, dimensions, and appurtenances indicated.
- C. Frames and Grates: ASTM A 48, Grade 60-40-18, gray iron designed for heavy-duty service. Include 24-inch ID by 7- to 9-inch riser with 4-inch minimum width flange, and 26-inch- diameter flat grate with small, square or short-slotted drainage openings.
 - 1. Grate Free Area: Approximately 50 percent, unless otherwise indicated.

2.3 STORMWATER INLETS

- A. Area Inlets: Made with horizontal opening, of materials and dimensions according to utility standards when appropriate. Include heavy-duty frames and grates.
- B. Frames and Grates: Heavy-duty frames and grates according to utility standards when appropriate.
- C. Frames and Grates and Covers: Dimensions, opening pattern, free area, and other attributes indicated.
 - 1. Material: ASTM A 48, Class 30 minimum, gray-iron casting.
 - 2. Grate Free Area: Approximately 50 percent, unless otherwise indicated.

2.4 CONCRETE

- A. General: Cast-in-place concrete according to ACI 318, ACI 350R, and the following:
 - 1. Cement: ASTM C 150, Type II.
 - 2. Fine Aggregate: ASTM C 33, sand.
 - 3. Coarse Aggregate: ASTM C 33, crushed gravel.
 - 4. Water: Potable.
- B. Portland cement Design Mix: 3000 psi minimum, with 0.45 maximum water-cementitious ratio.
 - 1. Reinforcement Fabric: ASTM A 185, steel, welded wire fabric, plain.
 - 2. Reinforcement Bars: ASTM A 615/A 615M, Grade 60, deformed steel.

2.5 PIPE OUTLETS

- A. Head Walls: Precast reinforced concrete, with apron and tapered sides.
- B. Riprap Apron: Broken, irregular size and shape, uniform graded stone.

PART 3 - EXECUTION

3.1 EARTHWORK

- A. Excavating, trenching, and backfilling are specified in Division 31 Section "Earthwork."

3.2 PIPING APPLICATIONS

- A. General: Include silt-tight joints, unless watertight joints are indicated.
- B. Refer to Part 2 of this Section for detailed specifications for pipe and fitting products listed below. Use pipe, fittings, and joining methods according to applications indicated.
- C. Gravity-Flow Piping: Use the following:
 - 1. Reinforced-concrete sewer pipe and fittings, gaskets, and gasketed joints. Do not use non-reinforced pipe instead of reinforced concrete pipe.

3.3 INSTALLATION, GENERAL

- A. Install piping beginning at low point, true to grades and alignment indicated with unbroken continuity of invert. Place bell ends of piping facing upstream. Install gaskets, seals, sleeves, and couplings according to manufacturer's written instructions for use of lubricants, cements, and other installation requirements. Maintain swab or drag in line, and pull past each joint as it is completed.
- B. Use structures for changes in direction and size, unless fittings are indicated. Use fittings for branch connections, unless direct tap into existing sewer is indicated.

3.4 PIPE JOINT CONSTRUCTION AND INSTALLATION

- A. General: Join and install pipe and fittings according to installations indicated.
- B. Install with top surfaces of components, except piping, flush with finished surface.
- C. Concrete Pipe and Fittings: Install according to ACPA's "Concrete Pipe Installation Manual." Use the following seals:
 - 1. Round Pipe and Fittings: ASTM C 443, rubber gaskets.
 - 2. Elliptical Pipe: ASTM C 877, Type I, sealing bands.
 - 3. Arch Pipe: ASTM C 877, Type I, sealing bands.

3.5 CONCRETE STRUCTURE INSTALLATION

- A. General: Install manholes and structures, complete with appurtenances and accessories indicated.
- B. Form continuous concrete channels and benches between inlets and outlet.
- C. Set tops of frames and covers flush with finished surface of structures that occur in pavements. Set tops 3 inches above finished surface elsewhere, unless otherwise indicated.
- D. Install precast concrete sections with gaskets according to ASTM C 891.
- E. Construct cast-in-place structures as indicated.

3.6 STORM DRAINAGE INLET AND OUTLET INSTALLATION

- A. Construct inlets to sizes and shapes indicated.
- B. Set frames and grates to elevations indicated.

- C. Construct inlet head walls, aprons, and sides of reinforced concrete, as indicated.
- D. Install outlets that spill onto grade with flared end sections that match pipe where indicated.

3.7 CONCRETE PLACEMENT

- A. Place cast-in-place concrete according to ACI 318 and ACI 350R.

