This document contains the Plans and Specifications for

96" Stormwater Replacement – Phase 2 Segment II
Jamestown, North Dakota
EC23-00-100.01

The Plans and Specifications are contained in pages 3-458 and are set up to print two-sided (duplex) on 8½" x 11" paper.

The Plans are contained on pages 459 – 489 and are set up to print single-sided on 11" x 17" paper.

If your printer has the option to choose the paper source by PDF page size you may select it and the complete document will print single-sided to the correct sizes all at once. The page scaling option should be set to "none" or "actual size".

Up to date planholder lists can be found at www.questcdn.com.

SUBMITTED BID MUST CONTAIN THE FOLLOWING INFORMATION:

All bids must be placed in a sealed envelope upon the outside of which there is disclosed the following information:

a) The work covered by the bid.
b) The name of the person, firm or corporation submitting the bid.
c) A copy of the license or certificate of renewal thereof issued shall be enclosed in the required bid bond envelope.
d) Acknowledgement of each Addendum.
e) Bid Bond in outside envelope. (Signed by Principle or authorized person with copy of authorization.)
f) MBE/WBE solicitation form in the outside envelope.

All bids must contain a separate bid bond envelope attached to the actual bid envelope. The bid bond envelope shall contain the following information:

a) The bid bond for the project
b) The contractor's license

** The above listed items must be in the bid bond envelope located outside the actual bid envelope. If any of these items are not located in the bid bond envelope, the actual bid will not be opened.

The actual Bid envelope must contain:

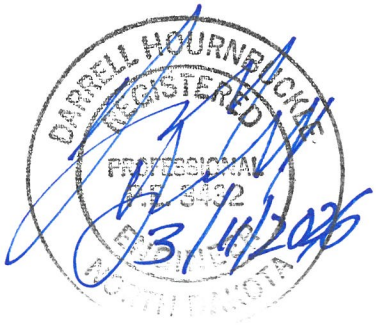
a) Bidder's Proposal made on a form prepared by the Engineer

This form is being provided for contractor convenience and is not meant to supersede the plans and specifications. Bidding requirements listed in the project specifications prevail over this form.

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PLANS AND SPECIFICATIONS
FOR
96" STORMWATER REPLACEMENT-PHASE 2 SEGMENT II
JAMESTOWN, NORTH DAKOTA
EC23-00-100.01

I, Darrell Hournbuckle, hereby certify that these Plans and Specifications were prepared by me or under my direct supervision. I further certify that I am a Registered Professional Engineer under the laws of the State of North Dakota.



Darrell Hournbuckle, PE

Date 3/11/2026

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INDEX

CONTRACTS

DIVISION 00 – PROCUREMENT AND CONTRACTING DOCUMENTS

00 11 13	Advertisement for Bids	2
00 21 13	Instructions to Bidders	12
00 41 00	Quote Forms	6
00 51 00	Notice of Award	2
00 52 13	Agreement Forms	10
00 55 00	Notice to Proceed	3
C-430	Bid Bond	2
C-451	Qualification Statement	15
RD 400-6	Compliance Statement	2
1048	USDA	2
1940-Q	RBS Exhibit A	1
00 61 13.13	Performance Bond Form	6
00 61 13.16	Payment Bond Form	6
00 62 76	Application for Payment Form	6
Attachment A.1		2
00 63 63	Change Order Form	4
00 65 00	Closeout Forms	19
C-626	Notice of Acceptability of Work	1
00 72 00	General Conditions	72
00 73 00	Supplementary Conditions	45
C-940	Work Change Directive	1
C942	Field Order	1

DIVISION 01 – GENERAL REQUIREMENTS

01 11 00	Summary of Work	2
01 14 19	Use of Site	1
01 21 00	Allowances	1
01 21 16	Contingency Allowances	1
01 22 19	Measurement and Payment	7
01 26 00	Contract Modification Procedures	3
01 29 00	Payment Procedures	2
01 29 73	Schedule of Values	1
01 31 00	Project Management and Coordination	4
01 33 00	Submittal Procedures	7
01 35 43	Environmental Procedures	2
01 45 00	Quality Control	3
01 45 29	Testing Laboratory Services	2
01 51 00	Temporary Utilities	2
01 55 26	Traffic Control	2
01 71 00	Examination and Preparation	3
01 77 00	Closeout Procedures	3
01 78 00	Closeout Submittals	2

TECHNICAL SPECS

DIVISION 3 – CONCRETE

03 05 00	Common Work Results for Concrete	6
03 06 00	Concrete Schedules	1
03 11 00	Concrete Forming	3
03 15 00	Concrete Accessories	3
03 20 00	Concrete Reinforcing	4
03 21 00	Reinforcing Steel	3
03 30 00	Cast-In-Place Concrete	4
03 31 00	Structural Concrete	7
03 35 00	Concrete Finishing	2
03 39 00	Concrete Curing	3
03 40 00	Precast Concrete	7
03 60 00	Grouting	2

DIVISION 31 – EARTHWORK

31 05 00	Common Work Results for Earthwork	6
31 10 00	Site Clearing	2
31 11 00	Clearing and Grubbing	2
31 14 13	Soil Stripping and Stockpiling	1
31 22 19	Finish Grading	2
31 23 00	Excavation and Fill	2
31 23 13	Subgrade Preparation	2
31 23 19	Dewatering	2
31 23 23.33	Flowable Fill	3
31 23 33	Trenching and Backfill	5
31 23 36	Structural Excavation and Fill	3
31 25 00	Erosion and Sedimentation Controls	4
31 37 00	Rip Rap	2
31 50 00	Excavation Support and Protection	2

DIVISION 32 – EXTERIOR IMPROVEMENTS

32 05 00	Common Work Results for Exterior Improvements	1
32 05 05	Selective Demolition for Exterior Improvements	4
32 11 13	Subgrade Modifications	2
32 11 23	Aggregate Base Course	3
32 12 16	Asphalt Paving	4
32 12 16.13	Asphaltic Seal Coats and Fog Coats	2
32 15 00	Aggregate Surfacing	2
32 16 23	Sidewalks	3
32 17 23	Pavement Markings	1
32 92 00	Turf and Grasses	8

DIVISION 33 – UTILITIES

33 05 00	Common Work Results for Utilities	8
33 05 61	Concrete Manholes	6
33 41 00	Storm Utility Drainage Piping	3
33 42 11.10	Stormwater Gravity Piping	2
33 49 00	Storm Drainage Structures	2

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ADVERTISEMENT FOR BIDS
CITY OF JAMESTOWN
JAMESTOWN, NORTH DAKOTA
96" STORMWATER REPLACEMENT-PHASE 2 SEGMENT II

General Notice

City of Jamestown (Owner) is requesting Bids for the construction of the following Project:

96" Stormwater Replacement-Phase 2 Segment II
EC23-00-100.01

Bids for the construction of the Project will be received at the **Jamestown City Hall** located at **102 Third Avenue SE, Jamestown, North Dakota**, until Monday, April 6, 2026, at **3:00 pm** local time. At that time the Bids received will be **publicly** opened and read.

The Project includes the following Work:
Total removal of 800 Feet of 96" CMP and replacement of 910 Feet with 96" Fiberglass reinforced pipe (FRP) connecting between existing storm sewer with surface restoration.

Bids are requested for the following Contract: **96" Stormwater Replacement-Phase 2 Segment II**

Owner anticipates that the Project's total bid price will be approximately $**4,325,000.00**. The Project has a completion date of November 21, 2026.

Obtaining the Bidding Documents

Information and Bidding Documents for the Project can be found at the following designated website:

Interstate.Engineering or www.questcdn.com

Bidding Documents may be downloaded from the designated website. Prospective Bidders are urged to register with the designated website as a plan holder, even if Bidding Documents are obtained from a plan room or source other than the designated website in either electronic or paper format. The designated website will be updated periodically with addenda, lists of registered plan holders, reports, and other information relevant to submitting a Bid for the Project. All official notifications, addenda, and other Bidding Documents will be offered only through the designated website. Neither Owner nor Engineer will be responsible for Bidding Documents, including addenda, if any, obtained from sources other than the designated website.

The Issuing Office for the Bidding Documents is:

Interstate Engineering
1903 12th Avenue SW
Jamestown, ND 58401

Prospective Bidders may obtain or examine the Bidding Documents at the Issuing Office on Monday through Friday between the hours of 8 am to 5 pm **and** may obtain copies of the Bidding Documents from the Issuing Office as described below. Partial sets of Bidding Documents will not be available from the Issuing Office. Neither Owner nor Engineer will be responsible for full or partial sets of Bidding Documents, including addenda, if any, obtained from sources other than the Issuing Office.

Bidding Documents may be purchased from the Issuing Office during the hours indicated above. Cost does not include shipping charges. Upon Issuing Office's receipt of payment, printed Bidding Documents or electronic documents on compact disk will be sent via the prospective Bidder's delivery service. The shipping charge amount will depend on the shipping method chosen. Bidding Documents are available for purchase in the following formats:

Format	Cost
Bidding Documents (including Full-Size Drawings)	$150.00
Electronic download of Bidding Documents from Interstate.Engineering or www.questcdn.com	$37.00

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Instructions to Bidders.

For all further requirements regarding bid submittal, qualifications, procedures, and contract award, refer to the Instructions to Bidders that are included in the Bidding Documents.

Domestic Preference

This project is subject to the American Iron and Steel (AIS) requirements instituted by Section 746 of Title VII of the Consolidated Appropriations Act of 2017 and subsequent annual appropriations for WWD programs.

The following waivers apply to this Contract: AIS De Minimis, and AIS Minor Component waivers

This Advertisement is issued by:

Owner: **City of Jamestown**
By: **Sarah Helleckson**
Title: **City Administrator**
Date: **February 19, 2026**

Publication Dates:
3/12/2026, 3/19/2026, 3/26/2026

END OF SECTION

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ATTACHMENT A.2 – DOMESTIC PREFERENCE *DE MINIMIS* LIST FORMAT

Notes to User:

1. This attachment is an example format for Contractors to use in maintaining a list of items to document the use of the De Minimis waiver of the Domestic Preference requirements.
2. This list or similar is required to be filled out throughout the construction Contract as needed.
3. The State Engineer may periodically ask to review this information.
4. At the Contract completion, this list, along with all Manufacturers' certifications, are to be given to the Engineer for delivery to the Owner.
5. This list is applicable for projects governed by BABAA. USDA RD State Office can provide guidance if AIS applies to the project instead.

DE MINIMIS COSTING WORKSHEET

Project Name: _____
Contract Name/# (if more than one) _____
Contractor (Company Name): _____
Representative: _____
Date: _____

Total Project Costs: $ _____
Allowable Total *De Minimis* Costs (5% of project costs) $ _____
Total Cost of all *De Minimis* Items $ _____
Remaining Amount Allowed for Future *De Minimis* Items $ _____

No.	Detailed Description and Manufacturer or Local Source of *De Minimis* Material	Quantity	Cost Per Item	Total Item Cost
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				

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ARTICLE 1—DEFINED TERMS

1.01 Terms used in these Instructions to Bidders have the meanings indicated in the General Conditions and Supplementary Conditions. Additional terms used in these Instructions to Bidders have the meanings indicated below:

A. *Issuing Office*—The office from which the Bidding Documents are to be issued, and which registers plan holders.

B. *Domestic Preference* – American Iron and Steel (AIS) requirements instituted by Section 746 of Title VII of the Consolidated Appropriations Act of 2017 and of 2017 and subsequent annual appropriations for WWD programs.

ARTICLE 2—BIDDING DOCUMENTS

2.01 Bidder shall obtain a complete set of Bidding Requirements and proposed Contract Documents (together, the Bidding Documents). See the Agreement for a list of the Contract Documents. It is Bidder's responsibility to determine that it is using a complete set of documents in the preparation of a Bid. Bidder assumes sole responsibility for errors or misinterpretations resulting from the use of incomplete documents, by Bidder itself or by its prospective Subcontractors and Suppliers.

2.02 Bidding Documents are made available for the sole purpose of obtaining Bids for completion of the Project and permission to download or distribution of the Bidding Documents does not confer a license or grant permission or authorization for any other use. Authorization to download documents, or other distribution, includes the right for plan holders to print documents solely for their use, and the use of their prospective Subcontractors and Suppliers, provided the plan holder pays all costs associated with printing or reproduction. Printed documents may not be re-sold under any circumstances.

2.03 Owner has established a Bidding Documents Website as indicated in the Advertisement or invitation to bid. Owner recommends that Bidder register as a plan holder with the Issuing Office at such website, and obtain a complete set of the Bidding Documents from such website. Bidders may rely that sets of Bidding Documents obtained from the Bidding Documents Website are complete, unless an omission is blatant. Registered plan holders will receive Addenda issued by Owner.

2.04 Bidder may register as a plan holder and obtain complete sets of Bidding Documents, in the number and format stated in the Advertisement or invitation to bid, from the Issuing Office. Bidders may rely that sets of Bidding Documents obtained from the Issuing Office are complete, unless an omission is blatant. Registered plan holders will receive Addenda issued by Owner.

2.05 Plan rooms (including construction information subscription services, and electronic and virtual plan rooms) may distribute the Bidding Documents, or make them available for examination. Those prospective bidders that obtain an electronic (digital) copy of the Bidding Documents from a plan room are encouraged to register as plan holders from the Bidding Documents Website or Issuing Office. Owner is not responsible for omissions in Bidding Documents or other documents obtained from plan rooms, or for a Bidder's failure to obtain Addenda from a plan room.

2.06 *Electronic Documents*

A. When the Bidding Requirements indicate that electronic (digital) copies of the Bidding Documents are available, such documents will be made available to the Bidders as Electronic Documents in the manner specified.

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1. Bidding Documents will be provided in Adobe PDF (Portable Document Format) (.pdf) that is readable by Adobe Acrobat Reader Version **2022 Standard/Pro** or later. It is the intent of the Engineer and Owner that such Electronic Documents are to be exactly representative of the paper copies of the documents. However, because the Owner and Engineer cannot totally control the transmission and receipt of Electronic Documents nor the Contractor's means of reproduction of such documents, the Owner and Engineer cannot and do not guarantee that Electronic Documents and reproductions prepared from those versions are identical in every manner to the paper copies.

B. Unless otherwise stated in the Bidding Documents, the Bidder may use and rely upon complete sets of Electronic Documents of the Bidding Documents, described in Paragraph 2.06.A above. However, Bidder assumes all risks associated with differences arising from transmission/receipt of Electronic Documents versions of Bidding Documents and reproductions prepared from those versions and, further, assumes all risks, costs, and responsibility associated with use of the Electronic Documents versions to derive information that is not explicitly contained in printed paper versions of the documents, and for Bidder's reliance upon such derived information.

C. Deleted

ARTICLE 3—QUALIFICATIONS OF BIDDERS

3.01 To demonstrate Bidder's qualifications to perform the Work, after submitting its Bid and within **7** days of Owner's request, Bidder must submit the following information:

A. Written evidence establishing its qualifications such as financial data, previous experience, and present commitments.

B. A written statement that Bidder is authorized to do business in the state where the Project is located, or a written certification that Bidder will obtain such authority prior to the Effective Date of the Contract.

C. Bidder's state or other contractor license number, if applicable.

D. Subcontractor and Supplier qualification information.

E. Other required information regarding qualifications.

3.02 Deleted

3.03 Bidder is to submit the following information with its Bid to demonstrate Bidder's qualifications to perform the Work:

A. Written evidence establishing its qualifications such as financial data, previous experience, and present commitments.

B. A written statement that Bidder is authorized to do business in the state where the Project is located, or a written certification that Bidder will obtain such authority prior to the Effective Date of the Contract.

C. Bidder's state or other contractor license number, if applicable.

D. Subcontractor and Supplier qualification information.

E. Other required information regarding qualifications.

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3.04 A Bidder's failure to submit required qualification information within the times indicated may disqualify Bidder from receiving an award of the Contract.

3.05 No requirement in this Article 3 to submit information will prejudice the right of Owner to seek additional pertinent information regarding Bidder's qualifications.

ARTICLE 4—PRE-BID CONFERENCE

4.01 A pre-bid conference will not be conducted for this Project.

4.02 Deleted

4.03 Deleted

4.04 Deleted

ARTICLE 5—SITE AND OTHER AREAS; EXISTING SITE CONDITIONS; EXAMINATION OF SITE; OWNER'S SAFETY PROGRAM; OTHER WORK AT THE SITE

5.01 *Site and Other Areas*

A. The Site is identified in the Bidding Documents. By definition, the Site includes rights-of-way, easements, and other lands furnished by Owner for the use of the Contractor. Any additional lands required for temporary construction facilities, construction equipment, or storage of materials and equipment, and any access needed for such additional lands, are to be obtained and paid for by Contractor.

5.02 *Existing Site Conditions*

A. *Subsurface and Physical Conditions; Hazardous Environmental Conditions*

1. The Supplementary Conditions identify the following regarding existing conditions at or adjacent to the Site:

a. Those reports of explorations and tests of subsurface conditions at or adjacent to the Site that contain Technical Data.

b. Those drawings known to Owner of existing physical conditions at or adjacent to the Site, including those drawings depicting existing surface or subsurface structures at or adjacent to the Site (except Underground Facilities), that contain Technical Data.

c. Reports and drawings known to Owner relating to Hazardous Environmental Conditions that have been identified at or adjacent to the Site.

d. Technical Data contained in such reports and drawings.

2. Owner will make copies of reports and drawings referenced above available to any Bidder on request. These reports and drawings are not part of the Contract Documents, but the Technical Data contained therein upon whose accuracy Bidder is entitled to rely, as provided in the General Conditions, has been identified and established in the Supplementary Conditions. Bidder is responsible for any interpretation or conclusion Bidder draws from any Technical Data or any other data, interpretations, opinions, or information contained in such reports or shown or indicated in such drawings.

3. If the Supplementary Conditions do not identify Technical Data, the default definition of Technical Data set forth in Article 1 of the General Conditions will apply.

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4. *Geotechnical Baseline Report/Geotechnical Data Report:* The Bidding Documents contain a Geotechnical Baseline Report (GBR) and Geotechnical Data Report (GDR).

   a. As set forth in the Supplementary Conditions, the GBR describes certain select subsurface conditions that are anticipated to be encountered by Contractor during construction in specified locations ("Baseline Conditions"). The GBR is a Contract Document.

   b. The Baseline Conditions in the GBR are intended to reduce uncertainty and the degree of contingency in submitted Bids. However, Bidders cannot rely solely on the Baseline Conditions. Bids should be based on a comprehensive approach that includes an independent review and analysis of the GBR, all other Contract Documents, Technical Data, other available information, and observable surface conditions. Not all potential subsurface conditions are baselined.

   c. Nothing in the GBR is intended to relieve Bidders of the responsibility to make their own determinations regarding construction costs, bidding strategies, and Bid prices, nor of the responsibility to select and be responsible for the means, methods, techniques, sequences, and procedures of construction, and for safety precautions and programs incident thereto.

   d. As set forth in the Supplementary Conditions, the GDR is a Contract Document containing data prepared by or for the Owner in support of the GBR.

B. *Underground Facilities:* Underground Facilities are shown or indicated on the Drawings, pursuant to Paragraph 5.05 of the General Conditions, and not in the drawings referred to in Paragraph 5.02.A of these Instructions to Bidders. Information and data regarding the presence or location of Underground Facilities are not intended to be categorized, identified, or defined as Technical Data.

5.03 *Other Site-related Documents*

A. In addition to the documents regarding existing Site conditions referred to in Paragraph 5.02.A, the following other documents relating to conditions at or adjacent to the Site are known to Owner and made available to Bidders for reference:

   1. **None**

   Owner will make copies of these other Site-related documents available to any Bidder on request.

B. Owner has not verified the contents of these other Site-related documents, and Bidder may not rely on the accuracy of any data or information in such documents. Bidder is responsible for any interpretation or conclusion Bidder draws from the other Site-related documents.

C. The other Site-related documents are not part of the Contract Documents.

D. Bidders are encouraged to review the other Site-related documents, but Bidders will not be held accountable for any data or information in such documents. The requirement to review and take responsibility for documentary Site information is limited to information in (1) the Contract Documents and (2) the Technical Data.

E. No other Site-related documents are available.

5.04 ~~*Site Visit and Testing by Bidders*~~

~~A. Bidder is required to visit the Site and conduct a thorough visual examination of the Site and adjacent areas. During the visit the Bidder must not disturb any ongoing operations at the Site.~~

~~B. A Site visit is scheduled following the pre-bid conference. Maps to the Site will be available at the pre-Bid conference.~~

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C. A Site visit is scheduled for **[designate, date, time and location]**. Maps to the Site will be made available upon request.

D. Bidders visiting the Site are required to arrange their own transportation to the Site.

E. All access to the Site other than during a regularly scheduled Site visit must be coordinated through the following Owner or Engineer contact for visiting the Site: **[provide contact information]**. Bidder must conduct the required Site visit during normal working hours.

F. Bidder is not required to conduct any subsurface testing, or exhaustive investigations of Site conditions.

G. On request, and to the extent Owner has control over the Site, and schedule permitting, the Owner will provide Bidder general access to the Site to conduct such additional examinations, investigations, explorations, tests, and studies as Bidder deems necessary for preparing and submitting a successful Bid. Owner will not have any obligation to grant such access if doing so is not practical because of existing operations, security or safety concerns, or restraints on Owner's authority regarding the Site. Bidder is responsible for establishing access needed to reach specific selected test sites.

H. Bidder must comply with all applicable Laws and Regulations regarding excavation and location of utilities, obtain all permits, and comply with all terms and conditions established by Owner or by property owners or other entities controlling the Site with respect to schedule, access, existing operations, security, liability insurance, and applicable safety programs.

I. Bidder must fill all holes and clean up and restore the Site to its former condition upon completion of such explorations, investigations, tests, and studies.

5.05 *Owner's Safety Program*

A. Site visits and work at the Site may be governed by an Owner safety program. If an Owner safety program exists, it will be noted in the Supplementary Conditions.

5.06 *Other Work at the Site*

A. Reference is made to Article 8 of the Supplementary Conditions for the identification of the general nature of other work of which Owner is aware (if any) that is to be performed at the Site by Owner or others (such as utilities and other prime contractors) and relates to the Work contemplated by these Bidding Documents. If Owner is party to a written contract for such other work, then on request, Owner will provide to each Bidder access to examine such contracts (other than portions thereof related to price and other confidential matters), if any.

ARTICLE 6—BIDDER'S REPRESENTATIONS AND CERTIFICATIONS

6.01 *Express Representations and Certifications in Bid Form, Agreement*

A. The Bid Form that each Bidder will submit contains express representations regarding the Bidder's examination of Project documentation, Site visit, and preparation of the Bid, and certifications regarding lack of collusion or fraud in connection with the Bid. Bidder should review these representations and certifications, and assure that Bidder can make the representations and certifications in good faith, before executing and submitting its Bid.

B. If Bidder is awarded the Contract, Bidder (as Contractor) will make similar express representations and certifications when it executes the Agreement.

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ARTICLE 7—INTERPRETATIONS AND ADDENDA

7.01 Owner on its own initiative may issue Addenda to clarify, correct, supplement, or change the Bidding Documents.

7.02 Bidder shall submit all questions about the meaning or intent of the Bidding Documents to Engineer in writing. Contact information and submittal procedures for such questions are as follows:

A. **Jed Hastings: Email: Jed.Hastings@interstateeng.com Phone: 701-252-0234**

7.03 Interpretations or clarifications considered necessary by Engineer in response to such questions will be issued by Addenda delivered to all registered plan holders. Questions received less than seven days prior to the date for opening of Bids may not be answered.

7.04 Only responses set forth in an Addendum will be binding. Oral and other interpretations or clarifications will be without legal effect. Responses to questions are not part of the Contract Documents unless set forth in an Addendum that expressly modifies or supplements the Contract Documents.

ARTICLE 8—BID SECURITY

8.01 A Bid must be accompanied by Bid security made payable to Owner in an amount of **5** percent of Bidder's maximum Bid price (determined by adding the base bid and all alternates) and in the form of a Bid bond issued by a surety meeting the requirements of Paragraph 6.01 of the General Conditions. Such Bid bond will be issued in the form included in the Bidding Documents. Bid security must be at least 5% of the Bidder's maximum Bid price.

8.02 The Bid security of the apparent Successful Bidder will be retained until Owner awards the contract to such Bidder, and such Bidder has executed the Contract, furnished the required Contract security, and met the other conditions of the Notice of Award, whereupon the Bid security will be released. If the Successful Bidder fails to execute and deliver the Contract and furnish the required Contract security within 15 days after the Notice of Award, Owner may consider Bidder to be in default, annul the Notice of Award, and the Bid security of that Bidder will be forfeited, in whole in the case of a penal sum bid bond, and to the extent of Owner's damages in the case of a damages-form bond. Such forfeiture will be Owner's exclusive remedy if Bidder defaults.

8.03 The Bid security of other Bidders that Owner believes to have a reasonable chance of receiving the award may be retained by Owner until the earlier of 7 days after the Effective Date of the Contract or 61 days after the Bid opening, whereupon Bid security furnished by such Bidders will be released.

8.04 Bid security of other Bidders that Owner believes do not have a reasonable chance of receiving the award will be released within 7 days after the Bid opening.

ARTICLE 9—CONTRACT TIMES

9.01 The number of days within which, or the dates by which, the Work is to be (a) substantially completed and (b) ready for final payment, and (c) Milestones (if any) are to be achieved, are set forth in the Agreement.

9.02 Deleted

9.03 Provisions for liquidated damages, if any, for failure to timely attain a Milestone, Substantial Completion, or completion of the Work in readiness for final payment, are set forth in the Agreement.

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ARTICLE 10—SUBSTITUTE AND "OR EQUAL" ITEMS

10.01 Deleted

10.02 The Contract for the Work, as awarded, will be on the basis of materials and equipment specified or described in the Bidding Documents, and those "or-equal" or substitute or materials and equipment subsequently approved by Engineer prior to the submittal of Bids and identified by Addendum. No item of material or equipment will be considered by Engineer as an "or-equal" or substitute unless written request for approval has been submitted by Bidder and has been received by Engineer within 10 days of the issuance of the Advertisement for Bids or invitation to Bidders. Each such request must comply with the requirements of Paragraphs 7.05 and 7.06 of the General Conditions, and the review of the request will be governed by the principles in those paragraphs. Each such request shall include the Manufacturers' Certificate for Compliance with Domestic Preference requirements. Refer to the suggested Manufacturer's Certification provided in these construction Contract Documents. The burden of proof of the merit of the proposed item is upon Bidder. Engineer's decision of approval or disapproval of a proposed item will be final. If Engineer approves any such proposed item, such approval will be set forth in an Addendum issued to all registered Bidders. Bidders cannot rely upon approvals made in any other manner. Substitues and "or-equal" materials and equipment may be proposed by Contractor in accordance with Paragraphs 7.05 and 7.06 of the General Conditions after the Effective Date of the Contract. Each such request shall include Manufacturer's Certification letter to document compliance with Domestic Preference requirements. Refer to Manufacturer's Certification Letter provided in these Contract Documents.

10.03 All prices that Bidder sets forth in its Bid will be based on the presumption that the Contractor will furnish the materials and equipment specified or described in the Bidding Documents, as supplemented by Addenda. Any assumptions regarding the possibility of post-Bid approvals of "or-equal" or substitution requests are made at Bidder's sole risk.

ARTICLE 11—SUBCONTRACTORS, SUPPLIERS, AND OTHERS

11.01 Deleted

11.02 The apparent Successful Bidder, and any other Bidder so requested, must submit to Owner a list of the Subcontractors or Suppliers proposed for the following portions of the Work within five days after Bid opening:

A. **Concrete Pavement**

B. **Seeding**

C. **Pavement Replacement**

D. **Traffic Control**

E. **Aggregate Base Course**

F. **Bedding Gravel**

G. **Concrete**

H. **Asphalt Mix**

I. **Geotechnical Testing**

11.03 If requested by Owner, such list must be accompanied by an experience statement with pertinent information regarding similar projects and other evidence of qualification for each such Subcontractor or Supplier. If Owner or Engineer, after due investigation, has reasonable objection to any proposed

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Subcontractor or Supplier, Owner may, before the Notice of Award is given, request apparent Successful Bidder to submit an acceptable substitute, in which case apparent Successful Bidder will submit a substitute, Bidder's Bid price will be increased (or decreased) by the difference in cost occasioned by such substitution, and Owner may consider such price adjustment in evaluating Bids and making the Contract award.