3.8 FIELD QUALITY CONTROL

- A. Clear interior of piping and structures of dirt and superfluous material as work progresses. Maintain swab or drag in piping, and pull past each joint as it is completed.
 - 1. In large, accessible piping, brushes and brooms may be used for cleaning.
 - 2. Place plug in end of incomplete piping at end of day and when work stops.
 - 3. Flush piping between manholes and other structures to remove collected debris, if required by authorities having jurisdiction.
- B. Inspect interior of piping to determine whether line displacement or other damage has occurred. Inspect after approximately 24 inches of backfill is in place, and again at completion of Project.
 - 1. Defects requiring correction include the following:
 - a. Alignment: Less than full diameter of inside of pipe is visible between structures.
 - b. Deflection: Flexible piping with deflection that prevents passage of ball or cylinder of size not less than 92.5 percent of piping diameter.
 - c. Crushed, broken, cracked, or otherwise damaged piping.
 - d. Infiltration: Water leakage into piping.
 - e. Exfiltration: Water leakage from or around piping.
 - 2. Replace defective piping using new materials, and repeat inspections until defects are within allowances specified.
 - 3. Reinspect and repeat procedure until results are satisfactory.
- C. Test new piping systems, and parts of existing systems that have been altered, extended, or repaired, for leaks and defects.
 - 1. Do not enclose, cover, or put into service before inspection and approval.
 - 2. Test completed piping systems according to authorities having jurisdiction.
 - 3. Schedule tests and inspections by authorities having jurisdiction with at least 24 hours` advance notice.
 - 4. Replace leaking piping using new materials, and repeat testing until leakage is within allowances specified.

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END OF SECTION 33 4000

**SECTION 33 4213
STORMWATER CULVERTS**

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Pipe culvert, joints and accessories.
- B. Bedding and slope protection at pipe end.

1.2 RELATED REQUIREMENTS

- A. Section 31 2316 - Excavation: Excavating of trenches.
- B. Section 31 2316.13 - Trenching: Excavating, bedding, and backfilling.
- C. Section 31 2323 - Fill: Bedding and backfilling.
- D. Section 31 3700 - Riprap.

1.3 REFERENCE STANDARDS

- A. ASTM A929/A929M - Standard Specification for Steel Sheet, Metallic-Coated by the Hot-Dip Process for Corrugated Steel Pipe; 2018.
- B. ASTM C14 - Standard Specification for Nonreinforced Concrete Sewer, Storm Drain, and Culvert Pipe; 2020.
- C. ASTM C14M - Standard Specification for Nonreinforced Concrete Sewer, Storm Drain, and Culvert Pipe (Metric); 2020.
- D. ASTM C76 - Standard Specification for Reinforced Concrete Culvert, Storm Drain, and Sewer Pipe; 2022a.
- E. ASTM C76M - Standard Specification for Reinforced Concrete Culvert, Storm Drain, and Sewer Pipe (Metric); 2022a.
- F. ASTM C443 - Standard Specification for Joints for Concrete Pipe and Manholes, Using Rubber Gaskets; 2021.
- G. ASTM C443M - Standard Specification for Joints for Concrete Pipe and Manholes, Using Rubber Gaskets (Metric); 2021.

1.4 ADMINISTRATIVE REQUIREMENTS

- A. Preinstallation Meeting: Convene one week prior to commencing work of this section.

1.5 SUBMITTALS

- A. See Section 01 3300 - Submittal Procedures, for submittal procedures.
- B. Product Data: Provide data on pipe, fittings and accessories.
- C. Manufacturer's Installation Instructions: Indicate special procedures required to install Products specified.
- D. Accurately record actual locations of pipe runs, connections, and invert elevations.

- E. Identify and describe unexpected variations to subsoil conditions or discovery of uncharted utilities.

PART 2 PRODUCTS

2.1 CULVERT PIPE, GENERAL

- A. Regulatory Requirements: Comply with applicable code for materials and installation of the work of this section.

2.2 CONCRETE CULVERT PIPE

- A. Concrete Pipe: Reinforced, ASTM C76 (ASTM C76M), Class I with Wall Type A; mesh reinforcement; bell and spigot end joints:
 - 1. Shape: Circular with a nominal diameter of 36 inches.
- B. Reinforced Concrete Pipe Joint Device: ASTM C443 (ASTM C443M) rubber compression gasket joint.

2.3 BEDDING AND COVER MATERIALS

- A. Bedding: As specified in Section 31 2316.13.
- B. Cover: As specified in Section 31 2316.13.

2.4 ACCESSORIES

- A. Filter Fabric: Non-biodegradable, woven .
- B. Fill at Pipe Ends: Riprap as specified in Section 31 3700.

PART 3 EXECUTION

3.1 EXCAVATING

- A. See Section 31 2316.13 - Trenching for additional requirements.
- B. Excavate culvert trench to 12 inches below pipe invert. Hand trim excavation for accurate placement of pipe to elevations indicated.
- C. Place filter fabric over compacted backfill.

3.2 INSTALLATION - PIPE

- A. Verify that trench cut is ready to receive work and excavations, dimensions, and elevations are as indicated on layout drawings.
- B. Install pipe and accessories in accordance with manufacturer's instructions
- C. Lift or roll pipe into position. Do not drop or drag pipe over prepared bedding.
- D. Shore pipe to required position; retain in place until after compaction of adjacent fills. Ensure pipe remains in correct position and to required slope.
- E. Repair surface damage to pipe protective coating with two coats of compatible bituminous paint coating.
- F. Install culvert end gratings.