11.04 If apparent Successful Bidder declines to make any such substitution, Owner may award the Contract to the next lowest Bidder that proposes to use acceptable Subcontractors and Suppliers. Declining to make requested substitutions will constitute grounds for forfeiture of the Bid security of any Bidder. Any Subcontractor or Supplier, so listed and against which Owner or Engineer makes no written objection prior to the giving of the Notice of Award will be deemed acceptable to Owner and Engineer subject to subsequent revocation of such acceptance as provided in Paragraph 7.07 of the General Conditions.

11.05 The Contractor shall not award work to Subcontractor(s) in excess of the limits stated in SC 707A

ARTICLE 12—PREPARATION OF BID

12.01 The Bid Form is included with the Bidding Documents.

A. All blanks on the Bid Form must be completed in ink and the Bid Form signed in ink. Erasures or alterations must be initialed in ink by the person signing the Bid Form. A Bid price must be indicated for each section, Bid item, alternate, adjustment unit price item, and unit price item listed therein.

B. If the Bid Form expressly indicates that submitting pricing on a specific alternate item is optional, and Bidder elects to not furnish pricing for such optional alternate item, then Bidder may enter the words "No Bid" or "Not Applicable."

12.02 If Bidder has obtained the Bidding Documents as Electronic Documents, then Bidder shall prepare its Bid on a paper copy of the Bid Form printed from the Electronic Documents version of the Bidding Documents. The printed copy of the Bid Form must be clearly legible, printed on 8½ inch by 11-inch paper and as closely identical in appearance to the Electronic Document version of the Bid Form as may be practical. The Owner reserves the right to accept Bid Forms which nominally vary in appearance from the original paper version of the Bid Form, providing that all required information and submittals are included with the Bid.

12.03 A Bid by a corporation must be executed in the corporate name by a corporate officer (whose title must appear under the signature), accompanied by evidence of authority to sign. The corporate address and state of incorporation must be shown.

12.04 A Bid by a partnership must be executed in the partnership name and signed by a partner (whose title must appear under the signature), accompanied by evidence of authority to sign. The official address of the partnership must be shown.

12.05 A Bid by a limited liability company must be executed in the name of the firm by a member or other authorized person and accompanied by evidence of authority to sign. The state of formation of the firm and the official address of the firm must be shown.

12.06 A Bid by an individual must show the Bidder's name and official address.

12.07 A Bid by a joint venture must be executed by an authorized representative of each joint venturer in the manner indicated on the Bid Form. The joint venture must have been formally established prior to submittal of a Bid, and the official address of the joint venture must be shown.

12.08 All names must be printed in ink below the signatures.

12.09 The Bid must contain an acknowledgment of receipt of all Addenda, the numbers of which must be filled in on the Bid Form.

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12.10 Postal and e-mail addresses and telephone number for communications regarding the Bid must be shown.

12.11 The Bid must contain evidence of Bidder's authority to do business in the state where the Project is located, or Bidder must certify in writing that it will obtain such authority within the time for acceptance of Bids and attach such certification to the Bid.

12.12 If Bidder is required to be licensed to submit a Bid or perform the Work in the state where the Project is located, the Bid must contain evidence of Bidder's licensure, or Bidder must certify in writing that it will obtain such licensure within the time for acceptance of Bids and attach such certification to the Bid. Bidder's state contractor license number, if any, must also be shown on the Bid Form.

ARTICLE 13—BASIS OF BID

13.01 *Lump Sum*

A. Bidders must submit a Bid on a lump sum basis as set forth in the Bid Form.

13.02 *Deleted*

13.03 *Deleted*

13.04 *Deleted*

13.05 *Unit Price*

A. Bidders must submit a Bid on a unit price basis for each item of Work listed in the unit price section of the Bid Form.

B. The "Bid Price" (sometimes referred to as the extended price) for each unit price Bid item will be the product of the "Estimated Quantity", which Owner or its representative has set forth in the Bid Form, for the item and the corresponding "Bid Unit Price" offered by the Bidder. The total of all unit price Bid items will be the sum of these "Bid Prices"; such total will be used by Owner for Bid comparison purposes. The final quantities and Contract Price will be determined in accordance with Paragraph 13.03 of the General Conditions.

C. Discrepancies between the multiplication of units of Work and unit prices will be resolved in favor of the unit prices. Discrepancies between the indicated sum of any column of figures and the correct sum thereof will be resolved in favor of the correct sum.

13.06 *Allowances*

A. For cash allowances the Bid price must include such amounts as the Bidder deems proper for Contractor's overhead, costs, profit, and other expenses on account of cash allowances, if any, named in the Contract Documents, in accordance with Paragraph 13.02.B of the General Conditions.

13.07 *Deleted*

ARTICLE 14—SUBMITTAL OF BID

14.01 The Bidding Documents include one separate unbound copy of the Bid Form, and, if required, the Bid Bond Form. The unbound copy of the Bid Form is to be completed and submitted with the Bid security and the other documents required to be submitted under the terms of Article 2 of the Bid Form.

14.02 A Bid must be received no later than the date and time prescribed and at the place indicated in the Advertisement or invitation to bid and must be enclosed in a plainly marked package with the Project title, and, if applicable, the designated portion of the Project for which the Bid is submitted, the name and address of Bidder, and must be accompanied by the Bid security and other required documents. If a Bid is

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sent by mail or other delivery system, the sealed envelope containing the Bid must be enclosed in a separate package plainly marked on the outside with the notation "BID ENCLOSED." A mailed Bid must be addressed to the location designated in the Advertisement.

14.03 Bids received after the date and time prescribed for the opening of bids, or not submitted at the correct location or in the designated manner, will not be accepted and will be returned to the Bidder unopened.

ARTICLE 15—MODIFICATION AND WITHDRAWAL OF BID

15.01 An unopened Bid may be withdrawn by an appropriate document duly executed in the same manner that a Bid must be executed and delivered to the place where Bids are to be submitted prior to the date and time for the opening of Bids. Upon receipt of such notice, the unopened Bid will be returned to the Bidder.

15.02 If a Bidder wishes to modify its Bid prior to Bid opening, Bidder must withdraw its initial Bid in the manner specified in Paragraph 15.01 and submit a new Bid prior to the date and time for the opening of Bids.

15.03 Deleted

ARTICLE 16—OPENING OF BIDS

16.01 Bids will be opened at the time and place indicated in the advertisement or invitation to bid and, unless obviously non-responsive, read aloud publicly. An abstract of the amounts of the base Bids and major alternates, if any, will be made available to Bidders after the opening of Bids.

16.02 Deleted

ARTICLE 17—BIDS TO REMAIN SUBJECT TO ACCEPTANCE

17.01 All Bids will remain subject to acceptance for the period of time stated in the Bid Form, but Owner may, in its sole discretion, release any Bid and return the Bid security prior to the end of this period.

ARTICLE 18—EVALUATION OF BIDS AND AWARD OF CONTRACT

18.01 Owner reserves the right to reject any or all Bids, including without limitation, nonconforming, nonresponsive, unbalanced, or conditional Bids. Owner also reserves the right to waive all minor Bid informalities not involving price, time, or changes in the Work.

18.02 Owner will reject the Bid of any Bidder that Owner finds, after reasonable inquiry and evaluation, to not be responsible.

18.03 If Bidder purports to add terms or conditions to its Bid, takes exception to any provision of the Bidding Documents, or attempts to alter the contents of the Contract Documents for purposes of the Bid, whether in the Bid itself or in a separate communication to Owner or Engineer, then Owner will reject the Bid as nonresponsive.

18.04 If Owner awards the contract for the Work, such award will be to the responsible Bidder submitting the lowest responsive Bid.

18.05 *Evaluation of Bids*

A. In evaluating Bids, Owner will consider whether the Bids comply with the prescribed requirements, and such alternates, unit prices, and other data, as may be requested in the Bid Form or prior to the Notice of Award.

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B. In the comparison of Bids, alternates will be applied in the same order of priority as listed in the Bid Form. To determine the Bid prices for purposes of comparison, Owner will announce to all bidders a "Base Bid plus alternates" budget after receiving all Bids, but prior to opening them. For comparison purposes alternates will be accepted, following the order of priority established in the Bid Form, until doing so would cause the budget to be exceeded. After determination of the Successful Bidder based on this comparative process and on the responsiveness, responsibility, and other factors set forth in these Instructions, the award may be made to said Successful Bidder on its base Bid and any combination of its additive alternate Bids for which Owner determines funds will be available at the time of award.

C. For determination of the apparent low Bidder(s) when sectional bids are submitted, Bids will be compared on the basis of the aggregate of the Bids for separate sections and the Bids for combined sections that result in the lowest total amount for all of the Work.

D. For the determination of the apparent low Bidder when unit price bids are submitted, Bids will be compared on the basis of the total of the products of the estimated quantity of each item and unit price Bid for that item, together with any lump sum items.

E. Deleted

F. Deleted

18.06 In evaluating whether a Bidder is responsible, Owner will consider the qualifications of the Bidder and may consider the qualifications and experience of Subcontractors and Suppliers proposed for those portions of the Work for which the identity of Subcontractors and Suppliers must be submitted as provided in the Bidding Documents.

18.07 Owner may conduct such investigations as Owner deems necessary to establish the responsibility, qualifications, and financial ability of Bidders and any proposed Subcontractors or Suppliers.

ARTICLE 19—BONDS AND INSURANCE

19.01 Article 6 of the General Conditions, as may be modified by the Supplementary Conditions, sets forth Owner's requirements as to performance and payment bonds, other required bonds (if any), and insurance. When the Successful Bidder delivers the executed Agreement to Owner, it must be accompanied by required bonds and insurance documentation.

19.02 Article 8, Bid Security, of these Instructions, addresses any requirements for providing bid bonds as part of the bidding process.

ARTICLE 20—SIGNING OF AGREEMENT

20.01 When Owner issues a Notice of Award to the Successful Bidder, it will be accompanied by the unexecuted counterparts of the Agreement along with the other Contract Documents as identified in the Agreement. Within 15 days thereafter, Successful Bidder must execute and deliver the required number of counterparts of the Agreement and any bonds and insurance documentation required to be delivered by the Contract Documents to Owner. Within 10 days thereafter, Owner will deliver one fully executed counterpart of the

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Agreement to Successful Bidder, together with printed and electronic copies of the Contract Documents as stated in Paragraph 2.02 of the General Conditions.

ARTICLE 21—FEDERAL REQUIREMENTS

21.01 IF THE CONTRACT PRICE IS IN EXCESS OF $100,000, PROVISIONS OF THE Contract Work Hours and Safety Standards Act at 29 CFR 5.5(b) apply.

21.02 Federal requirements at Article 19 of the Supplementary Conditions apply to this Contract.

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BID FORM FOR CONSTRUCTION CONTRACT

The terms used in this Bid with initial capital letters have the meanings stated in the Instructions to Bidders, the General Conditions, and the Supplementary Conditions.

ARTICLE 1—OWNER AND BIDDER

1.01 This Bid is submitted to: **City of Jamestown, 102 Third Avenue SE, Jamestown, North Dakota 58401**

1.02 The undersigned Bidder proposes and agrees, if this Bid is accepted, to enter into an Agreement with Owner in the form included in the Bidding Documents to perform all Work as specified or indicated in the Bidding Documents for the prices and within the times indicated in this Bid and in accordance with the other terms and conditions of the Bidding Documents.

ARTICLE 2—ATTACHMENTS TO THIS BID

2.01 The following documents are submitted with and made a condition of this Bid:

A. Required Bid security;

B. List of Proposed Subcontractors;

C. List of Proposed Suppliers;

D. Evidence of authority to do business in the state of the Project; or a written covenant to obtain such authority within the time for acceptance of Bids;

E. Contractor's license number as evidence of Bidder's State Contractor's License or a covenant by Bidder to obtain said license within the time for acceptance of Bids;

F. Required Bidder Qualification Statement with supporting data;

G. **If Bid amount exceeds $10,000, signed Compliance Statement (RD 400-6). Refer to specific equal opportunity requirements set forth in the Supplementary Conditions of the Construction Contract (EJCDC C-800);**

H. **If Bid amount exceeds $25,000, signed Certification Regarding Debarment Suspension, Ineligibility and Voluntary Exclusion – Lower Tier Covered Transactions (AD – 1048);**

I. **If Bid amount exceeds $100,000, signed RD Instruction 1940-Q Exhibit A-1, Certification for Contracts, Grants, and Loans.**

J. **[List other documents and edit above as pertinent]**

ARTICLE 3—BASIS OF BID—LUMP SUM BID AND UNIT PRICES

1. *Deleted*

2. Deleted

3. Deleted

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3.02 *Unit Price Bids*

A. Bidder will perform the following Work at the indicated unit prices:

Item No.	Description	Unit	Estimated Quantity	Bid Unit Price	Bid Amount
1	96" Storm Sewer Pipe – Fiberglass Reinforced Polymer (FRP)	LF	910		$
2	22.5° Bend - FRP	EA	1		$
3	45° Bend - FRP	EA	3		$
4	60° Bend - FRP	EA	1		$
5	96" Storm Sewer Tee – FRP w/ Riser and Manhole Casting and Cover	EA	1		$
6	Wall Sleeve - FRP	EA	2		$
7	15 Inch Polyvinyl Chloride Storm Sewer Pipe	LF	45		$
8	Cast in Place Concrete Structure	EA	1		$
9	Replace (Quantity) Inlet – Type 2 – Double	EA	3		$
10	Reconnect Existing Storm Sewer Service	EA	3		$
11	Removal of Concrete Pavement	SY	690		$
12	Curb and Gutter Removal	LF	795		$
13	Curb and Gutter Replacement - Type I	LF	710		$
14	Curb and Gutter Mountable - Type I	LF	85		$
15	Removal of Asphalt Pavement	SY	1,270		$
16	Pavement Replacement - Asphalt Section 1	SY	1,270		$
17	Pavement Replacement - Concrete Section 2	SY	690		$
18	Flowable Fill	CY	390		$
19	Seeding Class I	Acre	.6		$
20	General Requirements and Mobilization	LS	1		$
21	Testing - Allowance	LS	1	$10,000.00	$10,000.00
22	Traffic Control	LS	1		$
23	Removal of Existing 96" Storm Sewer Pipe	LS	1		$
24	Clearing Outlet Channel	LS	1		$
25	Temporary Access	LS	1		$
Total of All Unit Price Bid Items					$

B. Bidder acknowledges that:

1. each Bid Unit Price includes an amount considered by Bidder to be adequate to cover Contractor's overhead and profit for each separately identified item, and

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2. estimated quantities are not guaranteed, and are solely for the purpose of comparison of Bids, and final payment for all Unit Price Work will be based on actual quantities, determined as provided in the Contract Documents.

3.03 *Total Bid Price (Lump Sum and Unit Prices)*

Total Bid Price (Total of all Lump Sum and Unit Price Bids)	$

ARTICLE 4—DELETED

ARTICLE 5—DELETED

ARTICLE 6—TIME OF COMPLETION

6.01 Bidder agrees that the Work will be substantially complete and will be completed and ready for final payment in accordance with Paragraph 15.06 of the General Conditions on or before the dates or within the number of days indicated in the Agreement.

6.02 Deleted

6.03 Deleted

6.04 Bidder accepts the provisions of the Agreement as to liquidated damages.

ARTICLE 7—BIDDER'S ACKNOWLEDGEMENTS: ACCEPTANCE PERIOD, INSTRUCTIONS, AND RECEIPT OF ADDENDA

7.01 *Bid Acceptance Period*

A. This Bid will remain subject to acceptance for 60 days after the Bid opening, or for such longer period of time that Bidder may agree to in writing upon request of Owner.

7.02 *Instructions to Bidders*

A. Bidder accepts all of the terms and conditions of the Instructions to Bidders, including without limitation those dealing with the disposition of Bid security.

7.03 *Receipt of Addenda*

A. Bidder hereby acknowledges receipt of the following Addenda: **[Add rows as needed. Bidder is to complete table.]**

Addendum Number	Addendum Date

ARTICLE 8—BIDDER'S REPRESENTATIONS AND CERTIFICATIONS

8.01 *Bidder's Representations*

A. In submitting this Bid, Bidder represents the following:

1. Bidder has examined and carefully studied the Bidding Documents, including Addenda.

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2. Bidder has visited the Site, conducted a thorough visual examination of the Site and adjacent areas, and become familiar with the general, local, and Site conditions that may affect cost, progress, and performance of the Work.
3. Bidder is familiar with all Laws and Regulations that may affect cost, progress, and performance of the Work , including all Domestic Preference requirements.
4. Bidder has carefully studied the reports of explorations and tests of subsurface conditions at or adjacent to the Site and the drawings of physical conditions relating to existing surface or subsurface structures at the Site that have been identified in the Supplementary Conditions, with respect to the Technical Data in such reports and drawings.
5. Bidder has carefully studied the reports and drawings relating to Hazardous Environmental Conditions, if any, at or adjacent to the Site that have been identified in the Supplementary Conditions, with respect to Technical Data in such reports and drawings.
6. Bidder has considered the information known to Bidder itself; information commonly known to contractors doing business in the locality of the Site; information and observations obtained from visits to the Site; the Bidding Documents; and the Technical Data identified in the Supplementary Conditions or by definition, with respect to the effect of such information, observations, and Technical Data on (a) the cost, progress, and performance of the Work; (b) the means, methods, techniques, sequences, and procedures of construction to be employed by Bidder, if selected as Contractor; and (c) Bidder's (Contractor's) safety precautions and programs.
7. Based on the information and observations referred to in the preceding paragraph, Bidder agrees that no 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.
8. Bidder 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 Bidding Documents.
9. Bidder has given Engineer written notice of all conflicts, errors, ambiguities, or discrepancies that Bidder has discovered in the Bidding Documents, and of discrepancies between Site conditions and the Contract Documents, and the written resolution thereof by Engineer is acceptable to Contractor.
10. The Bidding Documents are generally sufficient to indicate and convey understanding of all terms and conditions for performance and furnishing of the Work.
11. The submission of this Bid constitutes an incontrovertible representation by Bidder that without exception the Bid and all prices in the Bid are premised upon performing and furnishing the Work required by the Bidding Documents.

8.02 *Bidder's Certifications*

A. The Bidder certifies the following:

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1. This Bid is genuine and not made in the interest of or on behalf of any undisclosed individual or entity and is not submitted in conformity with any collusive agreement or rules of any group, association, organization, or corporation.
2. Bidder has not directly or indirectly induced or solicited any other Bidder to submit a false or sham Bid.
3. Bidder has not solicited or induced any individual or entity to refrain from bidding.
4. Bidder has not engaged in corrupt, fraudulent, collusive, or coercive practices in competing for the Contract. For the purposes of this Paragraph 8.02.A:
    a. Corrupt practice means the offering, giving, receiving, or soliciting of anything of value likely to influence the action of a public official in the bidding process.
    b. Fraudulent practice means an intentional misrepresentation of facts made (a) to influence the bidding process to the detriment of Owner, (b) to establish bid prices at artificial non-competitive levels, or (c) to deprive Owner of the benefits of free and open competition.
    c. 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.
    d. 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.

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BIDDER hereby submits this Bid as set forth above:

Bidder:

_____
(typed or printed name of organization)

By: _____
(individual's signature)

Name: _____
(typed or printed)

Title: _____
(typed or printed)

Date: _____
(typed or printed)

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

Attest: _____
(individual's signature)

Name: _____
(typed or printed)

Title: _____
(typed or printed)

Date: _____
(typed or printed)

Address for giving notices:

_____

_____

Bidder's Contact:

Name: _____
(typed or printed)

Title: _____
(typed or printed)

Phone: _____

Email: _____

Address:

_____

_____

_____

Bidder's Contractor License No.: (if applicable) _____

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PART 1 GENERAL

00.1.01 DESCRIPTION

A. The EJCDC C-510 Notice of Award (1 Page) as included herein will be used by Owner to notify the recipient that it is the Successful Bidder (as defined in the General Conditions) and is awarded the Contract. The Notice of Award also provides instructions on signing and returning the Agreement, furnishing required bonds and insurance documentation, and receiving copies of the Contract Documents.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

NOTICE OF AWARD

Date of Issuance:

Owner:	CITY OF JAMESTOWN	Owner's Project No.:	EC23-00-100.01
Engineer:		Engineer's Project No.:	EC23-00-100.01

Project:

Contract Name:

Bidder:

Bidder's Address:

You are notified that Owner has accepted your Bid dated **[date]** for the above Contract, and that you are the Successful Bidder and are awarded a Contract for:

[Describe Work, alternates, or sections of Work awarded]

The Contract Price of the awarded Contract is $**[Contract Price]**. Contract Price is subject to adjustment based on the provisions of the Contract, including but not limited to those governing changes, Unit Price Work, and Work performed on a cost-plus-fee basis, as applicable.

[Number of copies sent] unexecuted counterparts of the Agreement accompany this Notice of Award, and one copy of the Contract Documents accompanies this Notice of Award, or has been transmitted or made available to Bidder electronically.

☐ Drawings will be delivered separately from the other Contract Documents.

You must comply with the following conditions precedent within 15 days of the date of receipt of this Notice of Award:

1. Deliver to Owner **[number of copies sent]** counterparts of the Agreement, signed by Bidder (as Contractor).
2. Deliver with the signed Agreement(s) the Contract security (such as required performance and payment bonds) and insurance documentation, as specified in the Instructions to Bidders and in the General Conditions, Articles 2 and 6.
3. Other conditions precedent (if any): **[Describe other conditions that require Successful Bidder's compliance]**

Failure to comply with these conditions within the time specified will entitle Owner to consider you in default, annul this Notice of Award, and declare your Bid security forfeited.

Within 10 days after you comply with the above conditions, Owner will return to you one fully signed counterpart of the Agreement, together with any additional copies of the Contract Documents as indicated in Paragraph 2.02 of the General Conditions.

Owner: **CITY OF JAMESTOWN**

By *(signature)*: _____

Name *(printed)*: _____

Title: _____

Copy: Engineer

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PART 1 GENERAL

00.1.01 DESCRIPTION

A. The EJCDC C-520 Agreement between Owner and Contractor for Construction Contract (Stipulated Price) (9 Pages) as included herein will be used by Owner and Contractor to formalize the contract which identifies specific lump sums and unit prices as Contractor's compensation for performing the Work.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

PAGE LEFT BLANK INTENTIONALLY

AGREEMENT BETWEEN OWNER AND CONTRACTOR FOR CONSTRUCTION CONTRACT (STIPULATED PRICE)

This Agreement is by and between **City of Jamestown** ("Owner") and **[name of contracting entity]** ("Contractor").

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

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: **Total removal of 800 Feet of 96" CMP and replacement of 910 Feet with 96" Fiberglass reinforced pipe (FRP) connecting between existing storm sewer with surface restoration.**

ARTICLE 2—THE PROJECT

2.01 The Project, of which the Work under the Contract Documents is a part, is generally described as follows: **96" Stormwater Replacement-Phase 2 Segment II**

ARTICLE 3—ENGINEER

3.01 The Owner has retained **Interstate Engineering** ("Engineer") to act as Owner's representative, assume all duties and responsibilities of Engineer, and have the rights and authority assigned to Engineer in the Contract.

3.02 The part of the Project that pertains to the Work has been designed by **Interstate Engineering.**

ARTICLE 4—CONTRACT TIMES

4.01 *Time is 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 *Contract Times: Dates*

A. The Work will be substantially complete on or before **November 21, 2026**, and completed and ready for final payment in accordance with Paragraph 15.06 of the General Conditions on or before **December 21, 2026.**

4.03 Deleted

4.04 Deleted

4.05 *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 and other losses if the Work is not completed and Milestones not achieved within the Contract Times, as duly modified. The parties also recognize the delays, expense, and difficulties involved in proving, in a legal or arbitration

EJCDC® C-520, Agreement between Owner and Contractor for Construction Contract (Stipulated Price).
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proceeding, 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):

1. *Substantial Completion:* Contractor shall pay Owner $**2,000.00** for each day that expires after the time (as duly adjusted pursuant to the Contract) specified above for Substantial Completion, until the Work is substantially complete.
2. Deleted
3. Deleted
4. Liquidated damages for failing to timely attain Milestones, Substantial Completion, and final completion are not additive, and will not be imposed concurrently.

B. If Owner recovers liquidated damages for a delay in completion by Contractor, then such liquidated damages are Owner's sole and exclusive remedy for such delay, and Owner is precluded from recovering any other damages, whether actual, direct, excess, or consequential, for such delay, except for special damages (if any) specified in this Agreement.

C. *Deleted*

ARTICLE 5—CONTRACT PRICE

5.01 Owner shall pay Contractor for completion of the Work in accordance with the Contract Documents, the amounts that follow, subject to adjustment under the Contract:

A. For all Unit Price Work, an amount equal to the sum of the extended prices (established for each separately identified item of Unit Price Work by multiplying the unit price times the actual quantity of that item). The extended prices for Unit Price Work set forth as of the Effective Date of the Contract are based on estimated quantities. As provided in Paragraph 13.03 of the General Conditions, estimated quantities are not guaranteed, and determinations of actual quantities and classifications are to be made by Engineer.

B. For all Work, at the prices stated in Contractor's Bid, attached hereto as an exhibit.

ARTICLE 6—PAYMENT PROCEDURES

6.01 *Submittal and Processing of Payments*

A. Contractor shall submit Applications for Payment in accordance with Article 15 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 the basis of Contractor's Applications for Payment once each month during performance of the Work as provided in Paragraph 6.02.A.1 below, provided that such Applications for Payment have been submitted in a timely manner and otherwise meet the requirements of the Contract. All such payments will be measured by the Schedule of Values established as provided in 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 elsewhere in the Contract.

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

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previously made and less such amounts as Owner may withhold, including but not limited to liquidated damages, in accordance with the Contract.

a. **95** percent of the value of the Work completed (with the balance being retainage).

(1) Deleted

b. **95** percent of cost of materials and equipment not incorporated in the Work (with the balance being retainage).

B. Upon Substantial Completion and at Owner's discretion, the amount of retainage may be reduced if requested by Contractor of the entire construction to be provided under the construction Contract Documents.

6.03 *Final Payment*

A. Upon final completion and acceptance of the Work, Owner shall pay the remainder of the Contract Price in accordance with Paragraph 15.06 of the General Conditions.

6.04 *Consent of Surety*

A. Owner will not make final payment, or return or release retainage at Substantial Completion or any other time, unless Contractor submits written consent of the surety to such payment, return, or release.

6.05 *Interest*

A. All amounts not paid when due will bear interest at the maximum rate allowed by law at the place of the Project.

ARTICLE 7—CONTRACT DOCUMENTS

7.01 *Contents*

A. The Contract Documents consist of all of the following:

1. This Agreement.
2. Bonds:
    a. Performance bond (together with power of attorney).
    b. Payment bond (together with power of attorney).
3. General Conditions.
4. Supplementary Conditions.
5. Specifications as listed in the table of contents of the project manual.
6. Drawings (not attached but incorporated by reference) consisting of **[number]** sheets with each sheet bearing the following general title: **[title on Drawings]**.
7. Addenda (numbers **[number]** to **[number]**, inclusive).
8. Exhibits to this Agreement (enumerated as follows):
    a. Notice of Award.
    b. Acknowledgement of Principal.
    c. Bid Forms.

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d. Acknowledgement of Liquidated Damages.

e. Contractor's License.

f. Current Workmen's Compensation Certificate of Premium Paid.

g. Contractor's Tax Clearance Statement from the State of the Project.

h. Contractor's Certificate of Liability Insurance.

i. Contractor's Insurance Checklist.

j. Construction Equipment Form.

k. **[Funding Agency Documents]**

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

a. Notice to Proceed.

b. Work Change Directives.

c. Change Orders.

d. Field Orders.

e. Warranty Bond, if any.

B. The Contract Documents listed in Paragraph 7.01.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 7.

D. The Contract Documents may only be amended, modified, or supplemented as provided in the Contract.

ARTICLE 8—REPRESENTATIONS, CERTIFICATIONS, AND STIPULATIONS

8.01 *Contractor's Representations*

A. In order to induce Owner to enter into this Contract, Contractor makes the following representations:

1. Contractor has examined and carefully studied the Contract Documents, including Addenda.

2. Contractor has visited the Site, conducted a thorough visual examination of the Site and adjacent areas, and become familiar with the general, local, and Site conditions that may affect cost, progress, and performance of the Work.

3. Contractor is familiar with all Laws and Regulations that may affect cost, progress, and performance of the Work.

4. Contractor has carefully studied the reports of explorations and tests of subsurface conditions at or adjacent to the Site and the drawings of physical conditions relating to existing surface or subsurface structures at the Site that have been identified in the Supplementary Conditions, with respect to the Technical Data in such reports and drawings.

5. Contractor has carefully studied the reports and drawings relating to Hazardous Environmental Conditions, if any, at or adjacent to the Site that have been identified in

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the Supplementary Conditions, with respect to Technical Data in such reports and drawings.

6. Contractor has considered the information known to Contractor itself; information commonly known to contractors doing business in the locality of the Site; information and observations obtained from visits to the Site; the Contract Documents; and the Technical Data identified in the Supplementary Conditions or by definition, with respect to the effect of such information, observations, and Technical Data on (a) the cost, progress, and performance of the Work; (b) the means, methods, techniques, sequences, and procedures of construction to be employed by Contractor; and (c) Contractor's safety precautions and programs.

7. Based on the information and observations referred to in the preceding paragraph, Contractor agrees that no 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.

8. 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.

9. Contractor has given Engineer written notice of all conflicts, errors, ambiguities, or discrepancies that Contractor has discovered in the Contract Documents, and of discrepancies between Site conditions and the Contract Documents, and the written resolution thereof by Engineer is acceptable to Contractor.

10. The Contract Documents are generally sufficient to indicate and convey understanding of all terms and conditions for performance and furnishing of the Work.

11. Contractor's entry into this Contract constitutes an incontrovertible representation by Contractor that without exception all prices in the Agreement are premised upon performing and furnishing the Work required by the Contract Documents.

8.02 *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 8.02:

1. "corrupt practice" means the offering, giving, receiving, or soliciting of anything 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.

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8.03 *Standard General Conditions*

A. Owner stipulates that if the General Conditions that are made a part of this Contract are EJCDC® C-700, Standard General Conditions for the Construction Contract (2018), published by the Engineers Joint Contract Documents Committee, and if Owner is the party that has furnished said General Conditions, then Owner has plainly shown all modifications to the standard wording of such published document to the Contractor, through a process such as highlighting or "track changes" (redline/strikeout), or in the Supplementary Conditions.

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IN WITNESS WHEREOF, Owner and Contractor have signed this Agreement.

This Agreement will be effective on **[indicate date on which Contract becomes effective]** (which is the Effective Date of the Contract).

Owner:

CITY OF JAMESTOWN
(typed or printed name of organization)

By: _____
(individual's signature)

Date: _____
(date signed)

Name: _____
(typed or printed)

Title: _____
(typed or printed)

Attest: _____
(individual's signature)

Title: _____
(typed or printed)

Address for giving notices:

Designated Representative:

Name: _____
(typed or printed)

Title: _____
(typed or printed)

Address:

Phone: _____

Email: _____

(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.)

Contractor:

_____
(typed or printed name of organization)

By: _____
(individual's signature)

Date: _____
(date signed)

Name: _____
(typed or printed)

Title: _____
(typed or printed)

*(If **[Type of Entity]** is a corporation, a partnership, or a joint venture, attach evidence of authority to sign.)*

Attest: _____
(individual's signature)

Title: _____
(typed or printed)

Address for giving notices:

Designated Representative:

Name: _____
(typed or printed)

Title: _____
(typed or printed)

Address:

Phone: _____

Email: _____

License No.: _____
(where applicable)

State: _____

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PART 1 GENERAL

00.1.01 DESCRIPTION

A. The EJCDC C-550 Notice to Proceed (1 Page) as included herein will be used by Owner to notify the Contractor that it may proceed with construction as of a specified date. The Notice to Proceed also provides a statement of required completion date(s).

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

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NOTICE TO PROCEED

Owner:	CITY OF JAMESTOWN	Owner's Project No.:	EC23-00-100.01
Engineer:		Engineer's Project No.:	EC23-00-100.01
Contractor:		Contractor's Project No.:	EC23-00-100.01
Project:			
Contract Name:			
Effective Date of Contract:			

Owner hereby notifies Contractor that the Contract Times under the above Contract will commence to run on **[date Contract Times are to start]** pursuant to Paragraph 4.01 of the General Conditions.

On that date, Contractor shall start performing its obligations under the Contract Documents. No Work will be done at the Site prior to such date.

In accordance with the Agreement: **[Select one of the following two alternatives, insert dates or number of days, and delete the other alternative.]**

The date by which Substantial Completion must be achieved is **[date for Substantial Completion, from Agreement]**, and the date by which readiness for final payment must be achieved is **[date for readiness, from Agreement]**.

[or]

The number of days to achieve Substantial Completion is **[number of days, from Agreement]** from the date stated above for the commencement of the Contract Times, resulting in a date for Substantial Completion of **[date, calculated from commencement date above]**; and the number of days to achieve readiness for final payment is **[number of days, from Agreement]** from the commencement date of the Contract Times, resulting in a date for readiness for final payment of **[date, calculated from commencement date above]**.

Before starting any Work at the Site, Contractor must comply with the following:

[Note any access limitations, security procedures, or other restrictions]

Owner:	**CITY OF JAMESTOWN**
By *(signature)*:	
Name *(printed)*:	
Title:	
Date Issued:	

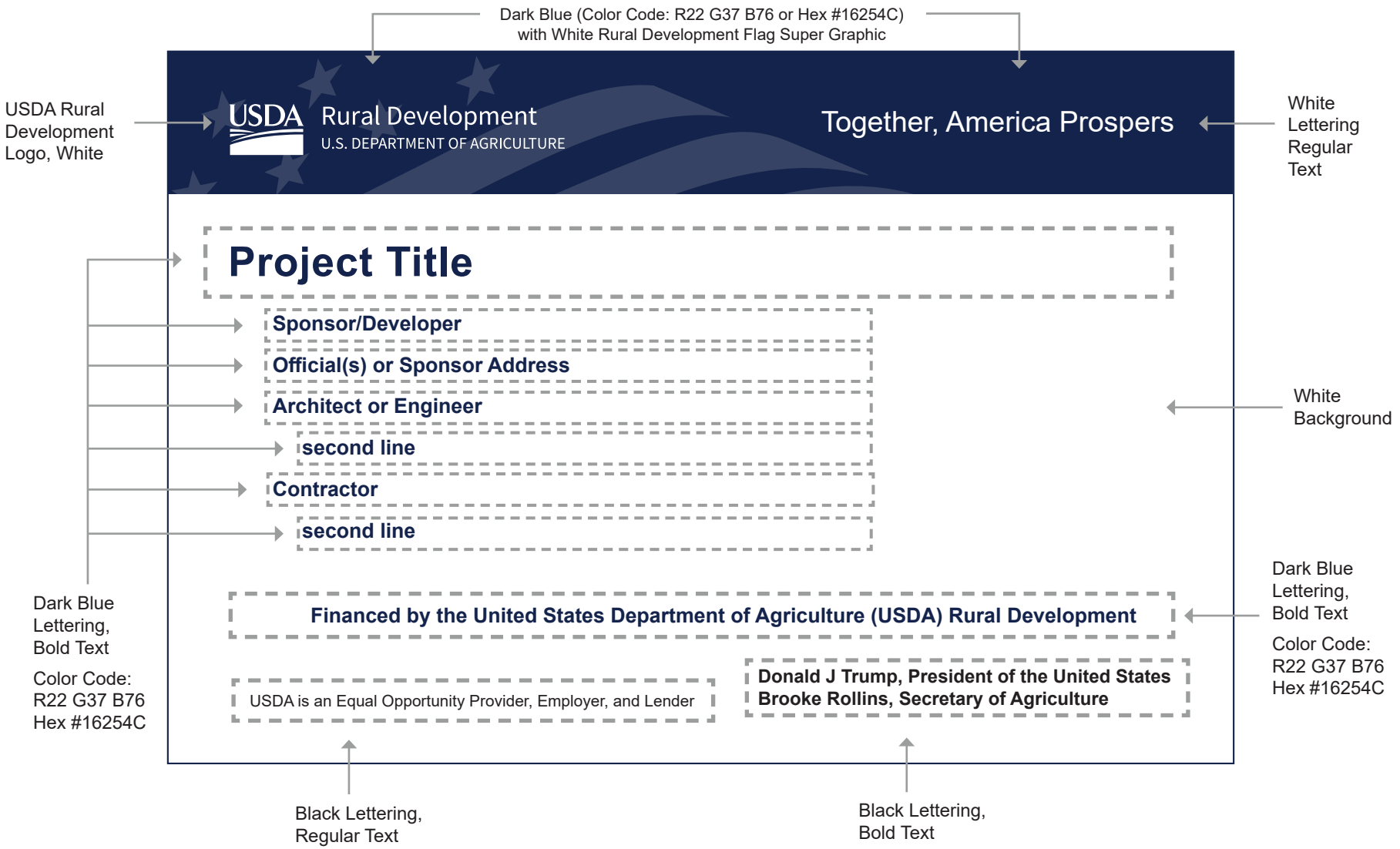
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Temporary Construction Sign for Rural Development Projects

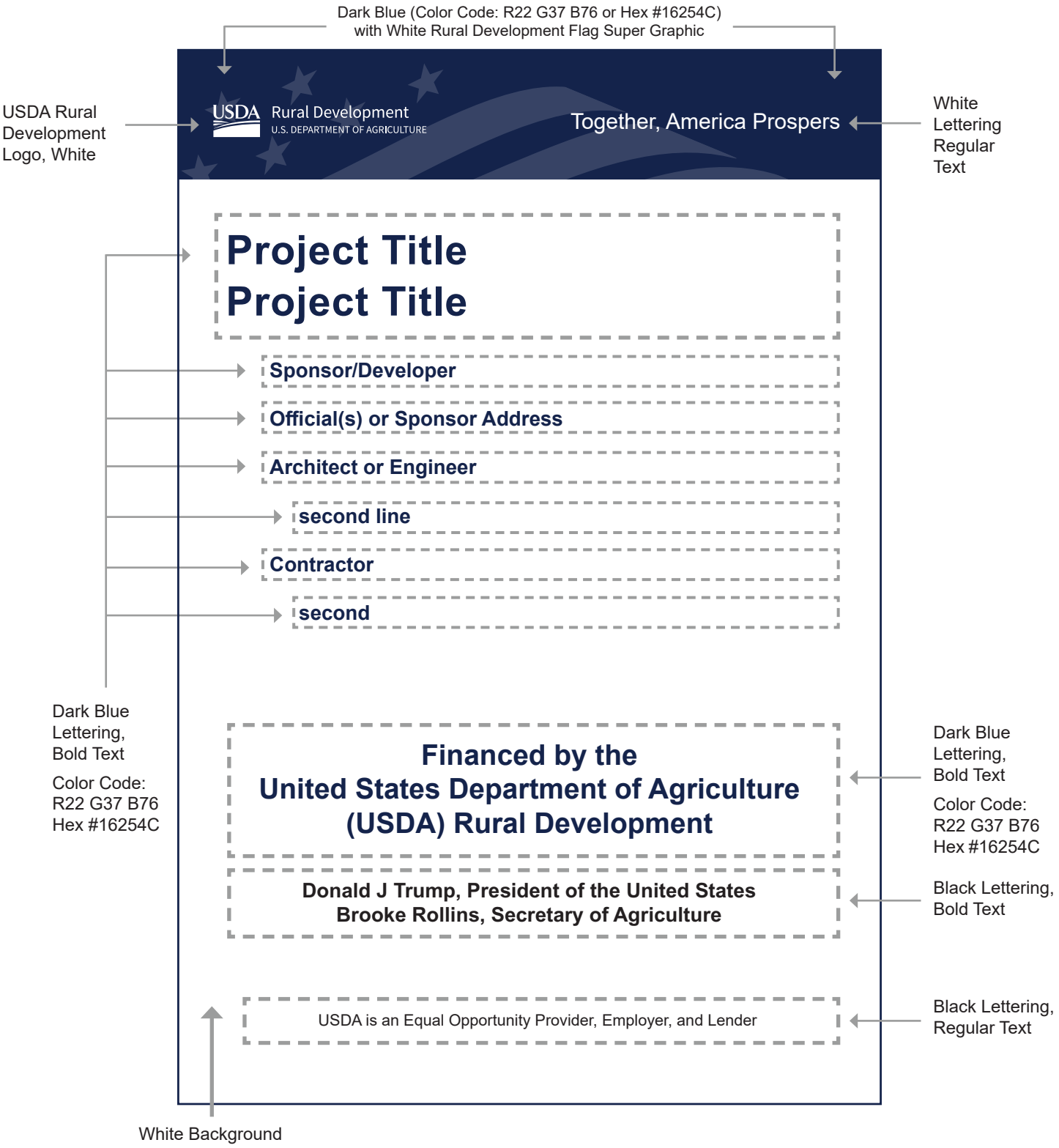
Recommended Font: Arial



SIGN DIMENSIONS: 1200mm x 2400mm x 19mm (approx.4’ x 8’ x 3/4)
PLYWOOD PANEL (APA RATED A+B GRADE-EXTERIOR)

Temporary Construction Sign for Rural Development Projects

Recommended Font: Arial



SIGN DIMENSIONS: 2400mm x 1200mm x 19mm (approx.8'x 4' x 3/4")
PLYWOOD PANEL (APA RATED A+B GRADE-EXTERIOR)

BID BOND (PENAL SUM FORM)

Bidder	**Surety**
Name: **[Full formal name of Bidder]** Address *(principal place of business)*: **[Address of Bidder's principal place of business]**	Name: **[Full formal name of Surety]** Address *(principal place of business)*: **[Address of Surety's principal place of business]**
Owner	**Bid**
Name: **[Full formal name of Owner]** Address *(principal place of business)*: **[Address of Owner's principal place of business]**	Project *(name and location)*: **[Owner project/contract name, and location of the project]** Bid Due Date: **[Enter date bid is due]**
Bond Penal Sum: **[Amount]** Date of Bond: **[Date]**	

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

Bidder	Surety
_____ *(Full formal name of Bidder)*	_____ *(Full formal name of Surety) (corporate seal)*
By: _____ *(Signature)*	By: _____ *(Signature) (Attach Power of Attorney)*
Name: _____ *(Printed or typed)*	Name: _____ *(Printed or typed)*
Title: _____	Title: _____
Attest: _____ *(Signature)*	Attest: _____ *(Signature)*
Name: _____ *(Printed or typed)*	Name: _____ *(Printed or typed)*
Title:	Title:

Notes: (1) Note: Addresses are to be used for giving any required notice. (2) Provide execution by any additional parties, such as joint venturers, if necessary.

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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 will be Owner's sole and exclusive remedy upon default of Bidder.
2. Default of Bidder occurs 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 will 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 does not in the aggregate exceed 120 days from the Bid due date without Surety's written consent.
6. No suit or action will 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 the Bid due date.
7. Any suit or action under this Bond will be commenced only in a court of competent jurisdiction located in the state in which the Project is located.
8. Notices required hereunder must 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 Postal Service registered or certified mail, return receipt requested, postage pre-paid, and will 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 will 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 governs and the remainder of this Bond that is not in conflict therewith continues in full force and effect.
11. The term "Bid" as used herein includes a Bid, offer, or proposal as applicable.

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ARTICLE 1—GENERAL INFORMATION

1.01 Provide contact information for the Business:

Legal Name of Business:			
Corporate Office			
Name:		Phone number:	
Title:		Email address:	
Business address of corporate office:			
Local Office			
Name:		Phone number:	
Title:		Email address:	
Business address of local office:			

1.02 Provide information on the Business's organizational structure:

Form of Business:	☐ Sole Proprietorship ☐ Partnership ☐ Corporation		
☐ Limited Liability Company ☐ Joint Venture comprised of the following companies:			
	1.		
	2.		
	3.		
Provide a separate Qualification Statement for each Joint Venturer.			
Date Business was formed:		State in which Business was formed:	
Is this Business authorized to operate in the Project location?		☐ Yes ☐ No ☐ Pending	

1.03 Identify all businesses that own Business in whole or in part (25% or greater), or that are wholly or partly (25% or greater) owned by Business:

Name of business:		Affiliation:	
Address:			
Name of business:		Affiliation:	
Address:			
Name of business:		Affiliation:	
Address:			

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1.04 Provide information regarding the Business's officers, partners, and limits of authority.

Name:		Title:	
Authorized to sign contracts: ☐ Yes ☐ No		Limit of Authority:	$
Name:		Title:	
Authorized to sign contracts: ☐ Yes ☐ No		Limit of Authority:	$
Name:		Title:	
Authorized to sign contracts: ☐ Yes ☐ No		Limit of Authority:	$
Name:		Title:	

ARTICLE 2—LICENSING

2.01 Provide information regarding licensure for Business:

Name of License:			
Licensing Agency:			
License No:		Expiration Date:	
Name of License:			
Licensing Agency:			
License No:		Expiration Date:	

ARTICLE 3—DIVERSE BUSINESS CERTIFICATIONS

3.01 Provide information regarding Business's Diverse Business Certification, if any. Provide evidence of current certification.

Certification	Certifying Agency	Certification Date
☐ Disadvantaged Business Enterprise		
☐ Minority Business Enterprise		
☐ Woman-Owned Business Enterprise		
☐ Small Business Enterprise		
☐ Disabled Business Enterprise		
☐ Veteran-Owned Business Enterprise		
☐ Service-Disabled Veteran-Owned Business		
☐ HUBZone Business (Historically Underutilized) Business		
☐ Other		
☐ None		

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ARTICLE 4—SAFETY

4.01 Provide information regarding Business's safety organization and safety performance.

Name of Business's Safety Officer:		
Safety Certifications		
Certification Name	Issuing Agency	Expiration

4.02 Provide Worker's Compensation Insurance Experience Modification Rate (EMR), Total Recordable Frequency Rate (TRFR) for incidents, and Total Number of Recorded Manhours (MH) for the last 3 years and the EMR, TRFR, and MH history for the last 3 years of any proposed Subcontractor(s) that will provide Work valued at 10% or more of the Contract Price. Provide documentation of the EMR history for Business and Subcontractor(s).

Year									
Company	EMR	TRFR	MH	EMR	TRFR	MH	EMR	TRFR	MH

ARTICLE 5—FINANCIAL

5.01 Provide information regarding the Business's financial stability. Provide the most recent audited financial statement, and if such audited financial statement is not current, also provide the most current financial statement.

Financial Institution:		
Business address:		
Date of Business's most recent financial statement:		☐ Attached
Date of Business's most recent audited financial statement:		☐ Attached
Financial indicators from the most recent financial statement		
Contractor's Current Ratio (Current Assets ÷ Current Liabilities)		
Contractor's Quick Ratio ((Cash and Cash Equivalents + Accounts Receivable + Short Term Investments) ÷ Current Liabilities)		

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ARTICLE 6—SURETY INFORMATION

6.01 Provide information regarding the surety company that will issue required bonds on behalf of the Business, including but not limited to performance and payment bonds.

Surety Name:			
Surety is a corporation organized and existing under the laws of the state of:			
Is surety authorized to provide surety bonds in the Project location?	☐ Yes ☐ No		
Is surety listed in "Companies Holding Certificates of Authority as Acceptable Sureties on Federal Bonds and as Acceptable Reinsuring Companies" published in Department Circular 570 (as amended) by the Bureau of the Fiscal Service, U.S. Department of the Treasury? ☐ Yes ☐ No			
Mailing Address (principal place of business):			
Physical Address (principal place of business):			
Phone (main):		Phone (claims):	

ARTICLE 7—INSURANCE

7.01 Provide information regarding Business's insurance company(s), including but not limited to its Commercial General Liability carrier. Provide information for each provider.

Name of insurance provider, and type of policy (CLE, auto, etc.):			
Insurance Provider		Type of Policy (Coverage Provided)	
Are providers licensed or authorized to issue policies in the Project location?		☐ Yes ☐ No	
Does provider have an A.M. Best Rating of A-VII or better?		☐ Yes ☐ No	
Mailing Address (principal place of business):			
Physical Address (principal place of business):			
Phone (main):		Phone (claims):	

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ARTICLE 8—CONSTRUCTION EXPERIENCE

8.01 Provide information that will identify the overall size and capacity of the Business.

Average number of current full-time employees:	
Estimate of revenue for the current year:	
Estimate of revenue for the previous year:	

8.02 Provide information regarding the Business's previous contracting experience.

Years of experience with projects like the proposed project:				
As a general contractor:		As a joint venturer:		
Has Business, or a predecessor in interest, or an affiliate identified in Paragraph 1.03:				
Been disqualified as a bidder by any local, state, or federal agency within the last 5 years? ☐ Yes ☐ No				
Been barred from contracting by any local, state, or federal agency within the last 5 years? ☐ Yes ☐ No				
Been released from a bid in the past 5 years? ☐ Yes ☐ No				
Defaulted on a project or failed to complete any contract awarded to it? ☐ Yes ☐ No				
Refused to construct or refused to provide materials defined in the contract documents or in a change order? ☐ Yes ☐ No				
Been a party to any currently pending litigation or arbitration? ☐ Yes ☐ No				
Provide full details in a separate attachment if the response to any of these questions is Yes.				

8.03 List all projects currently under contract in Schedule A and provide indicated information.

8.04 List a minimum of three and a maximum of six projects completed in the last 5 years in Schedule B and provide indicated information to demonstrate the Business's experience with projects similar in type and cost of construction.

8.05 In Schedule C, provide information on key individuals whom Business intends to assign to the Project. Provide resumes for those individuals included in Schedule C. Key individuals include the Project Manager, Project Superintendent, Quality Manager, and Safety Manager. Resumes may be provided for Business's key leaders as well.

ARTICLE 9—REQUIRED ATTACHMENTS

9.01 Provide the following information with the Statement of Qualifications:

A. If Business is a Joint Venture, separate Qualifications Statements for each Joint Venturer, as required in Paragraph 1.02.

B. Diverse Business Certifications if required by Paragraph 3.01.

C. Certification of Business's safety performance if required by Paragraph 4.02.

D. Financial statements as required by Paragraph 5.01.

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E. Attachments providing additional information as required by Paragraph 8.02.

F. Schedule A (Current Projects) as required by Paragraph 8.03.

G. Schedule B (Previous Experience with Similar Projects) as required by Paragraph 8.04.

H. Schedule C (Key Individuals) and resumes for the key individuals listed, as required by Paragraph 8.05.

I. Additional items as pertinent.

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This Statement of Qualifications is offered by:

Business: _____
(typed or printed name of organization)

By: _____
(individual's signature)

Name: _____
(typed or printed)

Title: _____
(typed or printed)

Date: _____
(date signed)

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

Attest: _____
(individual's signature)

Name: _____
(typed or printed)

Title: _____
(typed or printed)

Address for giving notices:

_____

_____

_____

Designated Representative:

Name: _____
(typed or printed)

Title: _____
(typed or printed)

Address:

_____

_____

_____

Phone: _____

Email: _____

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Schedule A—Current Projects

Name of Organization				
Project Owner		Project Name		
General Description of Project				
Project Cost		Date Project		
Key Project Personnel	Project Manager	Project Superintendent	Safety Manager	Quality Control Manager
Name				

Reference Contact Information (listing names indicates approval to contacting the names individuals as a reference)

	Name	Title/Position	Organization	Telephone	Email
Owner					
Designer					
Construction Manager					

Project Owner		Project Name		
General Description of Project				
Project Cost		Date Project		
Key Project Personnel	Project Manager	Project Superintendent	Safety Manager	Quality Control Manager
Name				

Reference Contact Information (listing names indicates approval to contacting the names individuals as a reference)

	Name	Title/Position	Organization	Telephone	Email
Owner					
Designer					
Construction Manager					

Project Owner		Project Name		
General Description of Project				
Project Cost		Date Project		
Key Project Personnel	Project Manager	Project Superintendent	Safety Manager	Quality Control Manager
Name				

Reference Contact Information (listing names indicates approval to contacting the names individuals as a reference)

	Name	Title/Position	Organization	Telephone	Email
Owner					
Designer					
Construction Manager					

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Schedule B—Previous Experience with Similar Projects

Name of Organization				
Project Owner		Project Name		
General Description of Project				
Project Cost		Date Project		
Key Project Personnel	Project Manager	Project Superintendent	Safety Manager	Quality Control Manager
Name				

Reference Contact Information (listing names indicates approval to contacting the names individuals as a reference)					
	Name	Title/Position	Organization	Telephone	Email
Owner					
Designer					
Construction Manager					

Project Owner		Project Name		
General Description of Project				
Project Cost		Date Project		
Key Project Personnel	Project Manager	Project Superintendent	Safety Manager	Quality Control Manager
Name				

Reference Contact Information (listing names indicates approval to contacting the names individuals as a reference)					
	Name	Title/Position	Organization	Telephone	Email
Owner					
Designer					
Construction Manager					

Project Owner		Project Name		
General Description of Project				
Project Cost		Date Project		
Key Project Personnel	Project Manager	Project Superintendent	Safety Manager	Quality Control Manager
Name				

Reference Contact Information (listing names indicates approval to contacting the names individuals as a reference)					
	Name	Title/Position	Organization	Telephone	Email
Owner					
Designer					
Construction Manager					

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Schedule B—Previous Experience with Similar Projects

Name of Organization				
Project Owner		Project Name		
General Description of Project				
Project Cost		Date Project		
Key Project Personnel	Project Manager	Project Superintendent	Safety Manager	Quality Control Manager
Name				

Reference Contact Information (listing names indicates approval to contacting the names individuals as a reference)

	Name	Title/Position	Organization	Telephone	Email
Owner					
Designer					
Construction Manager					

Project Owner		Project Name		
General Description of Project				
Project Cost		Date Project		
Key Project Personnel	Project Manager	Project Superintendent	Safety Manager	Quality Control Manager
Name				

Reference Contact Information (listing names indicates approval to contacting the names individuals as a reference)

	Name	Title/Position	Organization	Telephone	Email
Owner					
Designer					
Construction Manager					

Project Owner		Project Name		
General Description of Project				
Project Cost		Date Project		
Key Project Personnel	Project Manager	Project Superintendent	Safety Manager	Quality Control Manager
Name				

Reference Contact Information (listing names indicates approval to contacting the names individuals as a reference)

	Name	Title/Position	Organization	Telephone	Email
Owner					
Designer					
Construction Manager					

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Schedule C—Key Individuals

Project Manager			
Name of individual			
Years of experience as project manager			
Years of experience with this organization			
Number of similar projects as project manager			
Number of similar projects in other positions			
Current Project Assignments			
Name of assignment		Percent of time used for this project	Estimated project completion date
Reference Contact Information (listing names indicates approval to contact named individuals as a reference)			
Name		Name	
Title/Position		Title/Position	
Organization		Organization	
Telephone		Telephone	
Email		Email	
Project		Project	
Candidate's role on project		Candidate's role on project	
Project Superintendent			
Name of individual			
Years of experience as project superintendent			
Years of experience with this organization			
Number of similar projects as project superintendent			
Number of similar projects in other positions			
Current Project Assignments			
Name of assignment		Percent of time used for this project	Estimated project completion date
Reference Contact Information (listing names indicates approval to contact named individuals as a reference)			
Name		Name	
Title/Position		Title/Position	
Organization		Organization	
Telephone		Telephone	
Email		Email	
Project		Project	
Candidate's role on project		Candidate's role on project	

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Safety Manager			
Name of individual			
Years of experience as project manager			
Years of experience with this organization			
Number of similar projects as project manager			
Number of similar projects in other positions			
Current Project Assignments			
Name of assignment		Percent of time used for this project	Estimated project completion date
Reference Contact Information (listing names indicates approval to contact named individuals as a reference)			
Name		Name	
Title/Position		Title/Position	
Organization		Organization	
Telephone		Telephone	
Email		Email	
Project		Project	
Candidate's role on project		Candidate's role on project	

Quality Control Manager			
Name of individual			
Years of experience as project superintendent			
Years of experience with this organization			
Number of similar projects as project superintendent			
Number of similar projects in other positions			
Current Project Assignments			
Name of assignment		Percent of time used for this project	Estimated project completion date
Reference Contact Information (listing names indicates approval to contact named individuals as a reference)			
Name		Name	
Title/Position		Title/Position	
Organization		Organization	
Telephone		Telephone	
Email		Email	
Project		Project	
Candidate's role on project		Candidate's role on project	

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USDA
Form RD 400-6
(Rev. 4-00)

Form Approved
OMB No. 0575-0018

COMPLIANCE STATEMENT

This statement relates to a proposed contract with _____

_____,
(Name of borrower or grantee)

who expects to finance the contract with assistance from either the Rural Housing Service (RHS), Rural Business-Cooperative Service (RBS), or the Rural Utilities Service (RUS) or their successor agencies, United States Department of Agriculture (whether by a loan, grant, loan insurance, guarantee, or other form of financial assistance).I am the undersigned bidder or prospective contractor, I represent that:

1. I ☐ have, ☐ have not, participated in a previous contract or subcontract subject to Executive 11246 (regarding equal employment opportunity) or a preceding similar Executive Order.