3.3 PIPE ENDS

- A. Place fill at pipe ends, as indicated.

3.4 TOLERANCES

- A. Lay pipe to alignment and slope gradients noted on layout drawings; with maximum variation from true slope of 1/8 inch in 10 feet.
- B. Maximum Variation from Intended Elevation of Culvert Invert: 1/2 inch.
- C. Maximum Offset of Pipe from True Alignment: 1 inch.
- D. Maximum Variation in Profile of Structure from Intended Position: 1 percent.

3.5 PROTECTION

- A. Protect pipe and bedding from damage or displacement until backfilling operation is in progress.

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END OF SECTION 33 4213

**SECTION 35 2421
MECHANICAL DREDGING**

PART 1 GENERAL

1.1 SUMMARY

- A. This Section includes mechanical removal of sediment from a waterbody using excavation equipment.
- B. Work includes:
 - 1. Mobilization and demobilization.
 - 2. Installation of erosion and sediment control measures.
 - 3. Mechanical dredging using excavator or clamshell.
 - 4. Material handling and stockpiling.
 - 5. Off-site transport and disposal (as applicable).
 - 6. Site restoration.

1.2 RELATED REQUIREMENTS

- 1. Section 01 5000 – Temporary Facilities and Controls
- 2. Section 01 33 00 – Submittal Procedures
- 3. Section 31 2319 – Dewatering
- 4. Section 31 23 16 – Excavation
- 5. Section 31 2323 – Fill
- 6. Section 31 2500 – Erosion and Sediment Control

1.3 REFERENCES

- A. USACE EM 1110-2-5025 – Dredging and Dredged Material Management
- B. ASTM D422 – Particle Size Analysis
- C. EPA NPDES Guidelines – Sediment and Erosion Control

1.4 SUBMITTALS

- A. Pre-Construction:
 - 1. Work Plan including equipment, sequence, and access.
 - 2. Environmental Protection Plan.
 - 3. Dredged Material Management Plan (DMMP).
 - 4. Traffic Management Plan
 - a. Dredged material is to be hauled to the City of Athens Public Waste facility at 219 Alford Street where it will be spread and stabilized. No additional CGP is required.
- B. Closeout:
 - 1. Daily production logs.

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2. Disposal manifests.
3. Final grading or bathymetric survey.

1.5 QUALITY ASSURANCE

- A. Contractor must have at least 3 years of experience with mechanical dredging.
- B. Perform pre- and post-dredging surveys with a licensed surveyor.
- C. Final elevations should be accurate to +/- 0.2 feet of what is shown on Design Drawings.
- D. Comply with all applicable environmental permits.

1.6 PROJECT CONDITIONS

- A. Coordinate access and staging with Owner.
- B. Implement turbidity controls as silt curtains as needed.
- C. Dewatering (if required) shall prevent off-site discharge of turbid water.

PART 2 PRODUCTS

2.1 DREDGING EQUIPMENT

- A. Use one or more of the following:
 1. Long-reach hydraulic excavator
 2. Clamshell or dragline crane
 3. Amphibious dredge (if required by site conditions)
- B. Equipment shall be appropriately sized for the sediment type and reach.

2.2 SUPPORT EQUIPMENT

- A. Dump trucks or tracked haulers for sediment transport.
- B. Water control devices (cofferdams, sandbags, pumps, silt curtains).
- C. Temporary haul roads or mats as needed.

PART 3 EXECUTION

3.1 PREPARATION

- A. Conduct pre-dredging topographic or bathymetric survey.
- B. Install erosion and sedimentation controls, including turbidity control devices, pumps, and dams.
- C. Protect adjacent vegetation, utilities, and structures.
- D. Establish access and staging areas.

3.2 DREDGING OPERATIONS

- A. Excavate sediments to limits and depths shown on Design Drawings.

- B. Maintain slope stability and avoid over excavation.
- C. Minimize turbidity and sediment resuspension.
- D. Maintain working surfaces and haul paths in safe condition.

3.3 MATERIAL HANDLING AND DISPOSAL

- A. Load and transport dredged material to 219 Alford St, Athens, TN 37303.
- B. Stockpile material on-site with containment and runoff control.
- C. Comply with testing and documentation requirements for disposal.

3.4 DEWATERING

- A. Dewater pond as described in Section 31 2319 and Design Drawings.

3.5 RESTORATION

- A. Restore all disturbed area to original or improved condition.
- B. Remove temporary access roads, mats, and staging areas.
- C. Grade, seed, and stabilize exposed soils per Design Drawings.

3.6 FIELD QUALITY CONTROL

- A. Conduct post-dredging survey to confirm target elevations.
- B. Inspect sediment containment and erosion control measures daily.

Maintain daily production logs and haul/disposal records.

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