2. If I have participated in such a contract or subcontract, I ☐ have, ☐ have not, filed all compliance reports that have been required to file in connection with the contract or subcontract.

If the proposed contract is for $50,000 or more and I have 50 or more employees, I also represent that:

3. I ☐ have, ☐ have not previsouly had contracts subject to the written affirmative action programs requirements of the Secretary of Labor.

4. If I have participated in such a contract or subcontract, I ☐ have, ☐ have not developed and placed on file at each establishment affirmative action programs as required by the rules and regulations of the Secretary of Labor.

I understand that if I have failed to file any compliance reports that have been required of me, I am not eligible and will not be eligible to have my bid considered or to enter into the proposed contract unless and until I make an arrangement regarding such reports that is satisfactory to either the RHS, RBS or RUS, or to the office where the reports are required to be filed.

I also certify that I do not maintain or provide for my employees any segregated facilities at any of my establishments, and that I do not permit my employees to perform their services at any location, under my control, where segregated facilities are maintained. I certify further that I will not maintain or provide for my employees any segregated facilities at any of my establishments, and that I will not permit my employees to perform their services at any location, under my control, where segregated facilities are maintained. I agree that a breach of this certification is a violation of the Equal Opportunity clause in my contract. As used in this certification, the term "segregated facilities" means any waiting rooms, work areas, restrooms and wash rooms, restaurants and other eating areas time clocks, locker rooms and other storage or dressing areas, parking lots, drinking fountains, recreation or entertainment areas, transportation, and housing facilities provided for employees which are segregated by explicit directive or are in fact segregated on the basis of race, creed, color, or national origin, because of habit, local custom, or otherwise. I further agree that (except where I have obtained identical certifications for proposed subcontractors for specific time periods) I will obtain identical certifications from proposed subcontractors prior to the award of subcontracts exceeding $10,000 which are not exempt from the provisions of the Equal Opportunity clause; that I will retain such certifications in my files; and that I will forward the following notice to such proposed subcontractors (except where the proposed subcontractors have submitted identical certifications for specific time periods): (See Reverse).

According to the Paperwork Reduction Act of 1995, an agency may not conduct or sponsor, and a person is not required to respond to a collection of information unless it displays a valid OMB control number. The valid OMB control number for this information collection is 0575-0018. The time required to complete this information collection is estimated to average 10 minutes per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information.

NOTICE TO PROSPECTIVE SUBCONTRACTORS OF REQUIREMENTS FOR CERTIFICATIONS OF NON-SEGREGATED FACILITIES

A certification of Nonsegregated Facilities, as required by the May 9, 1967, order (32F.R. 7439, May 19, 1967) on Elimination of Segregated Facilities, by the Secretary of Labor, must be submitted prior to the award of a subcontract exceeding $10,000 which is not exempt from the provisions of the Equal Opportunity clause. The certification may be submitted either for each subcontract or for all subcontracts during a period (i.e. quarterly, semiannually, or annually).

NOTE: The penalty for making false statements in offers is prescribed in 18 U.S.C. 1001.

DATE _____ _____

(Signature of Bidder or Prospective Contractor)

_____

Address (including Zip Code)

U.S. DEPARTMENT OF AGRICULTURE

Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion - Lower Tier Covered Transactions

This certification is required by the regulations implementing Executive Order 12549, Debarment and Suspension, 7 CFR part 3017, Section 3017.510, Participants' responsibilities. The regulations were published as Part IV of the January 30, 1989, Federal Register (pages 4722-4733). Copies of the regulations may be obtained by contacting the Department of Agriculture agency with which this transaction originated.

(BEFORE COMPLETING CERTIFICATION, READ INSTRUCTIONS ON REVERSE)

(1) The prospective lower tier participant certifies, by submission of this proposal, that neither it nor its principals is presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from participation in this transaction by any Federal department or agency.

(2) Where the prospective lower tier participant is unable to certify to any of the statements in this certification, such prospective participant shall attach an explanation to this proposal.

Organization Name | PR/Award Number or Project Name

Name(s) and Title(s) of Authorized Representative(s)

Signature(s) | Date

Instructions for Certification

1. By signing and submitting this form, the prospective lower tier participant is providing the certification set out on the reverse side in accordance with these instructions.

2. The certification in this clause is a material representation of fact upon which reliance was placed when this transaction was entered into. If it is later determined that the prospective lower tier participant knowingly rendered an erroneous certification, in addition to other remedies available to the Federal Government, the department or agency with which this transaction originated may pursue available remedies, including suspension and/or debarment.

3. The prospective lower tier participant shall provide immediate written notice to the person to which this proposal is submitted if at any time the prospective lower tier participant learns that its certification was erroneous when submitted or has become erroneous by reason of changed circumstances.

4. The terms "covered transaction," "debarred," "suspended," "ineligible," "lower tier covered transaction," "participant," "person," "primary covered transaction," "principal," "proposal," and "voluntarily excluded," as used in this clause, have the meanings set out in the Definitions and Coverage sections of rules implementing Executive Order 12549. You may contact the person to which this proposal is submitted for assistance in obtaining a copy of those regulations.

5. The prospective lower tier participant agrees by submitting this form that, should the proposed covered transaction be entered into, it shall not knowingly enter into any lower tier covered transaction with a person who is debarred, suspended, declared ineligible, or voluntarily excluded from participation in this covered transaction, unless authorized by the department or agency with which this transaction originated.

6. The prospective lower tier participant further agrees by submitting this form that it will include this clause titled "Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion - Lower Tier Covered Transaction," without modification, in all lower tier covered transaction and in all solicitations for lower tier covered transactions.

7. A participant in a covered transaction may rely upon a certification of a prospective participant in a lower tier covered transaction that is not debarred, suspended, ineligible, or voluntarily excluded from the covered transaction, unless it knows that the certification is erroneous. A participant may decide the method and frequency by which it determines the eligibility of its principals. Each participant may, but is not required to, check the Nonprocurement List.

8. Nothing contained in the foregoing shall be construed to require establishment of a system of records in order to render in good faith the certification required by this clause. The knowledge and information of a participant is not required to exceed that which is normally possessed by a prudent person in the ordinary course of business dealings.

9. Except for transactions authorized under paragraph 5 of these instructions, if a participant in a covered transaction knowingly enters into a lower tier covered transaction with a person who is suspended, debarred, ineligible, or voluntarily excluded from participation in this transaction, in addition to other remedies available to the Federal Government, the department or agency with which this transaction originated may pursue available remedies, including suspension and/or debarment.

CERTIFICATION FOR CONTRACTS, GRANTS AND LOANS

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

1. 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 any 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 or Federal loan, and the extension, continuation, renewal, amendment, or modification of any Federal contract, grant or loan.

2. 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 or loan, the undersigned shall complete and submit Standard Form - LLL, "Disclosure of Lobbying Activities," in accordance with its instructions.

3. The undersigned shall require that the language of this certification be included in the award documents for all subawards at all tiers (including contracts, subcontracts, and subgrants under grants and loans) 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.

_____ _____

(name) (date)

_____

(title)

oOo

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PART 1 GENERAL

00.1.01 DESCRIPTION

A. The EJCDC C-610 Performance Bond (4 Pages) included herein must be used by the Contractor and Surety to provide assurances to the Owner regarding the performance and completion of the Contractor's obligations under the construction contract. The Performance Bond establishes the responsibilities of the Surety with regard to a default in performance by the Contractor.

B. The successful bidder shall furnish a performance bond equal to the contract amount.

C. The performance bond will remain in effect until the end of the correction period, as defined in the bid documents.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

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PERFORMANCE BOND

Contractor Name: **[Full formal name of Contractor]** Address *(principal place of business)*: **[Address of Contractor's principal place of business]**	**Surety** Name: **[Full formal name of Surety]** Address *(principal place of business)*: **[Address of Surety's principal place of business]**
Owner Name: **[Full formal name of Owner]** Mailing address *(principal place of business)*: **[Address of Owner's principal place of business]**	**Contract** Description *(name and location)*: **[Owner's project/contract name, and location of the project]** Contract Price: **[Amount from Contract]** Effective Date of Contract: **[Date from Contract]**

Bond

Bond Amount: **[Amount]**

Date of Bond: **[Date]**

(Date of Bond cannot be earlier than Effective Date of Contract)

Modifications to this Bond form:

☐ None ☐ See Paragraph 16

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

Contractor as Principal	Surety
_____ *(Full formal name of Contractor)*	_____ *(Full formal name of Surety) (corporate seal)*
By: _____ *(Signature)*	By: _____ *(Signature)(Attach Power of Attorney)*
Name: _____ *(Printed or typed)*	Name: _____ *(Printed or typed)*
Title: _____	Title: _____
Attest: _____ *(Signature)*	Attest: _____ *(Signature)*
Name: _____ *(Printed or typed)*	Name: _____ *(Printed or typed)*
Title: _____	Title: _____

Notes: (1) Provide supplemental execution by any additional parties, such as joint venturers. (2) Any singular reference to Contractor, Surety, Owner, or other party is considered plural where applicable.

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

2. If the Contractor performs the Construction Contract, the Surety and the Contractor shall have no obligation under this Bond, except when applicable to participate in a conference as provided in Paragraph 3.

3. If there is no Owner Default under the Construction Contract, the Surety's obligation under this Bond will arise after:

    3.1. The Owner first provides notice to the Contractor and the Surety that the Owner is considering declaring a Contractor Default. Such notice may indicate whether the Owner is requesting a conference among the Owner, Contractor, and Surety to discuss the Contractor's performance. If the Owner does not request a conference, the Surety may, within five (5) business days after receipt of the Owner's notice, request such a conference. If the Surety timely requests a conference, the Owner shall attend. Unless the Owner agrees otherwise, any conference requested under this Paragraph 3.1 will be held within ten (10) business days of the Surety's receipt of the Owner's notice. If the Owner, the Contractor, and the Surety agree, the Contractor shall be allowed a reasonable time to perform the Construction Contract, but such an agreement does not waive the Owner's right, if any, subsequently to declare a Contractor Default;

    3.2. The Owner declares a Contractor Default, terminates the Construction Contract and notifies the Surety; and

    3.3. The Owner has agreed to pay the Balance of the Contract Price in accordance with the terms of the Construction Contract to the Surety or to a contractor selected to perform the Construction Contract.

4. Failure on the part of the Owner to comply with the notice requirement in Paragraph 3.1 does not constitute a failure to comply with a condition precedent to the Surety's obligations, or release the Surety from its obligations, except to the extent the Surety demonstrates actual prejudice.

5. When the Owner has satisfied the conditions of Paragraph 3, the Surety shall promptly and at the Surety's expense take one of the following actions:

    5.1. Arrange for the Contractor, with the consent of the Owner, to perform and complete the Construction Contract;

    5.2. Undertake to perform and complete the Construction Contract itself, through its agents or independent contractors;

    5.3. Obtain bids or negotiated proposals from qualified contractors acceptable to the Owner for a contract for performance and completion of the Construction Contract, arrange for a contract to be prepared for execution by the Owner and a contractor selected with the Owners concurrence, to be secured with performance and payment bonds executed by a qualified surety equivalent to the bonds issued on the Construction Contract, and pay to the Owner the amount of damages as described in Paragraph 7 in excess of the Balance of the Contract Price incurred by the Owner as a result of the Contractor Default; or

    5.4. Waive its right to perform and complete, arrange for completion, or obtain a new contractor, and with reasonable promptness under the circumstances:

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5.4.1 After investigation, determine the amount for which it may be liable to the Owner and, as soon as practicable after the amount is determined, make payment to the Owner; or

5.4.2 Deny liability in whole or in part and notify the Owner, citing the reasons for denial.

6. If the Surety does not proceed as provided in Paragraph 5 with reasonable promptness, the Surety shall be deemed to be in default on this Bond seven days after receipt of an additional written notice from the Owner to the Surety demanding that the Surety perform its obligations under this Bond, and the Owner shall be entitled to enforce any remedy available to the Owner. If the Surety proceeds as provided in Paragraph 5.4, and the Owner refuses the payment, or the Surety has denied liability, in whole or in part, without further notice, the Owner shall be entitled to enforce any remedy available to the Owner.

7. If the Surety elects to act under Paragraph 5.1, 5.2, or 5.3, then the responsibilities of the Surety to the Owner will not be greater than those of the Contractor under the Construction Contract, and the responsibilities of the Owner to the Surety will not be greater than those of the Owner under the Construction Contract. Subject to the commitment by the Owner to pay the Balance of the Contract Price, the Surety is obligated, without duplication for:

   7.1. the responsibilities of the Contractor for correction of defective work and completion of the Construction Contract;

   7.2. additional legal, design professional, and delay costs resulting from the Contractor's Default, and resulting from the actions or failure to act of the Surety under Paragraph 5; and

   7.3. liquidated damages, or if no liquidated damages are specified in the Construction Contract, actual damages caused by delayed performance or non-performance of the Contractor.

8. If the Surety elects to act under Paragraph 5.1, 5.3, or 5.4, the Surety's liability is limited to the amount of this Bond.

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

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

11. Any proceeding, legal or equitable, under this Bond must be instituted in any court of competent jurisdiction in the location in which the work or part of the work is located and must be instituted within two years after a declaration of Contractor Default or within two years after the Contractor ceased working or within two years after the 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 periods of limitations available to sureties as a defense in the jurisdiction of the suit will be applicable.

12. Notice to the Surety, the Owner, or the Contractor must be mailed or delivered to the address shown on the page on which their signature appears.

13. When this Bond has been furnished to comply with a statutory or other legal requirement in the location where the construction was to be performed, any provision in this Bond conflicting with said statutory or legal requirement will be deemed deleted therefrom and provisions conforming to

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such statutory or other legal requirement will be deemed incorporated herein. When so furnished, the intent is that this Bond will be construed as a statutory bond and not as a common law bond.

14. Definitions

    14.1. *Balance of the Contract Price*—The total amount payable by the Owner to the Contractor under the Construction Contract after all proper adjustments have been made including allowance for the Contractor for any amounts received or to be received by the Owner in settlement of insurance or other claims for damages to which the Contractor is entitled, reduced by all valid and proper payments made to or on behalf of the Contractor under the Construction Contract.

    14.2. *Construction Contract*—The agreement between the Owner and Contractor identified on the cover page, including all Contract Documents and changes made to the agreement and the Contract Documents.

    14.3. *Contractor Default*—Failure of the Contractor, which has not been remedied or waived, to perform or otherwise to comply with a material term of the Construction Contract.

    14.4. *Owner Default*—Failure of the Owner, which has not been remedied or waived, to pay the Contractor as required under the Construction Contract or to perform and complete or comply with the other material terms of the Construction Contract.

    14.5. *Contract Documents*—All the documents that comprise the agreement between the Owner and Contractor.

15. If this Bond is issued for an agreement between a contractor and subcontractor, the term Contractor in this Bond will be deemed to be Subcontractor and the term Owner will be deemed to be Contractor.

16. Modifications to this Bond are as follows: **[Describe modification or enter "None"]**

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PART 1 GENERAL

00.1.01 DESCRIPTION

A. The EJCDC C-615 Payment Bond (4 Pages) included herein must be used by the Contractor and Surety to commit to making payment to Subcontractors and Suppliers for labor, materials, and equipment provided to Contractor for the benefit of the Project and Owner. This bond form sets forth the obligations of the Surety to the Owner in the event Contractor fails to pay a Subcontractor or Supplier.

B. The successful bidder shall furnish a payment bond equal to the contract amount.

C. The payment bond will remain in effect until the end of the correction period, as defined in the bid documents.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

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PAYMENT BOND

Contractor	**Surety**
Name: **[Full formal name of Contractor]** Address *(principal place of business)*: **[Address of Contractor's principal place of business]**	Name: **[Full formal name of Surety]** Address *(principal place of business)*: **[Address of Surety's principal place of business]**
Owner	**Contract**
Name: **[Full formal name of Owner]** Mailing address *(principal place of business)*: **[Address of Owner's principal place of business]**	Description *(name and location)*: **[Owner's project/contract name, and location of the project]** Contract Price: **[Amount, from Contract]** Effective Date of Contract: **[Date, from Contract]**

Bond

Bond Amount: **[Amount]**

Date of Bond: **[Date]**

(Date of Bond cannot be earlier than Effective Date of Contract)

Modifications to this Bond form:

☐ None ☐ See Paragraph 18

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

Contractor as Principal	Surety
_____ *(Full formal name of Contractor)*	_____ *(Full formal name of Surety) (corporate seal)*
By: _____ *(Signature)*	By: _____ *(Signature)(Attach Power of Attorney)*
Name: _____ *(Printed or typed)*	Name: _____ *(Printed or typed)*
Title: _____	Title: _____
Attest: _____ *(Signature)*	Attest: _____ *(Signature)*
Name: _____ *(Printed or typed)*	Name: _____ *(Printed or typed)*
Title: _____	Title: _____

Notes: (1) Provide supplemental execution by any additional parties, such as joint venturers. (2) Any singular reference to Contractor, Surety, Owner, or other party is considered plural where applicable.

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1. The Contractor and Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors, and assigns to the Owner to pay for labor, materials, and equipment furnished for use in the performance of the Construction Contract, which is incorporated herein by reference, subject to the following terms.
2. If the Contractor promptly makes payment of all sums due to Claimants, and defends, indemnifies, and holds harmless the Owner from claims, demands, liens, or suits by any person or entity seeking payment for labor, materials, or equipment furnished for use in the performance of the Construction Contract, then the Surety and the Contractor shall have no obligation under this Bond.
3. If there is no Owner Default under the Construction Contract, the Surety's obligation to the Owner under this Bond will arise after the Owner has promptly notified the Contractor and the Surety (at the address described in Paragraph 13) of claims, demands, liens, or suits against the Owner or the Owner's property by any person or entity seeking payment for labor, materials, or equipment furnished for use in the performance of the Construction Contract, and tendered defense of such claims, demands, liens, or suits to the Contractor and the Surety.
4. When the Owner has satisfied the conditions in Paragraph 3, the Surety shall promptly and at the Surety's expense defend, indemnify, and hold harmless the Owner against a duly tendered claim, demand, lien, or suit.
5. The Surety's obligations to a Claimant under this Bond will arise after the following:
    5.1. Claimants who do not have a direct contract with the Contractor
        5.1.1. have furnished a written notice of non-payment to the Contractor, stating with substantial accuracy the amount claimed and the name of the party to whom the materials were, or equipment was, furnished or supplied or for whom the labor was done or performed, within ninety (90) days after having last performed labor or last furnished materials or equipment included in the Claim; and
        5.1.2. have sent a Claim to the Surety (at the address described in Paragraph 13).
    5.2. Claimants who are employed by or have a direct contract with the Contractor have sent a Claim to the Surety (at the address described in Paragraph 13).
6. If a notice of non-payment required by Paragraph 5.1.1 is given by the Owner to the Contractor, that is sufficient to satisfy a Claimant's obligation to furnish a written notice of non-payment under Paragraph 5.1.1.
7. When a Claimant has satisfied the conditions of Paragraph 5.1 or 5.2, whichever is applicable, the Surety shall promptly and at the Surety's expense take the following actions:
    7.1. Send an answer to the Claimant, with a copy to the Owner, within sixty (60) days after receipt of the Claim, stating the amounts that are undisputed and the basis for challenging any amounts that are disputed; and
    7.2. Pay or arrange for payment of any undisputed amounts.
    7.3. The Surety's failure to discharge its obligations under Paragraph 7.1 or 7.2 will not be deemed to constitute a waiver of defenses the Surety or Contractor may have or acquire as to a Claim, except as to undisputed amounts for which the Surety and Claimant have reached agreement. If, however, the Surety fails to discharge its obligations under Paragraph 7.1 or 7.2, the Surety shall indemnify the Claimant for the reasonable attorney's fees the Claimant incurs thereafter to recover any sums found to be due and owing to the Claimant.

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8. The Surety's total obligation will not exceed the amount of this Bond, plus the amount of reasonable attorney's fees provided under Paragraph 7.3, and the amount of this Bond will be credited for any payments made in good faith by the Surety.

9. Amounts owed by the Owner to the Contractor under the Construction Contract will be used for the performance of the Construction Contract and to satisfy claims, if any, under any construction performance bond. By the Contractor furnishing and the Owner accepting this Bond, they agree that all funds earned by the Contractor in the performance of the Construction Contract are dedicated to satisfying obligations of the Contractor and Surety under this Bond, subject to the Owner's priority to use the funds for the completion of the work.

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

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

12. No suit or action will be commenced by a Claimant under this Bond other than in a court of competent jurisdiction in the state in which the project that is the subject of the Construction Contract is located or after the expiration of one year from the date (1) on which the Claimant sent a Claim to the Surety pursuant to Paragraph 5.1.2 or 5.2, 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 Construction 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 will be applicable.

13. Notice and Claims to the Surety, the Owner, or the Contractor must be mailed or delivered to the address shown on the page on which their signature appears. Actual receipt of notice or Claims, however accomplished, will be sufficient compliance as of the date received.

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

15. Upon requests by any person or entity appearing to be a potential beneficiary of this Bond, the Contractor and Owner shall promptly furnish a copy of this Bond or shall permit a copy to be made.

16. Definitions

    16.1. *Claim*—A written statement by the Claimant including at a minimum:

        16.1.1. The name of the Claimant;

        16.1.2. The name of the person for whom the labor was done, or materials or equipment furnished;

        16.1.3. A copy of the agreement or purchase order pursuant to which labor, materials, or equipment was furnished for use in the performance of the Construction Contract;

        16.1.4. A brief description of the labor, materials, or equipment furnished;

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16.1.5. The date on which the Claimant last performed labor or last furnished materials or equipment for use in the performance of the Construction Contract;

16.1.6. The total amount earned by the Claimant for labor, materials, or equipment furnished as of the date of the Claim;

16.1.7. The total amount of previous payments received by the Claimant; and

16.1.8. The total amount due and unpaid to the Claimant for labor, materials, or equipment furnished as of the date of the Claim.

16.2. *Claimant*—An individual or entity having a direct contract with the Contractor or with a subcontractor of the Contractor to furnish labor, materials, or equipment for use in the performance of the Construction Contract. The term Claimant also includes any individual or entity that has rightfully asserted a claim under an applicable mechanic's lien or similar statute against the real property upon which the Project is located. The intent of this Bond is to include without limitation in the terms of "labor, materials, or equipment" that part of the water, gas, power, light, heat, oil, gasoline, telephone service, or rental equipment used in the Construction Contract, architectural and engineering services required for performance of the work of the Contractor and the 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.

16.3. *Construction Contract*—The agreement between the Owner and Contractor identified on the cover page, including all Contract Documents and all changes made to the agreement and the Contract Documents.

16.4. *Owner Default*—Failure of the Owner, which has not been remedied or waived, to pay the Contractor as required under the Construction Contract or to perform and complete or comply with the other material terms of the Construction Contract.

16.5. *Contract Documents*—All the documents that comprise the agreement between the Owner and Contractor.

17. If this Bond is issued for an agreement between a contractor and subcontractor, the term Contractor in this Bond will be deemed to be Subcontractor and the term Owner will be deemed to be Contractor.

18. Modifications to this Bond are as follows: **[Describe modification or enter "None"]**

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PART 1 GENERAL

00.1.01 DESCRIPTION

A. The EJCDC C-620 Application for Payment Form (4 Pages) included herein will be used to facilitate periodic progress payments to the Contractor for Work completed and for stored materials and equipment (referred to in this document as "Stored Materials").

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

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Contractor's Application for Payment

Owner:		**Owner's Project No.:**	
Engineer:		**Engineer's Project No.:**	
Contractor:		**Contractor's Project No.:**	
Project:			
Contract:			
Application No.:		**Application Date:**	
Application Period:	**From**	**to**	

1. Original Contract Price		$ -
2. Net change by Change Orders		$ -
3. Current Contract Price (Line 1 + Line 2)		$ -
4. Total Work completed and materials stored to date (Sum of Column G Lump Sum Total and Column M Unit Price Total)		$ -
5. Retainage		
a. _____ X $ - Work Completed		$ -
b. _____ X $ - Stored Materials		$ -
c. Total Retainage (Line 5.a + Line 5.b)		$ -
6. Amount eligible to date (Line 4 - Line 5.c)		$ -
7. Less previous payments (Line 6 from prior application)		
8. Amount due this application		$ -
9. Balance to finish, including retainage (Line 3 - Line 4)		$ -

Contractor's Certification

The undersigned Contractor certifies, to the best of its knowledge, the following:
(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 the Work covered by prior Applications for Payment;
(2) Title to 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 the Work covered by this Application for Payment is in accordance with the Contract Documents and is not defective.

Contractor: _____

Signature: _____ **Date:** _____

Recommended by Engineer	**Approved by Owner**
By:	**By:**
Title:	**Title:**
Date:	**Date:**
Approved by Funding Agency	
By:	**By:**
Title:	**Title:**
Date:	**Date:**

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Progress Estimate - Lump Sum Work | **Contractor's Application for Payment**

Owner: _____ Owner's Project No.: _____
Engineer: _____ Engineer's Project No.: _____
Contractor: _____ Contractor's Project No.: _____
Project: _____
Contract: _____

Application No.: _____ Application Period: From _____ to _____ Application Date: _____

A	B	C	D	E	F	G	H	I
			Work Completed					
Item No.	Description	Scheduled Value ($)	(D + E) From Previous Application ($)	This Period ($)	Materials Currently Stored (not in D or E) ($)	Work Completed and Materials Stored to Date (D + E + F) ($)	% of Scheduled Value (G / C) (%)	Balance to Finish (C - G) ($)
Original Contract								
			-			-		-
						-		-
						-		-
						-		-
						-		-
						-		-
						-		-
						-		-
						-		-
						-		-
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						-		-
						-		-
						-		-
						-		-
						-		-
						-		-
						-		-
Original Contract Totals		$ -	$ -	$ -	$ -	$ -		$ -
Change Orders								
						-		-
						-		-
						-		-
						-		-
						-		-
Change Order Totals		$ -	$ -	$ -	$ -	$ -		$ -
Original Contract and Change Orders								
Project Totals		$ -	$ -	$ -	$ -	$ -		$ -

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Progress Estimate - Unit Price Work | **Contractor's Application for Payment**

Owner: _____ Owner's Project No.: _____
Engineer: _____ Engineer's Project No.: _____
Contractor: _____ Contractor's Project No.: _____
Project: _____
Contract: _____

Application No.: _____ Application Period: From _____ to _____ Application Date: _____

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
		Contract Information					Work Completed This Period		Work Completed to Date					
Bid Item No.	Description	Item Quantity	Units	Unit Price ($)	Value of Bid Item (C X E) ($)	Estimated Quantity Incorporated in the Work Previously	Estimated Quantity Incorporated in the Work this Period	Value of Work Completed this Period (E X H) ($)	Estimated Quantity Incorporated in the Work to Date	Value of Work Completed to Date (E X J) ($)	Materials Currently Stored (Not in J) ($)	Work Completed and Materials Stored to Date (K + L) ($)	% of Value of Item (M / F) (%)	Balance to Finish (F - M) ($)
Original Contract														
					-			-		-		-		-
					-			-		-		-		-
					-			-		-		-		-
					-			-		-		-		-
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					-			-		-		-		-
					-			-		-		-		-
				Original Contract Totals	$ -			$ -		$ -	$ -	$ -		$ -
Change Orders														
					-			-		-		-		-
					-			-		-		-		-
					-			-		-		-		-
					-			-		-		-		-
				Change Order Totals	$ -			$ -		$ -	$ -	$ -		$ -
Original Contract and Change Orders														
				Project Totals	$ -			$ -		$ -	$ -	$ -		$ -

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Stored Materials Summary

Contractor's Application for Payment

Owner: _____ Owner's Project No.: _____

Engineer: _____ Engineer's Project No.: _____

Contractor: _____ Contractor's Project No.: _____

Project: _____

Contract: _____

Application No.: _____ Application Period: From _____ to _____ Application Date: _____

A	B	C	D	E	F	G	H	I	J	K	L	M
						Materials Stored			Incorporated in Work			
Item No. (Lump Sum Tab) or Bid Item No. (Unit Price Tab)	Supplier Invoice No.	Submittal No. (with Specification Section No.)	Description of Materials or Equipment Stored	Storage Location	Application No. When Materials Placed in Storage	Previous Amount Stored ($)	Amount Stored this Period ($)	Amount Stored to Date (G+H) ($)	Amount Previously Incorporated in the Work ($)	Amount Incorporated in the Work this Period ($)	Total Amount Incorporated in the Work (J+K) ($)	Materials Remaining in Storage (I-L) ($)
								-			-	-
								-			-	-
								-			-	-
								-			-	-
								-			-	-
								-			-	-
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								-			-	-
								-			-	-
					Totals	$ -	$ -	$ -	$ -	$ -	$ -	$ -

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ATTACHMENT A.1 – CERTIFICATE OF OWNER'S ATTORNEY AND AGENCY CONCURRENCE

Notes to User:

1. This attachment consists of two certificates, on a single page, to be attached to the Contract and signed upon execution.

2. The first is a certificate to be signed by the Owner's attorney and the second is the concurrence to be signed by the State Engineer.

3. This page is to be inserted after the Agreement between Owner and Contractor for Construction Contract (Stipulated Price) (EJCDC C-520, 2018) in the Construction Contract Documents.

4. When the EJCDC C-522 Contract for Construction of a Small Project is used, attach this page to the C-522 document.

CERTFICATE OF OWNER'S ATTORNEY

PROJECT NAME:

CONTRACTOR NAME AND CONTRACT NUMBER:

I, the undersigned, _____, the duly authorized and acting legal representative of _____, do hereby certify as follows: I have examined the attached Contract(s) and performance and payment bond(s) and the manner of execution thereof, and I am of the opinion that each of the aforesaid agreements is adequate and has been duly executed by the proper parties thereto acting through their duly authorized representatives; that said representatives have full power and authority to execute said agreements on behalf of the respective parties named thereon; and that the foregoing agreements constitute valid and legally binding obligations upon the parties executing the same in accordance with the terms, conditions, and provisions thereof.

Name Date

AGENCY CONCURRENCE

As lender or insurer of funds to defray the costs of this Contract, and without liability for any payments thereunder, the Agency hereby concurs in the form, content, and execution of this Agreement.

Agency Representative Date

Name

PART 1 GENERAL

00.1.01 DESCRIPTION

A. The EJCDC C-941 Change Order (1 Page) as included herein will be used to make modifications to the Contract that change the Contract Price or Contract Times.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

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CHANGE ORDER NO.: [Number of Change Order]

Owner: Owner's Project No.:
Engineer: Engineer's Project No.:
Contractor: Contractor's Project No.:
Project:
Contract Name:
Date Issued: Effective Date of Change Order:

The Contract is modified as follows upon execution of this Change Order:

Description:

[Description of the change]

Attachments:

[List documents related to the change]

Change in Contract Price	**Change in Contract Times [State Contract Times as either a specific date or a number of days]**
Original Contract Price: $	Original Contract Times: Substantial Completion: Ready for final payment:
[Increase] [Decrease] from previously approved Change Orders No. 1 to No. **[Number of previous Change Order]**: $	**[Increase] [Decrease]** from previously approved Change Orders No.1 to No. **[Number of previous Change Order]**: Substantial Completion: Ready for final payment:
Contract Price prior to this Change Order: $	Contract Times prior to this Change Order: Substantial Completion: Ready for final payment:
[Increase] [Decrease] this Change Order: $	**[Increase] [Decrease]** this Change Order: Substantial Completion: Ready for final payment:
Contract Price incorporating this Change Order: $	Contract Times with all approved Change Orders: Substantial Completion: Ready for final payment:

	Recommended by Engineer (if required)	Accepted by Contractor
By:		
Title:		
Date:		
	Authorized by Owner	Approved by Funding Agency (if applicable)
By:		
Title:		
Date:		

EJCDC® C-941, Change Order EJCDC® C-941, Change Order, Rev.1.
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PART 1 GENERAL

00.1.01 DESCRIPTION

A. The EJCDC C-625 (2018) Certificate of Substantial Completion (1 Page) & C-626 (2018) Notice of Acceptability of Work (1 Page) as included herein will be used to make modifications to the Contract that change the Contract Price or Contract Times.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

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CERTIFICATE OF SUBSTANTIAL COMPLETION

Owner:
Engineer:
Contractor:
Project:
Contract Name:

Owner's Project No.:
Engineer's Project No.:
Contractor's Project No.:

This ☐ Preliminary ☐ Final Certificate of Substantial Completion applies to:

☐ All Work ☐ The following specified portions of the Work:

[Describe the portion of the work for which Certificate of Substantial Completion is issued]

Date of Substantial Completion: **[Enter date, as determined by Engineer]**

The Work to which this Certificate applies has been inspected by authorized representatives of Owner, Contractor, and Engineer, and found to be substantially complete. The Date of Substantial Completion of the Work or portion thereof designated above is hereby established, subject to the provisions of the Contract pertaining to Substantial Completion. The date of Substantial Completion in the final Certificate of Substantial Completion marks the commencement of the contractual correction period and applicable warranties required by the Contract.

A punch list of items to be completed or corrected is attached to this Certificate. This list may not be all-inclusive, and the failure to include any items on such list does not alter the responsibility of the Contractor to complete all Work in accordance with the Contract Documents.

Amendments of contractual responsibilities recorded in this Certificate should be the product of mutual agreement of Owner and Contractor; see Paragraph 15.03.D of the General Conditions.

The responsibilities between Owner and Contractor for security, operation, safety, maintenance, heat, utilities, insurance, and warranties upon Owner's use or occupancy of the Work must be as provided in the Contract, except as amended as follows:

Amendments to Owner's Responsibilities: ☐ None ☐ As follows:

[List amendments to Owner's Responsibilities]

Amendments to Contractor's Responsibilities: ☐ None ☐ As follows:

[List amendments to Contractor's Responsibilities]

The following documents are attached to and made a part of this Certificate:

[List attachments such as punch list; other documents]

This Certificate does not constitute an acceptance of Work not in accordance with the Contract Documents, nor is it a release of Contractor's obligation to complete the Work in accordance with the Contract Documents.

Engineer

By *(signature)*: _____

Name *(printed)*: _____

Title: _____

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NOTICE OF ACCEPTABILITY OF WORK

Owner:	Owner's Project No.:
Engineer:	Engineer's Project No.:
Contractor:	Contractor's Project No.:
Project:	
Contract Name:	
Notice Date:	Effective Date of the Construction Contract:

The Engineer hereby gives notice to the Owner and Contractor that Engineer recommends final payment to Contractor, and that the Work furnished and performed by Contractor under the Construction Contract is acceptable, expressly subject to the provisions of the Construction Contract's Contract Documents ("Contract Documents") and of the Agreement between Owner and Engineer for Professional Services dated **[date of professional services agreement]** ("Owner-Engineer Agreement"). This Notice of Acceptability of Work (Notice) is made expressly subject to the following terms and conditions to which all who receive and rely on said Notice agree:

1. This Notice has been prepared with the skill and care ordinarily used by members of the engineering profession practicing under similar conditions at the same time and in the same locality.
2. This Notice reflects and is an expression of the Engineer's professional opinion.
3. This Notice has been prepared to the best of Engineer's knowledge, information, and belief as of the Notice Date.
4. This Notice is based entirely on and expressly limited by the scope of services Engineer has been employed by Owner to perform or furnish during construction of the Project (including observation of the Contractor's Work) under the Owner-Engineer Agreement, and applies only to facts that are within Engineer's knowledge or could reasonably have been ascertained by Engineer as a result of carrying out the responsibilities specifically assigned to Engineer under such Owner-Engineer Agreement.
5. This Notice is not a guarantee or warranty of Contractor's performance under the Construction Contract, an acceptance of Work that is not in accordance with the Contract Documents, including but not limited to defective Work discovered after final inspection, nor an assumption of responsibility for any failure of Contractor to furnish and perform the Work thereunder in accordance with the Contract Documents, or to otherwise comply with the Contract Documents or the terms of any special guarantees specified therein.
6. This Notice does not relieve Contractor of any surviving obligations under the Construction Contract, and is subject to Owner's reservations of rights with respect to completion and final payment.

Engineer

By *(signature)*: _____

Name *(printed)*: _____

Title: _____

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PART 1 GENERAL

00.1.01 DESCRIPTION

A. The EJCDC C-700 Table of Contents (5 pages) and the EJCDC C-700 General Conditions (70 Pages) as included herein will be used to define basic rights, responsibilities, risk allocations, and relationships of the Owner and Contractor, and establish how the Contract is administered.

00.1.02 RELATED WORK SPECIFIED ELSEWHERE

A. The following items of related work are specified and included in other sections of these Specifications:

SECTION 00 73 00 SUPPLEMENTARY CONDITIONS

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

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STANDARD GENERAL CONDITIONS OF THE CONSTRUCTION CONTRACT

ARTICLE 1—DEFINITIONS AND TERMINOLOGY

1.01 *Defined Terms*

A. Wherever used in the Bidding Requirements or Contract Documents, a term printed with initial capital letters, including the term's singular and plural forms, will have the meaning indicated in the definitions below. 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, executed by Owner and Contractor, that sets forth the Contract Price and Contract Times, identifies the parties and the Engineer, and designates the specific items that are Contract Documents.

3. *Application for Payment*—The document prepared by Contractor, in a form acceptable to Engineer, to request progress or final payments, and which is to be accompanied by such supporting documentation as is required by the Contract Documents.

4. *Bid*—The offer of a Bidder submitted on the prescribed form setting forth the prices for the Work to be performed.

5. *Bidder*—An individual or entity that submits a Bid to Owner.

6. *Bidding Documents*—The Bidding Requirements, the proposed Contract Documents, and all Addenda.

7. *Bidding Requirements*—The Advertisement or invitation to bid, Instructions to Bidders, Bid Bond or other Bid security, if any, the Bid Form, and the Bid with any attachments.

8. *Change Order*—A document 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, or other revision to the Contract, issued on or after the Effective Date of the Contract.

9. *Change Proposal*—A written request by Contractor, duly submitted in compliance with the procedural requirements set forth herein, seeking an adjustment in Contract Price or Contract Times; contesting an initial decision by Engineer concerning the requirements of the Contract Documents or the acceptability of Work under the Contract Documents; challenging a set-off against payments due; or seeking other relief with respect to the terms of the Contract.

10. *Claim*

a. A demand or assertion by Owner directly to Contractor, duly submitted in compliance with the procedural requirements set forth herein, seeking an adjustment of Contract Price or Contract Times; contesting an initial decision by Engineer concerning the

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requirements of the Contract Documents or the acceptability of Work under the Contract Documents; contesting Engineer's decision regarding a Change Proposal; seeking resolution of a contractual issue that Engineer has declined to address; or seeking other relief with respect to the terms of the Contract.

b. A demand or assertion by Contractor directly to Owner, duly submitted in compliance with the procedural requirements set forth herein, contesting Engineer's decision regarding a Change Proposal, or seeking resolution of a contractual issue that Engineer has declined to address.

c. A demand or assertion by Owner or Contractor, duly submitted in compliance with the procedural requirements set forth herein, made pursuant to Paragraph 12.01.A.4, concerning disputes arising after Engineer has issued a recommendation of final payment.

d. A demand for money or services by a third party is not a Claim.

11. *Constituent of Concern*—Asbestos, petroleum, radioactive materials, polychlorinated biphenyls (PCBs), lead-based paint (as defined by the HUD/EPA standard), hazardous waste, and any substance, product, waste, or other material of any nature whatsoever that is or becomes listed, regulated, or addressed pursuant to Laws and Regulations regulating, relating to, or imposing liability or standards of conduct concerning, any hazardous, toxic, or dangerous waste, substance, or material.

12. *Contract*—The entire and integrated written contract between Owner and Contractor concerning the Work.

13. *Contract Documents*—Those items so designated in the Agreement, and which together comprise the Contract.

14. *Contract Price*—The money that Owner has agreed to pay Contractor for completion of the Work in accordance with the Contract Documents.

15. *Contract Times*—The number of days or the dates by which Contractor shall: (a) achieve Milestones, if any; (b) achieve Substantial Completion; and (c) complete the Work.

16. *Contractor*—The individual or entity with which Owner has contracted for performance of the Work.

17. *Cost of the Work*—See Paragraph 13.01 for definition.

18. *Drawings*—The part of the Contract that graphically shows the scope, extent, and character of the Work to be performed by Contractor.

19. *Effective Date of the Contract*—The date, indicated in the Agreement, on which the Contract becomes effective.

20. *Electronic Document*—Any Project-related correspondence, attachments to correspondence, data, documents, drawings, information, or graphics, including but not limited to Shop Drawings and other Submittals, that are in an electronic or digital format.

21. *Electronic Means*—Electronic mail (email), upload/download from a secure Project website, or other communications methods that allow: (a) the transmission or communication of Electronic Documents; (b) the documentation of transmissions, including sending and receipt; (c) printing of the transmitted Electronic Document by the

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recipient; (d) the storage and archiving of the Electronic Document by sender and recipient; and (e) the use by recipient of the Electronic Document for purposes permitted by this Contract. Electronic Means does not include the use of text messaging, or of Facebook, Twitter, Instagram, or similar social media services for transmission of Electronic Documents.

22. *Engineer*—The individual or entity named as such in the Agreement.

23. *Field Order*—A written order issued by Engineer which requires minor changes in the Work but does not change the Contract Price or the Contract Times.

24. *Hazardous Environmental Condition*—The presence at the Site of Constituents of Concern in such quantities or circumstances that may present a danger to persons or property exposed thereto.

    a. The presence at the Site of materials that are necessary for the execution of the Work, or that are to be incorporated into the Work, and that are controlled and contained pursuant to industry practices, Laws and Regulations, and the requirements of the Contract, is not a Hazardous Environmental Condition.

    b. The presence of Constituents of Concern that are to be removed or remediated as part of the Work is not a Hazardous Environmental Condition.

    c. The presence of Constituents of Concern as part of the routine, anticipated, and obvious working conditions at the Site, is not a Hazardous Environmental Condition.

25. *Laws and Regulations; Laws or Regulations*—Any and all applicable laws, statutes, rules, regulations, ordinances, codes, and binding decrees, resolutions, and orders of any and all governmental bodies, agencies, authorities, and courts having jurisdiction.

26. *Liens*—Charges, security interests, or encumbrances upon Contract-related funds, real property, or personal property.

27. *Milestone*—A principal event in the performance of the Work that the Contract requires Contractor to achieve by an intermediate completion date, or by a time prior to Substantial Completion of all the Work.

28. *Notice of Award*—The written notice by Owner to a Bidder of Owner's acceptance of the Bid.

29. *Notice to Proceed*—A written notice 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.

30. *Owner*—The individual or entity with which Contractor has contracted regarding the Work, and which has agreed to pay Contractor for the performance of the Work, pursuant to the terms of the Contract.

31. *Progress Schedule*—A schedule, prepared and maintained by Contractor, describing the sequence and duration of the activities comprising Contractor's plan to accomplish the Work within the Contract Times.

32. *Project*—The total undertaking to be accomplished for Owner by engineers, contractors, and others, including planning, study, design, construction, testing, commissioning, and start-up, and of which the Work to be performed under the Contract Documents is a part.

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33. *Resident Project Representative*—The authorized representative of Engineer assigned to assist Engineer at the Site. As used herein, the term Resident Project Representative (RPR) includes any assistants or field staff of Resident Project Representative.

34. *Samples*—Physical examples of materials, equipment, or workmanship that are representative of some portion of the Work and that establish the standards by which such portion of the Work will be judged.

35. *Schedule of Submittals*—A schedule, prepared and maintained by Contractor, of required submittals and the time requirements for Engineer's review of the submittals.

36. *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.

37. *Shop Drawings*—All drawings, diagrams, illustrations, schedules, and other data or information that are specifically prepared or assembled by or for Contractor and submitted by Contractor to illustrate some portion of the Work. Shop Drawings, whether approved or not, are not Drawings and are not Contract Documents.

38. *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, and such other lands or areas furnished by Owner which are designated for the use of Contractor.

39. *Specifications*—The part of the Contract that consists of written requirements for materials, equipment, systems, standards, and workmanship as applied to the Work, and certain administrative requirements and procedural matters applicable to the Work.

40. *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.

41. *Submittal*—A written or graphic document, prepared by or for Contractor, which the Contract Documents require Contractor to submit to Engineer, or that is indicated as a Submittal in the Schedule of Submittals accepted by Engineer. Submittals may include Shop Drawings and Samples; schedules; product data; Owner-delegated designs; sustainable design information; information on special procedures; testing plans; results of tests and evaluations, source quality-control testing and inspections, and field or Site quality-control testing and inspections; warranties and certifications; Suppliers' instructions and reports; records of delivery of spare parts and tools; operations and maintenance data; Project photographic documentation; record documents; and other such documents required by the Contract Documents. Submittals, whether or not approved or accepted by Engineer, are not Contract Documents. Change Proposals, Change Orders, Claims, notices, Applications for Payment, and requests for interpretation or clarification are not Submittals.

42. *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 of such Work.

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43. *Successful Bidder*—The Bidder to which the Owner makes an award of contract.

44. *Supplementary Conditions*—The part of the Contract that amends or supplements these General Conditions.

45. *Supplier*—A manufacturer, fabricator, supplier, distributor, 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 a Subcontractor.

46. *Technical Data*

    a. Those items expressly identified as Technical Data in the Supplementary Conditions, with respect to either (1) existing subsurface conditions at or adjacent to the Site, or existing physical conditions at or adjacent to the Site including existing surface or subsurface structures (except Underground Facilities) or (2) Hazardous Environmental Conditions at the Site.

    b. If no such express identifications of Technical Data have been made with respect to conditions at the Site, then Technical Data is defined, with respect to conditions at the Site under Paragraphs 5.03, 5.04, and 5.06, as the data contained in boring logs, recorded measurements of subsurface water levels, assessments of the condition of subsurface facilities, laboratory test results, and other factual, objective information regarding conditions at the Site that are set forth in any geotechnical, environmental, or other Site or facilities conditions report prepared for the Project and made available to Contractor.

    c. Information and data regarding the presence or location of Underground Facilities are not intended to be categorized, identified, or defined as Technical Data, and instead Underground Facilities are shown or indicated on the Drawings.

47. *Underground Facilities*—All active or not-in-service underground lines, pipelines, conduits, ducts, encasements, cables, wires, manholes, vaults, tanks, tunnels, or other such facilities or systems at the Site, including but not limited to those facilities or systems that produce, transmit, distribute, or convey telephone or other communications, cable television, fiber optic transmissions, power, electricity, light, heat, gases, oil, crude oil products, liquid petroleum products, water, steam, waste, wastewater, storm water, other liquids or chemicals, or traffic or other control systems. An abandoned facility or system is not an Underground Facility.

48. *Unit Price Work*—Work to be paid for on the basis of unit prices.

49. *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; furnishing, installing, and incorporating all materials and equipment into such construction; and may include related services such as testing, start-up, and commissioning, all as required by the Contract Documents.

50. *Work Change Directive*—A written directive to Contractor issued on or after the Effective Date of the Contract, signed by Owner and recommended by Engineer, ordering an addition, deletion, or revision in the Work.

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1.02 *Terminology*

A. The words and terms discussed in Paragraphs 1.02.B, C, D, and E are not defined terms that require initial capital letters, but, when used in the Bidding Requirements or Contract Documents, have the indicated meaning.

B. *Intent of Certain Terms or Adjectives*: 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 Article 10 or any other provision of the Contract Documents.

C. *Day*: The word "day" means a calendar day of 24 hours measured from midnight to the next midnight.

D. *Defective*: The word "defective," when modifying the word "Work," refers to Work that is unsatisfactory, faulty, or deficient in that it:

1. does not conform to the Contract Documents;

2. does not meet the requirements of any applicable inspection, reference standard, test, or approval referred to in the Contract Documents; or

3. 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 15.03 or Paragraph 15.04).

E. *Furnish, Install, Perform, Provide*

1. The word "furnish," when used in connection with services, materials, or equipment, means 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, means 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, means to furnish and install said services, materials, or equipment complete and ready for intended use.

4. If the Contract Documents establish an obligation of Contractor with respect to specific services, materials, or equipment, but do not expressly use any of the four words "furnish," "install," "perform," or "provide," then Contractor shall furnish and install said services, materials, or equipment complete and ready for intended use.

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F. *Contract Price or Contract Times*: References to a change in "Contract Price or Contract Times" or "Contract Times or Contract Price" or similar, indicate that such change applies to (1) Contract Price, (2) Contract Times, or (3) both Contract Price and Contract Times, as warranted, even if the term "or both" is not expressed.

G. 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 Performance and Payment Bonds; Evidence of Insurance*

A. *Performance and Payment Bonds*: When Contractor delivers the signed counterparts of the Agreement to Owner, Contractor shall also deliver to Owner the performance bond and payment bond (if the Contract requires Contractor to furnish such bonds).

B. *Evidence of Contractor's Insurance*: When Contractor delivers the signed counterparts of the Agreement to Owner, Contractor shall also deliver to Owner, with copies to each additional insured (as identified in the Contract), the certificates, endorsements, and other evidence of insurance required to be provided by Contractor in accordance with Article 6, except to the extent the Supplementary Conditions expressly establish other dates for delivery of specific insurance policies.

C. *Evidence of Owner's Insurance*: After receipt of the signed counterparts of the Agreement and all required bonds and insurance documentation, Owner shall promptly deliver to Contractor, with copies to each additional insured (as identified in the Contract), the certificates and other evidence of insurance required to be provided by Owner under Article 6.

2.02 *Copies of Documents*

A. Owner shall furnish to Contractor four printed copies of the Contract (including one fully signed counterpart of the Agreement), and one copy in electronic portable document format (PDF). Additional printed copies will be furnished upon request at the cost of reproduction.

B. Owner shall maintain and safeguard at least one original printed record version of the Contract, including Drawings and Specifications signed and sealed by Engineer and other design professionals. Owner shall make such original printed record version of the Contract available to Contractor for review. Owner may delegate the responsibilities under this provision to Engineer.

2.03 *Before Starting Construction*

A. *Preliminary Schedules*: Within 10 days after the Effective Date of the Contract (or as otherwise required by the Contract Documents), 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;

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

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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.

2.04 *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 2.03.A, procedures for handling Shop Drawings, Samples, and other Submittals, processing Applications for Payment, electronic or digital transmittals, 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 and receive information, render decisions relative to the Contract, and otherwise act on behalf of each respective party.

2.05 *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 the schedules submitted in accordance with Paragraph 2.03.A. No progress payment will 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 the component parts of the Work.

4. If a schedule is not acceptable, Contractor will have an additional 10 days to revise and resubmit the schedule.

2.06 *Electronic Transmittals*

A. Except as otherwise stated elsewhere in the Contract, the Owner, Engineer, and Contractor may send, and shall accept, Electronic Documents transmitted by Electronic Means.

B. If the Contract does not establish protocols for Electronic Means, then Owner, Engineer, and Contractor shall jointly develop such protocols.

C. Subject to any governing protocols for Electronic Means, when transmitting Electronic Documents by Electronic Means, the transmitting party makes no representations as to long-term compatibility, usability, or readability of the Electronic Documents resulting from the recipient's use of software application packages, operating systems, or computer hardware differing from those used in the drafting or transmittal of the Electronic Documents.

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ARTICLE 3—CONTRACT DOCUMENTS: INTENT, REQUIREMENTS, REUSE

3.01 *Intent*

A. The Contract Documents are complementary; what is required by one Contract Document 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.

C. Unless otherwise stated in the Contract Documents, if there is a discrepancy between the electronic versions of the Contract Documents (including any printed copies derived from such electronic versions) and the printed record version, the printed record version will govern.

D. The Contract supersedes prior negotiations, representations, and agreements, whether written or oral.

E. Engineer will issue clarifications and interpretations of the Contract Documents as provided herein.

F. Any provision or part of the Contract Documents held to be void or unenforceable under any Law or Regulation will be deemed stricken, and all remaining provisions will continue to be valid and binding upon Owner and Contractor, which agree that the Contract Documents will 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.

G. Nothing in the Contract Documents creates:

1. any contractual relationship between Owner or Engineer and any Subcontractor, Supplier, or other individual or entity performing or furnishing any of the Work, for the benefit of such Subcontractor, Supplier, or other individual or entity; or

2. any obligation on the part of Owner or Engineer to pay or to see to the payment of any money due any such Subcontractor, Supplier, or other individual or entity, except as may otherwise be required by Laws and Regulations.

3.02 *Reference Standards*

A. *Standards Specifications, Codes, Laws and Regulations*

1. Reference in the Contract Documents to standard specifications, manuals, reference standards, or codes of any technical society, organization, or association, or to Laws or Regulations, whether such reference be specific or by implication, means the standard specification, manual, reference standard, code, or Laws or Regulations in effect at the time of opening of Bids (or on the Effective Date of the Contract 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, reference standard, or code, and no instruction of a Supplier, will be effective to change the duties or responsibilities of Owner, Contractor, or Engineer from those set forth in the part of the Contract Documents prepared by or for Engineer. No such provision or instruction shall be effective to assign to Owner or Engineer any duty or authority to supervise or direct the performance of the Work, or any duty or authority to undertake responsibility

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inconsistent with the provisions of the part of the Contract Documents prepared by or for Engineer.

3.03 *Reporting and Resolving Discrepancies*

A. *Reporting Discrepancies*

1. *Contractor's Verification of Figures and Field Measurements*: Before undertaking each part of the Work, Contractor shall carefully study the Contract Documents, and check and verify pertinent figures and dimensions therein, particularly with respect to applicable field measurements. Contractor shall promptly report in writing to Engineer any conflict, error, ambiguity, or discrepancy that Contractor discovers, or has actual knowledge of, and shall not proceed with any Work affected thereby until the conflict, error, ambiguity, or discrepancy is resolved by a clarification or interpretation by Engineer, or by an amendment or supplement to the Contract issued pursuant to Paragraph 11.01.

2. *Contractor's Review of Contract Documents*: If, before or 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) actual field conditions, (c) any standard specification, manual, reference standard, or code, or (d) 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 7.15) until the conflict, error, ambiguity, or discrepancy is resolved, by a clarification or interpretation by Engineer, or by an amendment or supplement to the Contract issued pursuant to Paragraph 11.01.

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 part of the Contract Documents prepared by or for Engineer take precedence in resolving any conflict, error, ambiguity, or discrepancy between such provisions of the Contract Documents and:

a. the provisions of any standard specification, manual, reference standard, or code, or the instruction of any Supplier (whether or not specifically incorporated by reference as a Contract Document); 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 *Requirements of the Contract Documents*

A. During the performance of the Work and until final payment, Contractor and Owner shall submit to the Engineer in writing all matters in question concerning the requirements of the Contract Documents (sometimes referred to as requests for information or interpretation—RFIs), or relating to the acceptability of the Work under the Contract Documents, as soon as possible after such matters arise. Engineer will be the initial interpreter of the requirements of the Contract Documents, and judge of the acceptability of the Work.

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B. Engineer will, with reasonable promptness, render a written clarification, interpretation, or decision on the issue submitted, or initiate an amendment or supplement to the Contract Documents. Engineer's written clarification, interpretation, or decision will be final and binding on Contractor, unless it appeals by submitting a Change Proposal, and on Owner, unless it appeals by filing a Claim.

C. If a submitted matter in question concerns terms and conditions of the Contract Documents that do not involve (1) the performance or acceptability of the Work under the Contract Documents, (2) the design (as set forth in the Drawings, Specifications, or otherwise), or (3) other engineering or technical matters, then Engineer will promptly notify Owner and Contractor in writing that Engineer is unable to provide a decision or interpretation. If Owner and Contractor are unable to agree on resolution of such a matter in question, either party may pursue resolution as provided in Article 12.

3.05 *Reuse of Documents*

A. Contractor and its Subcontractors and Suppliers 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 versions, or 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; or

2. have or acquire any title or ownership rights in any other Contract Documents, reuse any such Contract Documents for any purpose without Owner's express written consent, or violate any copyrights pertaining to such Contract Documents.

B. The prohibitions of this Paragraph 3.05 will survive final payment, or termination of the Contract. Nothing herein precludes Contractor from retaining copies of the Contract Documents for record purposes.

ARTICLE 4—COMMENCEMENT AND PROGRESS OF THE WORK

4.01 *Commencement of Contract Times; Notice to Proceed*

A. The Contract Times will commence to run on the 30th day after the Effective Date of the Contract 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 Contract. In no event will the Contract Times commence to run later than the 60th day after the day of Bid opening or the 30th day after the Effective Date of the Contract, whichever date is earlier.

4.02 *Starting the Work*

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

4.03 *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

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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.

4.04 *Progress Schedule*

A. Contractor shall adhere to the Progress Schedule established in accordance with Paragraph 2.05 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 2.05) proposed adjustments in the Progress Schedule that will not result in changing the Contract Times.

2. Proposed adjustments in the Progress Schedule that will change the Contract Times must be submitted in accordance with the requirements of Article 11.

B. Contractor shall carry on the Work and adhere to the Progress Schedule during all disputes or disagreements with Owner. No Work will be delayed or postponed pending resolution of any disputes or disagreements, or during any appeal process, except as permitted by Paragraph 16.04, or as Owner and Contractor may otherwise agree in writing.

4.05 *Delays in Contractor's Progress*

A. If Owner, Engineer, 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 Contract Price or Contract Times.

B. Contractor shall not be entitled to an adjustment in Contract Price or Contract Times for delay, disruption, or interference caused by or within the control of Contractor. Delay, disruption, and interference attributable to and within the control of a Subcontractor or Supplier shall be deemed to be within the control of Contractor.

C. If Contractor's performance or progress is delayed, disrupted, or interfered with by unanticipated causes not the fault of and beyond the control of Owner, Contractor, and those for which they are responsible, then Contractor shall be entitled to an equitable adjustment in Contract Times. Such an adjustment will be Contractor's sole and exclusive remedy for the delays, disruption, and interference described in this paragraph. Causes of delay, disruption, or interference that may give rise to an adjustment in Contract Times under this paragraph include but are not limited to the following:

1. Severe and unavoidable natural catastrophes such as fires, floods, epidemics, and earthquakes;

2. Abnormal weather conditions;

3. Acts or failures to act of third-party utility owners or other third-party entities (other than those third-party utility owners or other third-party entities performing other work at or adjacent to the Site as arranged by or under contract with Owner, as contemplated in Article 8); and

4. Acts of war or terrorism.

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D. Contractor's entitlement to an adjustment of Contract Times or Contract Price is limited as follows:

1. Contractor's entitlement to an adjustment of the Contract Times is conditioned on the delay, disruption, or interference adversely affecting an activity on the critical path to completion of the Work, as of the time of the delay, disruption, or interference.

2. Contractor shall not be entitled to an adjustment in Contract Price for any delay, disruption, or interference if such delay is concurrent with a delay, disruption, or interference caused by or within the control of Contractor. Such a concurrent delay by Contractor shall not preclude an adjustment of Contract Times to which Contractor is otherwise entitled.

3. Adjustments of Contract Times or Contract Price are subject to the provisions of Article 11.

E. Each Contractor request or Change Proposal seeking an increase in Contract Times or Contract Price must be supplemented by supporting data that sets forth in detail the following:

1. The circumstances that form the basis for the requested adjustment;

2. The date upon which each cause of delay, disruption, or interference began to affect the progress of the Work;

3. The date upon which each cause of delay, disruption, or interference ceased to affect the progress of the Work;

4. The number of days' increase in Contract Times claimed as a consequence of each such cause of delay, disruption, or interference; and

5. The impact on Contract Price, in accordance with the provisions of Paragraph 11.07.

Contractor shall also furnish such additional supporting documentation as Owner or Engineer may require including, where appropriate, a revised progress schedule indicating all the activities affected by the delay, disruption, or interference, and an explanation of the effect of the delay, disruption, or interference on the critical path to completion of the Work.

F. Delays, disruption, and interference to the performance or progress of the Work resulting from the existence of a differing subsurface or physical condition, an Underground Facility that was not shown or indicated by the Contract Documents, or not shown or indicated with reasonable accuracy, and those resulting from Hazardous Environmental Conditions, are governed by Article 5, together with the provisions of Paragraphs 4.05.D and 4.05.E.

G. Paragraph 8.03 addresses delays, disruption, and interference to the performance or progress of the Work resulting from the performance of certain other work at or adjacent to the Site.

ARTICLE 5—SITE; SUBSURFACE AND PHYSICAL CONDITIONS; HAZARDOUS ENVIRONMENTAL CONDITIONS

5.01 *Availability of Lands*

A. Owner shall furnish the Site. Owner shall notify Contractor in writing 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.

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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 permanent improvements are to be made 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.

5.02 *Use of Site and Other Areas*

A. *Limitation on Use of Site and Other Areas*

1. Contractor shall confine construction equipment, temporary construction facilities, the storage of materials and equipment, and the operations of workers to the Site, adjacent areas that Contractor has arranged to use through construction easements or otherwise, and other adjacent areas permitted by Laws and Regulations, and shall not unreasonably encumber the Site and such other adjacent areas with construction equipment or other materials or equipment. Contractor shall assume full responsibility for (a) damage to the Site; (b) damage to any such other adjacent areas used for Contractor's operations; (c) damage to any other adjacent land or areas, or to improvements, structures, utilities, or similar facilities located at such adjacent lands or areas; and (d) for injuries and losses sustained by the owners or occupants of any such land or areas; provided that such damage or injuries result from the performance of the Work or from other actions or conduct of the Contractor or those for which Contractor is responsible.

2. If a damage or injury claim is made by the owner or occupant of any such land or area because of the performance of the Work, or because of other actions or conduct of the Contractor or those for which Contractor is responsible, Contractor shall (a) take immediate corrective or remedial action as required by Paragraph 7.13, or otherwise; (b) promptly attempt to settle the claim as to all parties through negotiations with such owner or occupant, or otherwise resolve the claim by arbitration or other dispute resolution proceeding, or in a court of competent jurisdiction; and (c) to the fullest extent permitted by Laws and Regulations, 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 any such claim, and against all 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 directly or indirectly, in whole or in part by, or based upon, Contractor's performance of the Work, or because of other actions or conduct of the Contractor or those for which Contractor is responsible.

B. *Removal of Debris During Performance of the Work*: During the progress of the Work the Contractor shall keep the Site and other adjacent areas free from accumulations of waste materials, rubbish, and other debris. Removal and disposal of such waste materials, rubbish, and other debris will 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 and adjacent areas all tools, appliances, construction equipment

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and machinery, and surplus materials and shall restore to original condition all property not designated for alteration by the Contract Documents.

D. *Loading of 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 structures or land to stresses or pressures that will endanger them.

5.03 *Subsurface and Physical Conditions*

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

1. Those reports of explorations and tests of subsurface conditions at or adjacent to the Site that contain Technical Data;

2. Those drawings of existing physical conditions at or adjacent to the Site, including those drawings depicting existing surface or subsurface structures at or adjacent to the Site (except Underground Facilities), that contain Technical Data; and

3. Technical Data contained in such reports and drawings.

B. *Underground Facilities*: Underground Facilities are shown or indicated on the Drawings, pursuant to Paragraph 5.05, and not in the drawings referred to in Paragraph 5.03.A. Information and data regarding the presence or location of Underground Facilities are not intended to be categorized, identified, or defined as Technical Data.

C. *Reliance by Contractor on Technical Data*: Contractor may rely upon the accuracy of the Technical Data expressly identified in the Supplementary Conditions with respect to such reports and drawings, but such reports and drawings are not Contract Documents. If no such express identification has been made, then Contractor may rely upon the accuracy of the Technical Data as defined in Paragraph 1.01.A.46.b.

D. *Limitations of Other Data and Documents*: Except for such reliance on 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;

2. other data, interpretations, opinions, and information contained in such reports or shown or indicated in such drawings;

3. the contents of other Site-related documents made available to Contractor, such as record drawings from other projects at or adjacent to the Site, or Owner's archival documents concerning the Site; or

4. any Contractor interpretation of or conclusion drawn from any Technical Data or any such other data, interpretations, opinions, or information.

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5.04 *Differing Subsurface or Physical Conditions*

A. *Notice by Contractor*: If Contractor believes that any subsurface or physical condition that is uncovered or revealed at the Site:

1. is of such a nature as to establish that any Technical Data on which Contractor is entitled to rely as provided in Paragraph 5.03 is materially inaccurate;

2. is of such a nature as to require a change in the Drawings or Specifications;

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 7.15), notify Owner and Engineer in writing about such condition. Contractor shall not further disturb such condition or perform any Work in connection therewith (except with respect to an emergency) until receipt of a written statement permitting Contractor to do so.

B. *Engineer's Review*: After receipt of written notice as required by the preceding paragraph, Engineer will promptly review the subsurface or physical condition in question; determine whether it is necessary for Owner to obtain additional exploration or tests with respect to the condition; conclude whether the condition falls within any one or more of the differing site condition categories in Paragraph 5.04.A; obtain any pertinent cost or schedule information from Contractor; prepare recommendations to Owner regarding the Contractor's resumption of Work in connection with the subsurface or physical condition in question and the need for any change in the Drawings or Specifications; and advise Owner in writing of Engineer's findings, conclusions, and recommendations.

C. *Owner's Statement to Contractor Regarding Site Condition*: After receipt of Engineer's written findings, conclusions, and recommendations, Owner shall issue a written statement to Contractor (with a copy to Engineer) regarding the subsurface or physical condition in question, addressing the resumption of Work in connection with such condition, indicating whether any change in the Drawings or Specifications will be made, and adopting or rejecting Engineer's written findings, conclusions, and recommendations, in whole or in part.

D. *Early Resumption of Work*: If at any time Engineer determines that Work in connection with the subsurface or physical condition in question may resume prior to completion of Engineer's review or Owner's issuance of its statement to Contractor, because the condition in question has been adequately documented, and analyzed on a preliminary basis, then the Engineer may at its discretion instruct Contractor to resume such Work.

E. *Possible Price and Times Adjustments*

1. Contractor shall be entitled to an equitable adjustment in Contract Price or Contract Times, to the extent that the existence of a differing subsurface or physical condition, or any related delay, disruption, or interference, causes an increase or decrease in

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Contractor's cost of, or time required for, performance of the Work; subject, however, to the following:

a. Such condition must fall within any one or more of the categories described in Paragraph 5.04.A;

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 Paragraph 13.03; and,

c. Contractor's entitlement to an adjustment of the Contract Times is subject to the provisions of Paragraphs 4.05.D and 4.05.E.

2. Contractor shall not be entitled to any adjustment in the Contract Price or Contract Times with respect to a subsurface or physical condition if:

a. Contractor knew of the existence of such condition at the time Contractor made a 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 otherwise;

b. The existence of such condition reasonably could have been discovered or revealed as a result of any examination, investigation, exploration, test, or study of the Site and contiguous areas expressly required by the Bidding Requirements or Contract Documents to be conducted by or for Contractor prior to Contractor's making such commitment; or

c. Contractor failed to give the written notice required by Paragraph 5.04.A.

3. If Owner and Contractor agree regarding Contractor's entitlement to and the amount or extent of any adjustment in the Contract Price or Contract Times, then any such adjustment will be set forth in a Change Order.

4. Contractor may submit a Change Proposal regarding its entitlement to or the amount or extent of any adjustment in the Contract Price or Contract Times, no later than 30 days after Owner's issuance of the Owner's written statement to Contractor regarding the subsurface or physical condition in question.

F. *Underground Facilities; Hazardous Environmental Conditions*: Paragraph 5.05 governs rights and responsibilities regarding the presence or location of Underground Facilities. Paragraph 5.06 governs rights and responsibilities regarding Hazardous Environmental Conditions. The provisions of Paragraphs 5.03 and 5.04 are not applicable to the presence or location of Underground Facilities, or to Hazardous Environmental Conditions.

5.05 *Underground Facilities*

A. *Contractor's Responsibilities*: Unless it is otherwise expressly provided in the Supplementary Conditions, the cost of all of the following are included in the Contract Price, and Contractor shall have full responsibility for:

1. reviewing and checking all information and data regarding existing Underground Facilities at the Site;

2. complying with applicable state and local utility damage prevention Laws and Regulations;

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3. verifying the actual location of those Underground Facilities shown or indicated in the Contract Documents as being within the area affected by the Work, by exposing such Underground Facilities during the course of construction;

4. coordination of the Work with the owners (including Owner) of such Underground Facilities, during construction; and

5. the safety and protection of all existing Underground Facilities at the Site, and repairing any damage thereto resulting from the Work.

B. *Notice by Contractor*: If Contractor believes that an Underground Facility that is uncovered or revealed at the Site was not shown or indicated on the Drawings, or was not shown or indicated on the Drawings with reasonable accuracy, then 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 7.15), notify Owner and Engineer in writing regarding such Underground Facility.

C. *Engineer's Review*: Engineer will:

1. promptly review the Underground Facility and conclude whether such Underground Facility was not shown or indicated on the Drawings, or was not shown or indicated with reasonable accuracy;

2. identify and communicate with the owner of the Underground Facility; prepare recommendations to Owner (and if necessary issue any preliminary instructions to Contractor) regarding the Contractor's resumption of Work in connection with the Underground Facility in question;

3. obtain any pertinent cost or schedule information from Contractor; determine the extent, if any, to which a change is required in the Drawings or Specifications to reflect and document the consequences of the existence or location of the Underground Facility; and

4. advise Owner in writing of Engineer's findings, conclusions, and recommendations.

During such time, Contractor shall be responsible for the safety and protection of such Underground Facility.

D. *Owner's Statement to Contractor Regarding Underground Facility*: After receipt of Engineer's written findings, conclusions, and recommendations, Owner shall issue a written statement to Contractor (with a copy to Engineer) regarding the Underground Facility in question addressing the resumption of Work in connection with such Underground Facility, indicating whether any change in the Drawings or Specifications will be made, and adopting or rejecting Engineer's written findings, conclusions, and recommendations in whole or in part.

E. *Early Resumption of Work*: If at any time Engineer determines that Work in connection with the Underground Facility may resume prior to completion of Engineer's review or Owner's issuance of its statement to Contractor, because the Underground Facility in question and conditions affected by its presence have been adequately documented, and analyzed on a preliminary basis, then the Engineer may at its discretion instruct Contractor to resume such Work.

F. *Possible Price and Times Adjustments*

1. Contractor shall be entitled to an equitable adjustment in the Contract Price or Contract Times, to the extent that any existing Underground Facility at the Site that was not shown

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or indicated on the Drawings, or was not shown or indicated with reasonable accuracy, or any related delay, disruption, or interference, causes an increase or decrease in Contractor's cost of, or time required for, performance of the Work; subject, however, to the following:

a. 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 Paragraph 13.03;

b. Contractor's entitlement to an adjustment of the Contract Times is subject to the provisions of Paragraphs 4.05.D and 4.05.E; and

c. Contractor gave the notice required in Paragraph 5.05.B.

2. If Owner and Contractor agree regarding Contractor's entitlement to and the amount or extent of any adjustment in the Contract Price or Contract Times, then any such adjustment will be set forth in a Change Order.

3. Contractor may submit a Change Proposal regarding its entitlement to or the amount or extent of any adjustment in the Contract Price or Contract Times, no later than 30 days after Owner's issuance of the Owner's written statement to Contractor regarding the Underground Facility in question.

4. The information and data shown or indicated on the Drawings with respect to existing Underground Facilities at the Site is based on information and data (a) furnished by the owners of such Underground Facilities, or by others, (b) obtained from available records, or (c) gathered in an investigation conducted in accordance with the current edition of ASCE 38, Standard Guideline for the Collection and Depiction of Existing Subsurface Utility Data, by the American Society of Civil Engineers. If such information or data is incorrect or incomplete, Contractor's remedies are limited to those set forth in this Paragraph 5.05.F.

5.06 *Hazardous Environmental Conditions at Site*

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

1. those reports known to Owner relating to Hazardous Environmental Conditions that have been identified at or adjacent to the Site;

2. drawings known to Owner relating to Hazardous Environmental Conditions that have been identified at or adjacent to the Site; and

3. Technical Data contained in such reports and drawings.

B. *Reliance by Contractor on Technical Data Authorized*: Contractor may rely upon the accuracy of the Technical Data expressly identified in the Supplementary Conditions with respect to such reports and drawings, but such reports and drawings are not Contract Documents. If no such express identification has been made, then Contractor may rely on the accuracy of the Technical Data as defined in Paragraph 1.01.A.46.b. Except for such reliance on 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

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of construction to be employed by Contractor, and safety precautions and programs incident thereto;

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 removing or remediating any Hazardous Environmental Condition encountered, uncovered, or revealed at the Site unless such removal or remediation is expressly identified in the Contract Documents to be within the scope of the Work.

D. Contractor shall be responsible for controlling, containing, and duly removing all Constituents of Concern brought to the Site by Contractor, Subcontractors, Suppliers, or anyone else for whom Contractor is responsible, and for any associated costs; and for the costs of removing and remediating any Hazardous Environmental Condition created by the presence of any such Constituents of Concern.

E. If Contractor encounters, uncovers, or reveals a Hazardous Environmental Condition whose removal or remediation is not expressly identified in the Contract Documents as being within the scope of the Work, or if Contractor or anyone for whom Contractor is responsible creates a Hazardous Environmental Condition, then Contractor shall immediately: (1) secure or otherwise isolate such condition; (2) stop all Work in connection with such condition and in any area affected thereby (except in an emergency as required by Paragraph 7.15); and (3) 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 5.06.F. If Contractor or anyone for whom Contractor is responsible created the Hazardous Environmental Condition in question, then Owner may remove and remediate the Hazardous Environmental Condition, and impose a set-off against payments to account for the associated costs.

F. Contractor shall not resume Work in connection with such Hazardous Environmental Condition or in any affected area until after Owner has obtained any required permits related thereto, and delivered written notice to Contractor either (1) specifying that such condition and any affected area is or has been rendered safe for the resumption of Work, or (2) specifying any special conditions under which such Work may be resumed safely.

G. 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, as a result of such Work stoppage, such special conditions under which Work is agreed to be resumed by Contractor, or any costs or expenses incurred in response to the Hazardous Environmental Condition, then within 30 days of Owner's written notice regarding the resumption of Work, Contractor may submit a Change Proposal, or Owner may impose a set-off. Entitlement to any such adjustment is subject to the provisions of Paragraphs 4.05.D, 4.05.E, 11.07, and 11.08.

H. 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

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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, following the contractual change procedures in Article 11. Owner may have such deleted portion of the Work performed by Owner's own forces or others in accordance with Article 8.

I. 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, arbitration, or other dispute resolution costs) arising out of or relating to a Hazardous Environmental Condition, provided that such Hazardous Environmental Condition (1) was not shown or indicated in the Drawings, Specifications, or other Contract Documents, identified as Technical Data entitled to limited reliance pursuant to Paragraph 5.06.B, or identified in the Contract Documents to be included within the scope of the Work, and (2) was not created by Contractor or by anyone for whom Contractor is responsible. Nothing in this Paragraph 5.06.I obligates Owner to indemnify any individual or entity from and against the consequences of that individual's or entity's own negligence.

J. 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 failure to control, contain, or remove a Constituent of Concern brought to the Site by Contractor or by anyone for whom Contractor is responsible, or to a Hazardous Environmental Condition created by Contractor or by anyone for whom Contractor is responsible. Nothing in this Paragraph 5.06.J obligates Contractor to indemnify any individual or entity from and against the consequences of that individual's or entity's own negligence.

K. The provisions of Paragraphs 5.03, 5.04, and 5.05 do not apply to the presence of Constituents of Concern or to a Hazardous Environmental Condition uncovered or revealed at the Site.

ARTICLE 6—BONDS AND INSURANCE

6.01 *Performance, Payment, and Other Bonds*

A. Contractor shall furnish a performance bond and a payment bond, each in an amount at least equal to the Contract Price, as security for the faithful performance and payment of Contractor's obligations under the Contract. These bonds must remain in effect until one year after the date when final payment becomes due or until completion of the correction period specified in Paragraph 15.08, whichever is later, except as provided otherwise by Laws or Regulations, the terms of a prescribed bond form, the Supplementary Conditions, or other provisions of the Contract.

B. Contractor shall also furnish such other bonds (if any) as are required by the Supplementary Conditions or other provisions of the Contract.

C. All bonds must be in the form included in the Bidding Documents or otherwise specified by Owner prior to execution of the Contract, except as provided otherwise by Laws or

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Regulations, and must be issued and signed by a surety named in "Companies Holding Certificates of Authority as Acceptable Sureties on Federal Bonds and as Acceptable Reinsuring Companies" as published in Department Circular 570 (as amended and supplemented) by the Bureau of the Fiscal Service, U.S. Department of the Treasury. A bond 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 must show that it is effective on the date the agent or attorney-in-fact signed the accompanying bond.

D. Contractor shall obtain the required bonds from surety companies that are duly licensed or authorized, in the state or jurisdiction in which the Project is located, to issue bonds in the required amounts.

E. If the surety on a bond furnished by Contractor is declared bankrupt or becomes insolvent, or the surety ceases to meet the requirements above, then Contractor shall promptly notify Owner and Engineer in writing and shall, within 20 days after the event giving rise to such notification, provide another bond and surety, both of which must comply with the bond and surety requirements above.

F. If Contractor has failed to obtain a required bond, Owner may exclude the Contractor from the Site and exercise Owner's termination rights under Article 16.

G. Upon request to Owner from any Subcontractor, Supplier, or other person or entity claiming to have furnished labor, services, materials, or equipment used in the performance of the Work, Owner shall provide a copy of the payment bond to such person or entity.

H. Upon request to Contractor from any Subcontractor, Supplier, or other person or entity claiming to have furnished labor, services, materials, or equipment used in the performance of the Work, Contractor shall provide a copy of the payment bond to such person or entity.

6.02 *Insurance—General Provisions*

A. Owner and Contractor shall obtain and maintain insurance as required in this article and in the Supplementary Conditions.

B. All insurance required by the Contract to be purchased and maintained by Owner or Contractor shall be obtained from insurance companies that are duly licensed or authorized in the state or jurisdiction in which the Project is located to issue insurance policies for the required limits and coverages. Unless a different standard is indicated in the Supplementary Conditions, all companies that provide insurance policies required under this Contract shall have an A.M. Best rating of A-VII or better.

C. Alternative forms of insurance coverage, including but not limited to self-insurance and "Occupational Accident and Excess Employer's Indemnity Policies," are not sufficient to meet the insurance requirements of this Contract, unless expressly allowed in the Supplementary Conditions.

D. Contractor shall deliver to Owner, with copies to each additional insured identified in the Contract, certificates of insurance and endorsements establishing that Contractor has obtained and is maintaining the policies and coverages required by the Contract. Upon request by Owner or any other insured, Contractor shall also furnish other evidence of such required insurance, including but not limited to copies of policies, documentation of applicable self-insured retentions (if allowed) and deductibles, full disclosure of all relevant exclusions, and evidence of insurance required to be purchased and maintained by

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Subcontractors or Suppliers. In any documentation furnished under this provision, Contractor, Subcontractors, and Suppliers may block out (redact) (1) any confidential premium or pricing information and (2) any wording specific to a project or jurisdiction other than those applicable to this Contract.

E. Owner shall deliver to Contractor, with copies to each additional insured identified in the Contract, certificates of insurance and endorsements establishing that Owner has obtained and is maintaining the policies and coverages required of Owner by the Contract (if any). Upon request by Contractor or any other insured, Owner shall also provide other evidence of such required insurance (if any), including but not limited to copies of policies, documentation of applicable self-insured retentions (if allowed) and deductibles, and full disclosure of all relevant exclusions. In any documentation furnished under this provision, Owner may block out (redact) (1) any confidential premium or pricing information and (2) any wording specific to a project or jurisdiction other than those relevant to this Contract.

F. Failure of Owner or Contractor to demand such certificates or other evidence of the other party's full compliance with these insurance requirements, or failure of Owner or Contractor to identify a deficiency in compliance from the evidence provided, will not be construed as a waiver of the other party's obligation to obtain and maintain such insurance.

G. In addition to the liability insurance required to be provided by Contractor, the Owner, at Owner's option, may purchase and maintain Owner's own liability insurance. Owner's liability policies, if any, operate separately and independently from policies required to be provided by Contractor, and Contractor cannot rely upon Owner's liability policies for any of Contractor's obligations to the Owner, Engineer, or third parties.

H. Contractor shall require:

1. Subcontractors to purchase and maintain worker's compensation, commercial general liability, and other insurance that is appropriate for their participation in the Project, and to name as additional insureds Owner and Engineer (and any other individuals or entities identified in the Supplementary Conditions as additional insureds on Contractor's liability policies) on each Subcontractor's commercial general liability insurance policy; and

2. Suppliers to purchase and maintain insurance that is appropriate for their participation in the Project.

I. If either party does not purchase or maintain the insurance required of such party by the Contract, 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.

J. If Contractor has failed to obtain and maintain required insurance, Contractor's entitlement to enter or remain at the Site will end immediately, and Owner may impose an appropriate set-off against payment for any associated costs (including but not limited to the cost of purchasing necessary insurance coverage), and exercise Owner's termination rights under Article 16.

K. Without prejudice to any other right or remedy, if a party has failed to obtain required insurance, the other party may elect (but is in no way obligated) to obtain equivalent insurance to protect such other party's interests at the expense of the party who was required to provide such coverage, and the Contract Price will be adjusted accordingly.

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L. Owner does not represent that insurance coverage and limits established in this Contract necessarily will be adequate to protect Contractor or Contractor's interests. Contractor is responsible for determining whether such coverage and limits are adequate to protect its interests, and for obtaining and maintaining any additional insurance that Contractor deems necessary.

M. The insurance and insurance limits required herein will not be deemed as a limitation on Contractor's liability, or that of its Subcontractors or Suppliers, under the indemnities granted to Owner and other individuals and entities in the Contract or otherwise.

N. All the policies of insurance required to be purchased and maintained under this Contract will contain a provision or endorsement that the coverage afforded will not be canceled, or renewal refused, until at least 10 days prior written notice has been given to the purchasing policyholder. Within three days of receipt of any such written notice, the purchasing policyholder shall provide a copy of the notice to each other insured and Engineer.

6.03 *Contractor's Insurance*

A. *Required Insurance*: Contractor shall purchase and maintain Worker's Compensation, Commercial General Liability, and other insurance pursuant to the specific requirements of the Supplementary Conditions.

B. *General Provisions*: The policies of insurance required by this Paragraph 6.03 as supplemented must:

1. include at least the specific coverages required;

2. be written for not less than the limits provided, or those required by Laws or Regulations, whichever is greater;

3. remain in effect at least until the Work is complete (as set forth in Paragraph 15.06.D), and longer if expressly required elsewhere in this Contract, and at all times thereafter when Contractor may be correcting, removing, or replacing defective Work as a warranty or correction obligation, or otherwise, or returning to the Site to conduct other tasks arising from the Contract;

4. apply with respect to the performance of the Work, whether such performance is 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; and

5. include all necessary endorsements to support the stated requirements.

C. *Additional Insureds*: The Contractor's commercial general liability, automobile liability, employer's liability, umbrella or excess, pollution liability, and unmanned aerial vehicle liability policies, if required by this Contract, must:

1. include and list as additional insureds Owner and Engineer, and any individuals or entities identified as additional insureds in the Supplementary Conditions;

2. include coverage for the respective officers, directors, members, partners, employees, and consultants of all such additional insureds;

3. afford primary coverage to these additional insureds for all claims covered thereby (including as applicable those arising from both ongoing and completed operations);

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4. not seek contribution from insurance maintained by the additional insured; and

5. as to commercial general liability insurance, apply to additional insureds with respect to liability caused in whole or in part by Contractor's acts or omissions, or the acts and omissions of those working on Contractor's behalf, in the performance of Contractor's operations.

6.04 *Builder's Risk and Other Property Insurance*

A. *Builder's Risk*: Unless otherwise provided in the Supplementary Conditions, Contractor shall purchase and maintain builder's risk insurance upon the Work on a completed value basis, in the amount of the Work's full insurable replacement cost (subject to such deductible amounts as may be provided in the Supplementary Conditions or required by Laws and Regulations). The specific requirements applicable to the builder's risk insurance are set forth in the Supplementary Conditions.

B. *Property Insurance for Facilities of Owner Where Work Will Occur*: Owner is responsible for obtaining and maintaining property insurance covering each existing structure, building, or facility in which any part of the Work will occur, or to which any part of the Work will attach or be adjoined. Such property insurance will be written on a special perils (all-risk) form, on a replacement cost basis, providing coverage consistent with that required for the builder's risk insurance, and will be maintained until the Work is complete, as set forth in Paragraph 15.06.D.

C. *Property Insurance for Substantially Complete Facilities*: Promptly after Substantial Completion, and before actual occupancy or use of the substantially completed Work, Owner will obtain property insurance for such substantially completed Work, and maintain such property insurance at least until the Work is complete, as set forth in Paragraph 15.06.D. Such property insurance will be written on a special perils (all-risk) form, on a replacement cost basis, and provide coverage consistent with that required for the builder's risk insurance. The builder's risk insurance may terminate upon written confirmation of Owner's procurement of such property insurance.

D. *Partial Occupancy or Use by Owner*: If Owner will occupy or use a portion or portions of the Work prior to Substantial Completion of all the Work, as provided in Paragraph 15.04, then Owner (directly, if it is the purchaser of the builder's risk policy, or through Contractor) will provide advance notice of such occupancy or use to the builder's risk insurer, and obtain an endorsement consenting to the continuation of coverage prior to commencing such partial occupancy or use.

E. *Insurance of Other Property; Additional Insurance*: If the express insurance provisions of the Contract do not require or address the insurance of a property item or interest, then the entity or individual owning such property item will be responsible for insuring it. If Contractor elects to obtain other special insurance to be included in or supplement the builder's risk or property insurance policies provided under this Paragraph 6.04, it may do so at Contractor's expense.

6.05 *Property Losses; Subrogation*

A. The builder's risk insurance policy purchased and maintained in accordance with Paragraph 6.04 (or an installation floater policy if authorized by the Supplementary Conditions), will contain provisions to the effect that in the event of payment of any loss or damage the insurer will have no rights of recovery against any insureds thereunder, or against

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Engineer or its consultants, or their officers, directors, members, partners, employees, agents, consultants, or subcontractors.

1. Owner and Contractor waive all rights against each other and the 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, risks, 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 Engineer, its consultants, all individuals or entities identified in the Supplementary Conditions as builder's risk or installation floater insureds, 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.
2. None of the above waivers extends to the rights that any party making such waiver may have to the proceeds of insurance held by Owner or Contractor as trustee or fiduciary, or otherwise payable under any policy so issued.

B. Any property insurance policy maintained by Owner covering any loss, damage, or consequential loss to Owner's existing structures, buildings, or facilities in which any part of the Work will occur, or to which any part of the Work will attach or adjoin; to adjacent structures, buildings, or facilities of Owner; or to part or all of the completed or substantially completed Work, during partial occupancy or use pursuant to Paragraph 15.04, after Substantial Completion pursuant to Paragraph 15.03, or after final payment pursuant to Paragraph 15.06, will contain provisions to the effect that in the event of payment of any loss or damage the insurer will have no rights of recovery against any insureds thereunder, or against Contractor, Subcontractors, or Engineer, or the officers, directors, members, partners, employees, agents, consultants, or subcontractors of each and any of them, and that the insured is allowed to waive the insurer's rights of subrogation in a written contract executed prior to the loss, damage, or consequential loss.

1. 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 all losses and damages caused by, arising out of, or resulting from fire or any of the perils, risks, or causes of loss covered by such policies.

C. The waivers in this Paragraph 6.05 include the waiver of rights 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 insured peril, risk, or cause of loss.

D. Contractor shall be responsible for assuring that each Subcontract contains provisions whereby the Subcontractor waives all rights against Owner, Contractor, all individuals or entities identified in the Supplementary Conditions as insureds, the Engineer and its consultants, 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 fire or other peril, risk, or cause of loss covered by builder's risk insurance, installation floater, and any other property insurance applicable to the Work.

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6.06 *Receipt and Application of Property Insurance Proceeds*

A. Any insured loss under the builder's risk and other policies of property insurance required by Paragraph 6.04 will be adjusted and settled with the named insured that purchased the policy. Such named insured shall act as fiduciary for the other insureds, and give notice to such other insureds that adjustment and settlement of a claim is in progress. Any other insured may state its position regarding a claim for insured loss in writing within 15 days after notice of such claim.

B. Proceeds for such insured losses may be made payable by the insurer either jointly to multiple insureds, or to the named insured that purchased the policy in its own right and as fiduciary for other insureds, subject to the requirements of any applicable mortgage clause. A named insured receiving insurance proceeds under the builder's risk and other policies of insurance required by Paragraph 6.04 shall maintain such proceeds in a segregated account, and distribute such proceeds in accordance with such agreement as the parties in interest may reach, or as otherwise required under the dispute resolution provisions of this Contract or applicable Laws and Regulations.

C. If no other special agreement is reached, Contractor shall repair or replace the damaged Work, using allocated insurance proceeds.

ARTICLE 7—CONTRACTOR'S RESPONSIBILITIES

7.01 *Contractor's Means and Methods of Construction*

A. Contractor shall be solely responsible for the means, methods, techniques, sequences, and procedures of construction.

B. If the Contract Documents note, or Contractor determines, that professional engineering or other design services are needed to carry out Contractor's responsibilities for construction means, methods, techniques, sequences, and procedures, or for Site safety, then Contractor shall cause such services to be provided by a properly licensed design professional, at Contractor's expense. Such services are not Owner-delegated professional design services under this Contract, and neither Owner nor Engineer has any responsibility with respect to (1) Contractor's determination of the need for such services, (2) the qualifications or licensing of the design professionals retained or employed by Contractor, (3) the performance of such services, or (4) any errors, omissions, or defects in such services.

7.02 *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.

B. At all times during the progress of the Work, Contractor shall assign a competent resident superintendent who will not be replaced without written notice to Owner and Engineer except under extraordinary circumstances.

7.03 *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 maintain good discipline and order at the Site.

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B. Contractor shall be fully responsible to Owner and Engineer for all acts and omissions of Contractor's employees; of Suppliers and Subcontractors, and their employees; and of any other individuals or entities performing or furnishing any of the Work, just as Contractor is responsible for Contractor's own acts and omissions.

C. 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 will be performed during regular working hours, Monday through Friday. Contractor will not perform Work on a Saturday, Sunday, or any legal holiday. Contractor may perform Work outside regular working hours or on Saturdays, Sundays, or legal holidays only with Owner's written consent, which will not be unreasonably withheld.

7.04 *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, whether or not such items are specifically called for in the Contract Documents.

B. All materials and equipment incorporated into the Work must be new and of good quality, except as otherwise provided in the Contract Documents. All special warranties and guarantees required by the Specifications will 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 must 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.

7.05 *"Or Equals"*

A. *Contractor's Request; Governing Criteria*: Whenever an item of equipment or material is specified or described in the Contract Documents by using the names of one or more proprietary items or specific Suppliers, the Contract Price has been based upon Contractor furnishing such item as specified. The specification or description of such an item 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 is permitted, Contractor may request that Engineer authorize the use of other items of equipment or material, or items from other proposed Suppliers, under the circumstances described below.

1. If Engineer in its sole discretion determines that an item of equipment or material proposed by Contractor is functionally equal to that named and sufficiently similar so that no change in related Work will be required, Engineer will deem it an "or equal" item. For the purposes of this paragraph, a proposed item of equipment or material will be considered functionally equal to an item so named if:

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

1) is at least equal in materials of construction, quality, durability, appearance, strength, and design characteristics;

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2) 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;

3) has a proven record of performance and availability of responsive service; and

4) is not objectionable to Owner.

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

1) there will be no increase in cost to the Owner or increase in Contract Times; and

2) the item will conform substantially to the detailed requirements of the item named in the Contract Documents.

B. *Contractor's Expense*: Contractor shall provide all data in support of any proposed "or equal" item at Contractor's expense.

C. *Engineer's Evaluation and Determination*: Engineer will be allowed a reasonable time to evaluate each "or-equal" request. Engineer may require Contractor to furnish additional data about the proposed "or-equal" item. Engineer will be the sole judge of acceptability. No "or-equal" item will be ordered, furnished, installed, or utilized until Engineer's review is complete and Engineer determines that the proposed item is an "or-equal," which will be evidenced by an approved Shop Drawing or other written communication. Engineer will advise Contractor in writing of any negative determination.

D. *Effect of Engineer's Determination*: Neither approval nor denial of an "or-equal" request will result in any change in Contract Price. The Engineer's denial of an "or-equal" request will be final and binding, and may not be reversed through an appeal under any provision of the Contract.

E. *Treatment as a Substitution Request*: If Engineer determines that an item of equipment or material proposed by Contractor does not qualify as an "or-equal" item, Contractor may request that Engineer consider the item a proposed substitute pursuant to Paragraph 7.06.

7.06 *Substitutes*

A. *Contractor's Request; Governing Criteria*: Unless the specification or description of an item of equipment or material required to be furnished under the Contract Documents contains or is followed by words reading that no substitution is permitted, Contractor may request that Engineer authorize the use of other items of equipment or material under the circumstances described below. To the extent possible such requests must be made before commencement of related construction at the Site.

1. Contractor shall submit sufficient information as provided below to allow Engineer to determine if the item of material or equipment proposed is functionally equivalent to that named and an acceptable substitute therefor. Engineer will not accept requests for review of proposed substitute items of equipment or material from anyone other than Contractor.

2. The requirements for review by Engineer will be as set forth in Paragraph 7.06.B, as supplemented by the Specifications, and as Engineer may decide is appropriate under the circumstances.

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

    a. will certify that the proposed substitute item will:

        1) perform adequately the functions and achieve the results called for by the general design;

        2) be similar in substance to the item specified; and

        3) be suited to the same use as the item specified.

    b. will state:

        1) the extent, if any, to which the use of the proposed substitute item will necessitate a change in Contract Times;

        2) 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

        3) whether incorporation or use of the proposed substitute item in connection with the Work is subject to payment of any license fee or royalty.

    c. will identify:

        1) all variations of the proposed substitute item from the item specified; and

        2) available engineering, sales, maintenance, repair, and replacement services.

    d. will contain an itemized estimate of all costs or credits that will result directly or indirectly from use of such substitute item, including but not limited to changes in Contract Price, shared savings, costs of redesign, and claims of other contractors affected by any resulting change.

B. *Engineer's Evaluation and Determination*: Engineer will be allowed a reasonable time to evaluate each substitute request, and to obtain comments and direction from Owner. Engineer may require Contractor to furnish additional data about the proposed substitute item. Engineer will be the sole judge of acceptability. No substitute will be ordered, furnished, installed, or utilized until Engineer's review is complete and Engineer determines that the proposed item is an acceptable substitute. Engineer's determination will be evidenced by a Field Order or a proposed Change Order accounting for the substitution itself and all related impacts, including changes in Contract Price or Contract Times. Engineer will advise Contractor in writing of any negative determination.

C. *Special Guarantee*: Owner may require Contractor to furnish at Contractor's expense a special performance guarantee or other surety with respect to any substitute.

D. *Reimbursement of Engineer's Cost*: Engineer will record Engineer's costs in evaluating a substitute proposed or submitted by Contractor. 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.

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E. *Contractor's Expense*: Contractor shall provide all data in support of any proposed substitute at Contractor's expense.

F. *Effect of Engineer's Determination*: If Engineer approves the substitution request, Contractor shall execute the proposed Change Order and proceed with the substitution. The Engineer's denial of a substitution request will be final and binding, and may not be reversed through an appeal under any provision of the Contract. Contractor may challenge the scope of reimbursement costs imposed under Paragraph 7.06.D, by timely submittal of a Change Proposal.

7.07 *Concerning Subcontractors and Suppliers*

A. Contractor may retain Subcontractors and Suppliers for the performance of parts of the Work. Such Subcontractors and Suppliers must be acceptable to Owner. The Contractor's retention of a Subcontractor or Supplier for the performance of parts of the Work will not relieve Contractor's obligation to Owner to perform and complete the Work in accordance with the Contract Documents.

B. Contractor shall retain specific Subcontractors and Suppliers for the performance of designated parts of the Work if required by the Contract to do so.

C. Subsequent to the submittal of Contractor's Bid or final negotiation of the terms of the Contract, Owner may not require Contractor to retain any Subcontractor or Supplier to furnish or perform any of the Work against which Contractor has reasonable objection.

D. Prior to entry into any binding subcontract or purchase order, Contractor shall submit to Owner the identity of the proposed Subcontractor or Supplier (unless Owner has already deemed such proposed Subcontractor or Supplier acceptable during the bidding process or otherwise). Such proposed Subcontractor or Supplier shall be deemed acceptable to Owner unless Owner raises a substantive, reasonable objection within 5 days.

E. Owner may require the replacement of any Subcontractor or Supplier. Owner also may require Contractor to retain specific replacements; provided, however, that Owner may not require a replacement to which Contractor has a reasonable objection. If Contractor has submitted the identity of certain Subcontractors or Suppliers for acceptance by Owner, and Owner has accepted it (either in writing or by failing to make written objection thereto), then Owner may subsequently revoke the acceptance of any such Subcontractor or Supplier so identified solely on the basis of substantive, reasonable objection after due investigation. Contractor shall submit an acceptable replacement for the rejected Subcontractor or Supplier.

F. If Owner requires the replacement of any Subcontractor or Supplier retained by Contractor to perform any part of the Work, then Contractor shall be entitled to an adjustment in Contract Price or Contract Times, with respect to the replacement; and Contractor shall initiate a Change Proposal for such adjustment within 30 days of Owner's requirement of replacement.

G. No acceptance by Owner of any such Subcontractor or Supplier, whether initially or as a replacement, will constitute a waiver of the right of Owner to the completion of the Work in accordance with the Contract Documents.

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H. On a monthly basis, Contractor shall submit to Engineer a complete list of all Subcontractors and Suppliers having a direct contract with Contractor, and of all other Subcontractors and Suppliers known to Contractor at the time of submittal.

I. Contractor shall be solely responsible for scheduling and coordinating the work of Subcontractors and Suppliers.

J. The divisions and sections of the Specifications and the identifications of any Drawings do not control Contractor in dividing the Work among Subcontractors or Suppliers, or in delineating the Work to be performed by any specific trade.

K. All Work performed for Contractor by a Subcontractor or Supplier must be pursuant to an appropriate contractual agreement that specifically binds the Subcontractor or Supplier to the applicable terms and conditions of the Contract for the benefit of Owner and Engineer.

L. Owner may furnish to any Subcontractor or Supplier, to the extent practicable, information about amounts paid to Contractor for Work performed for Contractor by the Subcontractor or Supplier.

M. Contractor shall restrict all Subcontractors and Suppliers from communicating with Engineer or Owner, except through Contractor or in case of an emergency, or as otherwise expressly allowed in this Contract.

7.08 *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 an 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 will be disclosed 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

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

7.09 *Permits*

A. Unless otherwise provided in the Contract Documents, Contractor shall obtain and pay for all construction permits, licenses, and certificates of occupancy. 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 the submission of Contractor's Bid (or when Contractor became bound under a negotiated contract). Owner shall pay all charges of utility owners for connections for providing permanent service to the Work.

7.10 *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.

7.11 *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. Neither Owner nor Engineer shall be responsible for monitoring Contractor's compliance with any Laws or Regulations.

B. If Contractor performs any Work or takes any other action knowing or having reason to know that it is contrary to Laws or Regulations, Contractor shall bear all resulting costs and losses, and 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 such Work or other action. It is not Contractor's responsibility to make certain that the Work described in the Contract Documents is in accordance with Laws and Regulations, but this does not relieve Contractor of its obligations under Paragraph 3.03.

C. Owner or Contractor may give written notice to the other party of any changes after the submission of Contractor's Bid (or after the date when Contractor became bound under a negotiated contract) in Laws or Regulations having an effect on the cost or time of performance of the Work, including but not limited to changes in Laws or Regulations having an effect on procuring permits and on sales, use, value-added, consumption, and other similar taxes. If Owner and Contractor are unable to agree on entitlement to or on the amount or extent, if any, of any adjustment in Contract Price or Contract Times resulting from such changes, then within 30 days of such written notice Contractor may submit a Change Proposal, or Owner may initiate a Claim.

7.12 *Record Documents*

A. Contractor shall maintain in a safe place at the Site one printed record copy of all Drawings, Specifications, Addenda, Change Orders, Work Change Directives, Field Orders, written interpretations and clarifications, and approved Shop Drawings. Contractor shall keep such record documents in good order and annotate them to show changes made during construction. These record documents, together with all approved Samples, will be available

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to Engineer for reference. Upon completion of the Work, Contractor shall deliver these record documents to Engineer.

7.13 *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.

B. Contractor shall designate a qualified and experienced safety representative whose duties and responsibilities are the prevention of Work-related accidents and the maintenance and supervision of safety precautions and programs.

C. 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, other work in progress, utilities, and Underground Facilities not designated for removal, relocation, or replacement in the course of construction.

D. All damage, injury, or loss to any property referred to in Paragraph 7.13.C.2 or 7.13.C.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 at its expense (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).

E. 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.

F. Contractor shall notify Owner; the owners of adjacent property; the owners of Underground Facilities and other utilities (if the identity of such owners is known to Contractor); and other contractors and utility owners performing work at or adjacent to the Site, in writing, when Contractor knows that prosecution of the Work may affect them, and shall cooperate with them in the protection, removal, relocation, and replacement of their property or work in progress.

G. Contractor shall comply with the applicable requirements of Owner's safety programs, if any. Any Owner's safety programs that are applicable to the Work are identified or included in the Supplementary Conditions or Specifications.

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H. 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.

I. Contractor's duties and responsibilities for safety and protection will continue until all the Work is completed, Engineer has issued a written notice to Owner and Contractor in accordance with Paragraph 15.06.C that the Work is acceptable, and Contractor has left the Site (except as otherwise expressly provided in connection with Substantial Completion).

J. Contractor's duties and responsibilities for safety and protection will resume whenever Contractor or any Subcontractor or Supplier returns to the Site to fulfill warranty or correction obligations, or to conduct other tasks arising from the Contract Documents.

7.14 *Hazard Communication Programs*

A. Contractor shall be responsible for coordinating any exchange of safety data sheets (formerly known as 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.

7.15 *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 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 by an emergency, or are required as a result of Contractor's response to an emergency. If Engineer determines that a change in the Contract Documents is required because of an emergency or Contractor's response, a Work Change Directive or Change Order will be issued.

7.16 *Submittals*

A. *Shop Drawing and Sample Requirements*

1. Before submitting a Shop Drawing or Sample, Contractor shall:

a. review and coordinate the Shop Drawing or Sample with other Shop Drawings and Samples and with the requirements of the Work and the Contract Documents;

b. determine and verify:

1) all field measurements, quantities, dimensions, specified performance and design criteria, installation requirements, materials, catalog numbers, and similar information with respect to the Submittal;

2) the suitability of all materials and equipment offered with respect to the indicated application, fabrication, shipping, handling, storage, assembly, and installation pertaining to the performance of the Work; and

3) all information relative to Contractor's responsibilities for means, methods, techniques, sequences, and procedures of construction, and safety precautions and programs incident thereto;

c. confirm that the Submittal is complete with respect to all related data included in the Submittal.

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2. Each Shop Drawing or Sample must bear a stamp or specific written certification that Contractor has satisfied Contractor's obligations under the Contract Documents with respect to Contractor's review of that Submittal, and that Contractor approves the Submittal.

3. With each Shop Drawing or Sample, Contractor shall give Engineer specific written notice of any variations that the Submittal may have from the requirements of the Contract Documents. This notice must be set forth in a written communication separate from the Submittal; and, in addition, in the case of a Shop Drawing by a specific notation made on the Shop Drawing itself.

B. *Submittal Procedures for Shop Drawings and Samples*: Contractor shall label and submit Shop Drawings and Samples to Engineer for review and approval in accordance with the accepted Schedule of Submittals.

1. *Shop Drawings*

a. Contractor shall submit the number of copies required in the Specifications.

b. Data shown on the Shop Drawings must 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 7.16.C.

2. *Samples*

a. Contractor shall submit the number of Samples required in the Specifications.

b. Contractor shall 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 7.16.C.

3. 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. *Engineer's Review of Shop Drawings and Samples*

1. Engineer will provide timely review of Shop Drawings and Samples in accordance with the accepted Schedule of Submittals. 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, comply with the requirements of 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, or to safety precautions or programs incident thereto.

3. Engineer's review and approval of a separate item as such will not indicate approval of the assembly in which the item functions.

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4. Engineer's review and approval of a Shop Drawing or Sample will not relieve Contractor from responsibility for any variation from the requirements of the Contract Documents unless Contractor has complied with the requirements of Paragraph 7.16.A.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 will document any such approved variation from the requirements of the Contract Documents in a Field Order or other appropriate Contract modification.

5. Engineer's review and approval of a Shop Drawing or Sample will not relieve Contractor from responsibility for complying with the requirements of Paragraphs 7.16.A and B.

6. Engineer's review and approval of a Shop Drawing or Sample, or of a variation from the requirements of the Contract Documents, will not, under any circumstances, change the Contract Times or Contract Price, unless such changes are included in a Change Order.

7. Neither Engineer's receipt, review, acceptance, or approval of a Shop Drawing or Sample will result in such item becoming a Contract Document.

8. Contractor shall perform the Work in compliance with the requirements and commitments set forth in approved Shop Drawings and Samples, subject to the provisions of Paragraph 7.16.C.4.

D. *Resubmittal Procedures for Shop Drawings and Samples*

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.

2. Contractor shall furnish required Shop Drawing and Sample submittals with sufficient information and accuracy to obtain required approval of an item with no more than two resubmittals. Engineer will record Engineer's time for reviewing a third or subsequent resubmittal of a Shop Drawing or Sample, and Contractor shall be responsible for Engineer's charges to Owner for such time. Owner may impose a set-off against payments due Contractor to secure reimbursement for such charges.

3. If Contractor requests a change of a previously approved Shop Drawing or Sample, Contractor shall be responsible for Engineer's charges to Owner for its review time, and Owner may impose a set-off against payments due Contractor to secure reimbursement for such charges, unless the need for such change is beyond the control of Contractor.

E. *Submittals Other than Shop Drawings, Samples, and Owner-Delegated Designs*

1. The following provisions apply to all Submittals other than Shop Drawings, Samples, and Owner-delegated designs:

   a. Contractor shall submit all such Submittals to the Engineer in accordance with the Schedule of Submittals and pursuant to the applicable terms of the Contract Documents.

   b. Engineer will provide timely review of all such Submittals in accordance with the Schedule of Submittals and return such Submittals with a notation of either Accepted or Not Accepted. Any such Submittal that is not returned within the time established in the Schedule of Submittals will be deemed accepted.

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c. Engineer's review will be only to determine if the Submittal is acceptable under the requirements of the Contract Documents as to general form and content of the Submittal.

d. If any such Submittal is not accepted, Contractor shall confer with Engineer regarding the reason for the non-acceptance, and resubmit an acceptable document.

2. Procedures for the submittal and acceptance of the Progress Schedule, the Schedule of Submittals, and the Schedule of Values are set forth in Paragraphs 2.03. 2.04, and 2.05.

F. Owner-delegated Designs: Submittals pursuant to Owner-delegated designs are governed by the provisions of Paragraph 7.19.

7.17 *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 is entitled to rely on Contractor's warranty and guarantee.

B. Owner's rights under this warranty and guarantee are in addition to, and are not limited by, Owner's rights under the correction period provisions of Paragraph 15.08. The time in which Owner may enforce its warranty and guarantee rights under this Paragraph 7.17 is limited only by applicable Laws and Regulations restricting actions to enforce such rights; provided, however, that after the end of the correction period under Paragraph 15.08:

1. Owner shall give Contractor written notice of any defective Work within 60 days of the discovery that such Work is defective; and

2. Such notice will be deemed the start of an event giving rise to a Claim under Paragraph 12.01.B, such that any related Claim must be brought within 30 days of the notice.

C. Contractor's warranty and guarantee hereunder excludes defects or damage caused by:

1. abuse, or improper modification, 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.

D. Contractor's obligation to perform and complete the Work in accordance with the Contract Documents is absolute. None of the following will constitute an acceptance of Work that is not in accordance with the Contract Documents, a release of Contractor's obligation to perform the Work in accordance with the Contract Documents, or a release of Owner's warranty and guarantee rights under this Paragraph 7.17:

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;

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6. The issuance of a notice of acceptability by Engineer;

7. The end of the correction period established in Paragraph 15.08;

8. Any inspection, test, or approval by others; or

9. Any correction of defective Work by Owner.

E. If the Contract requires the Contractor to accept the assignment of a contract entered into by Owner, then the specific warranties, guarantees, and correction obligations contained in the assigned contract will govern with respect to Contractor's performance obligations to Owner for the Work described in the assigned contract.

7.18 *Indemnification*

A. To the fullest extent permitted by Laws and Regulations, and in addition to any other obligations of Contractor under the Contract or otherwise, 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 losses, damages, costs, and judgments (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 from third-party claims or actions relating to or resulting from the performance or furnishing of the Work, provided that any such claim, action, loss, cost, judgment or damage is attributable to bodily injury, sickness, disease, or death, or to damage 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 7.18.A will 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.

7.19 *Delegation of Professional Design Services*

A. Owner may require Contractor to provide professional design services for a portion of the Work by express delegation in the Contract Documents. Such delegation will specify the performance and design criteria that such services must satisfy, and the Submittals that Contractor must furnish to Engineer with respect to the Owner-delegated design.

B. Contractor shall cause such Owner-delegated professional design services to be provided pursuant to the professional standard of care by a properly licensed design professional, whose signature and seal must appear on all drawings, calculations, specifications, certifications, and Submittals prepared by such design professional. Such design professional must issue all certifications of design required by Laws and Regulations.

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C. If a Shop Drawing or other Submittal related to the Owner-delegated design is prepared by Contractor, a Subcontractor, or others for submittal to Engineer, then such Shop Drawing or other Submittal must bear the written approval of Contractor's design professional when submitted by Contractor to Engineer.

D. Owner and Engineer shall be entitled to rely upon the adequacy, accuracy, and completeness of the services, certifications, and approvals performed or provided by the design professionals retained or employed by Contractor under an Owner-delegated design, subject to the professional standard of care and the performance and design criteria stated in the Contract Documents.

E. Pursuant to this Paragraph 7.19, Engineer's review, approval, and other determinations regarding design drawings, calculations, specifications, certifications, and other Submittals furnished by Contractor pursuant to an Owner-delegated design will be only for the following limited purposes:

1. Checking for conformance with the requirements of this Paragraph 7.19;

2. Confirming that Contractor (through its design professionals) has used the performance and design criteria specified in the Contract Documents; and

3. Establishing that the design furnished by Contractor is consistent with the design concept expressed in the Contract Documents.

F. Contractor shall not be responsible for the adequacy of performance or design criteria specified by Owner or Engineer.

G. Contractor is not required to provide professional services in violation of applicable Laws and Regulations.

ARTICLE 8—OTHER WORK AT THE SITE

8.01 *Other Work*

A. In addition to and apart from the Work under the Contract Documents, the Owner may perform other work at or adjacent to the Site. Such other work may be performed by Owner's employees, or through contracts between the Owner and third parties. Owner may also arrange to have third-party utility owners perform work on their utilities and facilities at or adjacent to the Site.

B. If Owner performs other work at or adjacent to the Site with Owner's employees, or through contracts for such other work, then Owner shall give Contractor written notice thereof prior to starting any such other work. If Owner has advance information regarding the start of any third-party utility work that Owner has arranged to take place at or adjacent to the Site, Owner shall provide such information to Contractor.

C. Contractor shall afford proper and safe access to the Site to each contractor that performs such other work, each utility owner performing other work, and Owner, if Owner is performing other work with Owner's employees, and provide a reasonable opportunity for the introduction and storage of materials and equipment and the execution of such other work.

D. 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

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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.

E. If the proper execution or results of any part of Contractor's Work depends upon work performed by others, 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.

F. The provisions of this article are not applicable to work that is performed by third-party utilities or other third-party entities without a contract with Owner, or that is performed without having been arranged by Owner. If such work occurs, then any related delay, disruption, or interference incurred by Contractor is governed by the provisions of Paragraph 4.05.C.3.

8.02 *Coordination*

A. If Owner intends to contract with others for the performance of other work at or adjacent to the Site, to perform other work at or adjacent to the Site with Owner's employees, or to arrange to have utility owners perform work at or adjacent to the Site, the following will be set forth in the Supplementary Conditions or provided to Contractor prior to the start of any such other work:

1. The identity of the individual or entity that will have authority and responsibility for coordination of the activities among the various contractors;

2. An itemization of the specific matters to be covered by such authority and responsibility; and

3. The extent of such authority and responsibilities.

B. Unless otherwise provided in the Supplementary Conditions, Owner shall have sole authority and responsibility for such coordination.

8.03 *Legal Relationships*

A. If, in the course of performing other work for Owner at or adjacent to the Site, the Owner's employees, any other contractor working for Owner, or any utility owner that Owner has arranged to perform work, causes damage to the Work or to the property of Contractor or its Subcontractors, or delays, disrupts, interferes with, or increases the scope or cost of the performance of the Work, through actions or inaction, then Contractor shall be entitled to an equitable adjustment in the Contract Price or the Contract Times. Contractor must submit any Change Proposal seeking an equitable adjustment in the Contract Price or the Contract Times under this paragraph within 30 days of the damaging, delaying, disrupting, or interfering event. The entitlement to, and extent of, any such equitable adjustment will take into account information (if any) regarding such other work that was provided to Contractor in the Contract Documents prior to the submittal of the Bid or the final negotiation of the terms of the Contract, and any remedies available to Contractor under Laws or Regulations concerning utility action or inaction. When applicable, any such equitable adjustment in Contract Price

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will be conditioned on Contractor assigning to Owner all Contractor's rights against such other contractor or utility owner with respect to the damage, delay, disruption, or interference that is the subject of the adjustment. Contractor's entitlement to an adjustment of the Contract Times or Contract Price is subject to the provisions of Paragraphs 4.05.D and 4.05.E.

B. Contractor shall take reasonable and customary measures to avoid damaging, delaying, disrupting, or interfering with the work of Owner, any other contractor, or any utility owner performing other work at or adjacent to the Site.

1. If Contractor fails to take such measures and as a result damages, delays, disrupts, or interferes with the work of any such other contractor or utility owner, then Owner may impose a set-off against payments due Contractor, and assign to such other contractor or utility owner the Owner's contractual rights against Contractor with respect to the breach of the obligations set forth in this Paragraph 8.03.B.

2. When Owner is performing other work at or adjacent to the Site with Owner's employees, Contractor shall be liable to Owner for damage to such other work, and for the reasonable direct delay, disruption, and interference costs incurred by Owner as a result of Contractor's failure to take reasonable and customary measures with respect to Owner's other work. In response to such damage, delay, disruption, or interference, Owner may impose a set-off against payments due Contractor.

C. If Contractor damages, delays, disrupts, or interferes with the work of any other contractor, or any utility owner performing other work at or adjacent to the Site, through Contractor's failure to take reasonable and customary measures to avoid such impacts, or if any claim arising out of Contractor's actions, inactions, or negligence in performance of the Work at or adjacent to the Site is made by any such other contractor or utility owner against Contractor, Owner, or Engineer, then Contractor shall (1) promptly attempt to settle the claim as to all parties through negotiations with such other contractor or utility owner, or otherwise resolve the claim by arbitration or other dispute resolution proceeding or at law, and (2) 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 any such claims, and against all 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 damage, delay, disruption, or interference.

ARTICLE 9—OWNER'S RESPONSIBILITIES

9.01 *Communications to Contractor*

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

9.02 *Replacement of Engineer*

A. Owner may at its discretion appoint an engineer to replace Engineer, provided Contractor makes no reasonable objection to the replacement engineer. The replacement engineer's status under the Contract Documents will be that of the former Engineer.

9.03 *Furnish Data*

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

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9.04 *Pay When Due*

A. Owner shall make payments to Contractor when they are due as provided in the Agreement.

9.05 *Lands and Easements; Reports, Tests, and Drawings*

A. Owner's duties with respect to providing lands and easements are set forth in Paragraph 5.01.

B. Owner's duties with respect to providing engineering surveys to establish reference points are set forth in Paragraph 4.03.

C. Article 5 refers to Owner's identifying and making available to Contractor copies of reports of explorations and tests of conditions at the Site, and drawings of physical conditions relating to existing surface or subsurface structures at the Site.

9.06 *Insurance*

A. Owner's responsibilities, if any, with respect to purchasing and maintaining liability and property insurance are set forth in Article 6.

9.07 *Change Orders*

A. Owner's responsibilities with respect to Change Orders are set forth in Article 11.

9.08 *Inspections, Tests, and Approvals*

A. Owner's responsibility with respect to certain inspections, tests, and approvals is set forth in Paragraph 14.02.B.

9.09 *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.

9.10 *Undisclosed Hazardous Environmental Condition*

A. Owner's responsibility in respect to an undisclosed Hazardous Environmental Condition is set forth in Paragraph 5.06.

9.11 *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 (including obligations under proposed changes in the Work).

9.12 *Safety Programs*

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.

B. Owner shall furnish copies of any applicable Owner safety programs to Contractor.

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ARTICLE 10—ENGINEER'S STATUS DURING CONSTRUCTION

10.01 *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.

10.02 *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 10.07. 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.

10.03 *Resident Project Representative*

A. If Owner and Engineer have agreed that Engineer will furnish a Resident Project Representative to represent Engineer at the Site and assist Engineer in observing the progress and quality of the Work, then the authority and responsibilities of any such Resident Project Representative will be as provided in the Supplementary Conditions, and limitations on the responsibilities thereof will be as provided in the Supplementary Conditions and in Paragraph 10.07.

B. If Owner designates an individual or entity who is not Engineer's consultant, agent, or employee to represent Owner at the Site, then the responsibilities and authority of such individual or entity will be as provided in the Supplementary Conditions.

10.04 *Engineer's Authority*

A. Engineer has the authority to reject Work in accordance with Article 14.

B. Engineer's authority as to Submittals is set forth in Paragraph 7.16.

C. Engineer's authority as to design drawings, calculations, specifications, certifications and other Submittals from Contractor in response to Owner's delegation (if any) to Contractor of professional design services, is set forth in Paragraph 7.19.

D. Engineer's authority as to changes in the Work is set forth in Article 11.

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E. Engineer's authority as to Applications for Payment is set forth in Article 15.

10.05 *Determinations for Unit Price Work*

A. Engineer will determine the actual quantities and classifications of Unit Price Work performed by Contractor as set forth in Paragraph 13.03.

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

A. Engineer will render decisions regarding the requirements of the Contract Documents, and judge the acceptability of the Work, pursuant to the specific procedures set forth herein for initial interpretations, Change Proposals, and acceptance of the Work. In rendering such decisions and judgments, Engineer will not show partiality to Owner or Contractor, and will not be liable to Owner, Contractor, or others in connection with any proceedings, interpretations, decisions, or judgments conducted or rendered in good faith.

10.07 *Limitations on Engineer's Authority and Responsibilities*

A. Neither Engineer's authority or responsibility under this Article 10 or under any other provision of the Contract, 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, will 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 Contractor under Paragraph 15.06.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 10.07 also apply to the Resident Project Representative, if any.

10.08 *Compliance with Safety Program*

A. While at the Site, Engineer's employees and representatives will comply with the specific applicable requirements of Owner's and Contractor's safety programs of which Engineer has been informed.

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ARTICLE 11—CHANGES TO THE CONTRACT

11.01 *Amending and Supplementing the Contract*

A. The Contract may be amended or supplemented by a Change Order, a Work Change Directive, or a Field Order.

B. If an amendment or supplement to the Contract includes a change in the Contract Price or the Contract Times, such amendment or supplement must be set forth in a Change Order.

C. All changes to the Contract that involve (1) the performance or acceptability of the Work, (2) the design (as set forth in the Drawings, Specifications, or otherwise), or (3) other engineering or technical matters, must be supported by Engineer's recommendation. Owner and Contractor may amend other terms and conditions of the Contract without the recommendation of the Engineer.

11.02 *Change Orders*

A. Owner and Contractor shall execute appropriate Change Orders covering:

1. Changes in 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;

2. Changes in Contract Price resulting from an Owner set-off, unless Contractor has duly contested such set-off;

3. Changes in the Work which are: (a) ordered by Owner pursuant to Paragraph 11.05, (b) required because of Owner's acceptance of defective Work under Paragraph 14.04 or Owner's correction of defective Work under Paragraph 14.07, or (c) agreed to by the parties, subject to the need for Engineer's recommendation if the change in the Work involves the design (as set forth in the Drawings, Specifications, or otherwise) or other engineering or technical matters; and

4. Changes that embody the substance of any final and binding results under: Paragraph 11.03.B, resolving the impact of a Work Change Directive; Paragraph 11.09, concerning Change Proposals; Article 12, Claims; Paragraph 13.02.D, final adjustments resulting from allowances; Paragraph 13.03.D, final adjustments relating to determination of quantities for Unit Price Work; and similar provisions.

B. If Owner or Contractor refuses to execute a Change Order that is required to be executed under the terms of Paragraph 11.02.A, it will be deemed to be of full force and effect, as if fully executed.

11.03 *Work Change Directives*

A. A Work Change Directive will not change the Contract Price or the Contract Times but is evidence that the parties expect that the modification ordered or documented by a Work Change Directive will be incorporated in a subsequently issued Change Order, following negotiations by the parties as to the Work Change Directive's effect, if any, on the Contract Price and Contract Times; or, if negotiations are unsuccessful, by a determination under the terms of the Contract Documents governing adjustments, expressly including Paragraph 11.07 regarding change of Contract Price.

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B. If Owner has issued a Work Change Directive and:

1. Contractor believes that an adjustment in Contract Times or Contract Price is necessary, then Contractor shall submit any Change Proposal seeking such an adjustment no later than 30 days after the completion of the Work set out in the Work Change Directive.

2. Owner believes that an adjustment in Contract Times or Contract Price is necessary, then Owner shall submit any Claim seeking such an adjustment no later than 60 days after issuance of the Work Change Directive.

11.04 *Field Orders*

A. Engineer may authorize minor changes in the Work if the changes 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. Such changes will be accomplished by a Field Order and will be binding on Owner and also on Contractor, which shall perform the Work involved promptly.

B. If Contractor believes that a Field Order justifies an adjustment in the Contract Price or Contract Times, then before proceeding with the Work at issue, Contractor shall submit a Change Proposal as provided herein.

11.05 *Owner-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. Changes involving the design (as set forth in the Drawings, Specifications, or otherwise) or other engineering or technical matters will be supported by Engineer's recommendation.

B. Such changes in the Work may be accomplished by a Change Order, if Owner and Contractor have agreed as to the effect, if any, of the changes on Contract Times or Contract Price; or by a Work Change Directive. Upon receipt of any such document, Contractor shall promptly proceed with the Work involved; or, in the case of a deletion in the Work, promptly cease construction activities with respect to such deleted Work. Added or revised Work must be performed under the applicable conditions of the Contract Documents.

C. Nothing in this Paragraph 11.05 obligates Contractor to undertake work that Contractor reasonably concludes cannot be performed in a manner consistent with Contractor's safety obligations under the Contract Documents or Laws and Regulations.

11.06 *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, except in the case of an emergency as provided in Paragraph 7.15 or in the case of uncovering Work as provided in Paragraph 14.05.C.2.

11.07 *Change of Contract Price*

A. The Contract Price may only be changed by a Change Order. Any Change Proposal for an adjustment in the Contract Price must comply with the provisions of Paragraph 11.09. Any Claim for an adjustment of Contract Price must comply with the provisions of Article 12.

B. An adjustment in the Contract Price will be determined as follows:

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1. Where the Work involved is covered by unit prices contained in the Contract Documents, then by application of such unit prices to the quantities of the items involved (subject to the provisions of Paragraph 13.03);

2. Where the Work involved is not covered by unit prices contained in the Contract Documents, then by a mutually agreed lump sum (which may include an allowance for overhead and profit not necessarily in accordance with Paragraph 11.07.C.2); or

3. Where the Work involved is not covered by unit prices contained in the Contract Documents and the parties do not reach mutual agreement to a lump sum, then on the basis of the Cost of the Work (determined as provided in Paragraph 13.01) plus a Contractor's fee for overhead and profit (determined as provided in Paragraph 11.07.C).

C. *Contractor's Fee*: When applicable, the Contractor's fee for overhead and profit will 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 13.01.B.1 and 13.01.B.2, the Contractor's fee will be 15 percent;

b. For costs incurred under Paragraph 13.01.B.3, the Contractor's fee will be 5 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 11.07.C.2.a and 11.07.C.2.b is that the Contractor's fee will be based on: (1) a fee of 15 percent of the costs incurred under Paragraphs 13.01.B.1 and 13.01.B.2 by the Subcontractor that actually performs the Work, at whatever tier, and (2) with respect to Contractor itself and to any Subcontractors of a tier higher than that of the Subcontractor that actually performs the Work, a fee of 5 percent of the amount (fee plus underlying costs incurred) attributable to the next lower tier Subcontractor; provided, however, that for any such subcontracted Work the maximum total fee to be paid by Owner will be no greater than 27 percent of the costs incurred by the Subcontractor that actually performs the Work;

d. No fee will be payable on the basis of costs itemized under Paragraphs 13.01.B.4, 13.01.B.5, and 13.01.C;

e. The amount of credit to be allowed by Contractor to Owner for any change which results in a net decrease in Cost of the Work will be the amount of the actual net decrease in Cost of the Work and a deduction of an additional amount equal to 5 percent of such actual net decrease in Cost of the Work; and

f. When both additions and credits are involved in any one change or Change Proposal, the adjustment in Contractor's fee will be computed by determining the sum of the costs in each of the cost categories in Paragraph 13.01.B (specifically, payroll costs, Paragraph 13.01.B.1; incorporated materials and equipment costs, Paragraph 13.01.B.2; Subcontract costs, Paragraph 13.01.B.3; special consultants costs, Paragraph 13.01.B.4; and other costs, Paragraph 13.01.B.5) and applying to each such cost category sum the appropriate fee from Paragraphs 11.07.C.2.a through 11.07.C.2.e, inclusive.

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11.08 *Change of Contract Times*

A. The Contract Times may only be changed by a Change Order. Any Change Proposal for an adjustment in the Contract Times must comply with the provisions of Paragraph 11.09. Any Claim for an adjustment in the Contract Times must comply with the provisions of Article 12.

B. Delay, disruption, and interference in the Work, and any related changes in Contract Times, are addressed in and governed by Paragraph 4.05.

11.09 *Change Proposals*

A. *Purpose and Content*: Contractor shall submit a Change Proposal to Engineer to request an adjustment in the Contract Times or Contract Price; contest an initial decision by Engineer concerning the requirements of the Contract Documents or relating to the acceptability of the Work under the Contract Documents; challenge a set-off against payment due; or seek other relief under the Contract. The Change Proposal will specify any proposed change in Contract Times or Contract Price, or other proposed relief, and explain the reason for the proposed change, with citations to any governing or applicable provisions of the Contract Documents. Each Change Proposal will address only one issue, or a set of closely related issues.

B. *Change Proposal Procedures*

1. *Submittal*: Contractor shall submit each Change Proposal to Engineer within 30 days after the start of the event giving rise thereto, or after such initial decision.

2. *Supporting Data*: The Contractor shall submit supporting data, including the proposed change in Contract Price or Contract Time (if any), to the Engineer and Owner within 15 days after the submittal of the Change Proposal.

    a. Change Proposals based on or related to delay, interruption, or interference must comply with the provisions of Paragraphs 4.05.D and 4.05.E.

    b. Change proposals related to a change of Contract Price must include full and detailed accounts of materials incorporated into the Work and labor and equipment used for the subject Work.

    The supporting data must be accompanied by a written statement that the supporting data are accurate and complete, and that any requested time or price adjustment is the entire adjustment to which Contractor believes it is entitled as a result of said event.

3. *Engineer's Initial Review*: Engineer will advise Owner regarding the Change Proposal, and consider any comments or response from Owner regarding the Change Proposal. If in its discretion Engineer concludes that additional supporting data is needed before conducting a full review and making a decision regarding the Change Proposal, then Engineer may request that Contractor submit such additional supporting data by a date specified by Engineer, prior to Engineer beginning its full review of the Change Proposal.

4. *Engineer's Full Review and Action on the Change Proposal*: Upon receipt of Contractor's supporting data (including any additional data requested by Engineer), Engineer will conduct a full review of each Change Proposal and, within 30 days after such receipt of the Contractor's supporting data, either approve the Change Proposal in whole, deny it in whole, or approve it in part and deny it in part. Such actions must be in writing, with a copy provided to Owner and Contractor. If Engineer does not take action on the Change

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Proposal within 30 days, then either Owner or Contractor may at any time thereafter submit a letter to the other party indicating that as a result of Engineer's inaction the Change Proposal is deemed denied, thereby commencing the time for appeal of the denial under Article 12.

5. *Binding Decision*: Engineer's decision is final and binding upon Owner and Contractor, unless Owner or Contractor appeals the decision by filing a Claim under Article 12.

C. *Resolution of Certain Change Proposals*: If the Change Proposal does not involve the design (as set forth in the Drawings, Specifications, or otherwise), the acceptability of the Work, or other engineering or technical matters, then Engineer will notify the parties in writing that the Engineer is unable to resolve the Change Proposal. For purposes of further resolution of such a Change Proposal, such notice will be deemed a denial, and Contractor may choose to seek resolution under the terms of Article 12.

D. *Post-Completion*: Contractor shall not submit any Change Proposals after Engineer issues a written recommendation of final payment pursuant to Paragraph 15.06.B.

11.10 *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.

ARTICLE 12—CLAIMS

12.01 *Claims*

A. *Claims Process*: The following disputes between Owner and Contractor are subject to the Claims process set forth in this article:

1. Appeals by Owner or Contractor of Engineer's decisions regarding Change Proposals;

2. Owner demands for adjustments in the Contract Price or Contract Times, or other relief under the Contract Documents;

3. Disputes that Engineer has been unable to address because they do not involve the design (as set forth in the Drawings, Specifications, or otherwise), the acceptability of the Work, or other engineering or technical matters; and

4. Subject to the waiver provisions of Paragraph 15.07, any dispute arising after Engineer has issued a written recommendation of final payment pursuant to Paragraph 15.06.B.

B. *Submittal of Claim*: The party submitting a Claim shall deliver it directly to the other party to the Contract promptly (but in no event later than 30 days) after the start of the event giving rise thereto; in the case of appeals regarding Change Proposals within 30 days of the decision under appeal. The party submitting the Claim shall also furnish a copy to the Engineer, for its information only. The responsibility to substantiate a Claim rests with the party making the Claim. In the case of a Claim by Contractor seeking an increase in the Contract Times or Contract Price, Contractor shall certify that the Claim is made in good faith, that the supporting data are accurate and complete, and that to the best of Contractor's knowledge

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and belief the amount of time or money requested accurately reflects the full amount to which Contractor is entitled.

C. *Review and Resolution*: The party receiving a Claim shall review it thoroughly, giving full consideration to its merits. The two parties shall seek to resolve the Claim through the exchange of information and direct negotiations. The parties may extend the time for resolving the Claim by mutual agreement. All actions taken on a Claim will be stated in writing and submitted to the other party, with a copy to Engineer.

D. *Mediation*

1. At any time after initiation of a Claim, Owner and Contractor may mutually agree to mediation of the underlying dispute. The agreement to mediate will stay the Claim submittal and response process.

2. If Owner and Contractor agree to mediation, then after 60 days from such agreement, either Owner or Contractor may unilaterally terminate the mediation process, and the Claim submittal and decision process will resume as of the date of the termination. If the mediation proceeds but is unsuccessful in resolving the dispute, the Claim submittal and decision process will resume as of the date of the conclusion of the mediation, as determined by the mediator.

3. Owner and Contractor shall each pay one-half of the mediator's fees and costs.

E. *Partial Approval*: If the party receiving a Claim approves the Claim in part and denies it in part, such action will be final and binding unless within 30 days of such action the other party invokes the procedure set forth in Article 17 for final resolution of disputes.

F. *Denial of Claim*: If efforts to resolve a Claim are not successful, the party receiving the Claim may deny it by giving written notice of denial to the other party. If the receiving party does not take action on the Claim within 90 days, then either Owner or Contractor may at any time thereafter submit a letter to the other party indicating that as a result of the inaction, the Claim is deemed denied, thereby commencing the time for appeal of the denial. A denial of the Claim will be final and binding unless within 30 days of the denial the other party invokes the procedure set forth in Article 17 for the final resolution of disputes.

G. *Final and Binding Results*: If the parties reach a mutual agreement regarding a Claim, whether through approval of the Claim, direct negotiations, mediation, or otherwise; or if a Claim is approved in part and denied in part, or denied in full, and such actions become final and binding; then the results of the agreement or action on the Claim will be incorporated in a Change Order or other written document to the extent they affect the Contract, including the Work, the Contract Times, or the Contract Price.

ARTICLE 13—COST OF THE WORK; ALLOWANCES; UNIT PRICE WORK

13.01 *Cost of the Work*

A. *Purposes for Determination of Cost of the Work*: The term Cost of the Work means the sum of all costs necessary for the proper performance of the Work at issue, as further defined below. The provisions of this Paragraph 13.01 are used for two distinct purposes:

1. To determine Cost of the Work when Cost of the Work is a component of the Contract Price, under cost-plus-fee, time-and-materials, or other cost-based terms; or

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2. When needed to determine the value of a Change Order, Change Proposal, Claim, set-off, or other adjustment in Contract Price. When the value of any such adjustment is determined on the basis of Cost of the Work, Contractor is entitled only to those additional or incremental costs required because of the change in the Work or because of the event giving rise to the adjustment.

B. *Costs Included*: Except as otherwise may be agreed to in writing by Owner, costs included in the Cost of the Work will be in amounts no higher than those commonly incurred in the locality of the Project, will not include any of the costs itemized in Paragraph 13.01.C, and will 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 in advance of the subject Work. Such employees include, without limitation, superintendents, foremen, safety managers, safety representatives, and other personnel employed full time on the Work. Payroll costs for employees not employed full time on the Work will be apportioned on the basis of their time spent on the Work. Payroll costs include, but are not limited to, salaries and wages plus the cost of fringe benefits, which include social security contributions, unemployment, excise, and payroll taxes, workers' compensation, health and retirement benefits, sick leave, and vacation and holiday pay applicable thereto. The expenses of performing Work outside of regular working hours, on Saturday, Sunday, or legal holidays, will 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 accrue to Contractor unless Owner deposits funds with Contractor with which to make payments, in which case the cash discounts will accrue to Owner. All trade discounts, rebates, and refunds and returns from sale of surplus materials and equipment will 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, which 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 will be determined in the same manner as Contractor's Cost of the Work and fee as provided in this Paragraph 13.01.

4. Costs of special consultants (including but not limited to engineers, architects, testing laboratories, surveyors, attorneys, and accountants) employed or retained for services specifically related to the Work.

5. Other costs consisting of 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, which are

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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.

1) In establishing included costs for materials such as scaffolding, plating, or sheeting, consideration will be given to the actual or the estimated life of the material for use on other projects; or rental rates may be established on the basis of purchase or salvage value of such items, whichever is less. Contractor will not be eligible for compensation for such items in an amount that exceeds the purchase cost of such item.

c. *Construction Equipment Rental*

1) Rentals of all construction equipment and machinery, and the parts thereof, in accordance with rental agreements approved by Owner as to price (including any surcharge or special rates applicable to overtime use of the construction equipment or machinery), and the costs of transportation, loading, unloading, assembly, dismantling, and removal thereof. All such costs will be in accordance with the terms of said rental agreements. The rental of any such equipment, machinery, or parts must cease when the use thereof is no longer necessary for the Work.

2) Costs for equipment and machinery owned by Contractor or a Contractor-related entity will be paid at a rate shown for such equipment in the equipment rental rate book specified in the Supplementary Conditions. An hourly rate will be computed by dividing the monthly rates by 176. These computed rates will include all operating costs.

3) With respect to Work that is the result of a Change Order, Change Proposal, Claim, set-off, or other adjustment in Contract Price ("changed Work"), included costs will be based on the time the equipment or machinery is in use on the changed Work and the costs of transportation, loading, unloading, assembly, dismantling, and removal when directly attributable to the changed Work. The cost of any such equipment or machinery, or parts thereof, must cease to accrue when the use thereof is no longer necessary for the changed 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 builder's risk or other property insurance established in accordance with Paragraph 6.04), 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 include settlements made with the written consent and approval of Owner. No such losses, damages, and expenses will be included in the Cost of the Work for the purpose of determining Contractor's fee.

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g. The cost of utilities, fuel, and sanitary facilities at the Site.

h. Minor expenses such as communication 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 that Contractor is required by the Contract Documents to purchase and maintain.

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

1. Payroll costs and other compensation of Contractor's officers, executives, principals, general managers, engineers, architects, estimators, attorneys, auditors, accountants, purchasing and contracting agents, expediters, 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 13.01.B.1 or specifically covered by Paragraph 13.01.B.4. The payroll costs and other compensation excluded here are to be considered administrative costs covered by the Contractor's fee.

2. The cost of purchasing, renting, or furnishing small tools and hand tools.

3. Expenses of Contractor's principal and branch offices other than Contractor's office at the Site.

4. Any part of Contractor's capital expenses, including interest on Contractor's capital employed for the Work and charges against Contractor for delinquent payments.

5. 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.

6. Expenses incurred in preparing and advancing Claims.

7. Other overhead or general expense costs of any kind and the costs of any item not specifically and expressly included in Paragraph 13.01.B.

D. *Contractor's Fee*

1. When the Work as a whole is performed on the basis of cost-plus-a-fee, then:

a. Contractor's fee for the Work set forth in the Contract Documents as of the Effective Date of the Contract will be determined as set forth in the Agreement.

b. for any Work covered by a Change Order, Change Proposal, Claim, set-off, or other adjustment in Contract Price on the basis of Cost of the Work, Contractor's fee will be determined as follows:

1) When the fee for the Work as a whole is a percentage of the Cost of the Work, the fee will automatically adjust as the Cost of the Work changes.

2) When the fee for the Work as a whole is a fixed fee, the fee for any additions or deletions will be determined in accordance with Paragraph 11.07.C.2.

2. When the Work as a whole is performed on the basis of a stipulated sum, or any other basis other than cost-plus-a-fee, then Contractor's fee for any Work covered by a Change

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Order, Change Proposal, Claim, set-off, or other adjustment in Contract Price on the basis of Cost of the Work will be determined in accordance with Paragraph 11.07.C.2.

E. *Documentation and Audit*: Whenever the Cost of the Work for any purpose is to be determined pursuant to this Article 13, Contractor and pertinent Subcontractors will establish and maintain records of the costs in accordance with generally accepted accounting practices. Subject to prior written notice, Owner will be afforded reasonable access, during normal business hours, to all Contractor's accounts, records, books, correspondence, instructions, drawings, receipts, vouchers, memoranda, and similar data relating to the Cost of the Work and Contractor's fee. Contractor shall preserve all such documents for a period of three years after the final payment by Owner. Pertinent Subcontractors will afford such access to Owner, and preserve such documents, to the same extent required of Contractor.

13.02 *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*: Contractor agrees that:

1. 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

2. 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 for any of the foregoing will be valid.

C. *Owner's Contingency Allowance*: Contractor agrees that an Owner's 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 for Work covered by allowances, and the Contract Price will be correspondingly adjusted.

13.03 *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. Payments to Contractor for Unit Price Work will be based on actual quantities.

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. 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

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thereon will be final and binding (except as modified by Engineer to reflect changed factual conditions or more accurate data) upon Owner and Contractor, and the final adjustment of Contract Price will be set forth in a Change Order, subject to the provisions of the following paragraph.

E. *Adjustments in Unit Price*

1. Contractor or Owner shall be entitled to an adjustment in the unit price with respect to an item of Unit Price Work if:

a. the quantity of the item of Unit Price Work performed by Contractor differs materially and significantly from the estimated quantity of such item indicated in the Agreement; and

b. Contractor's unit costs to perform the item of Unit Price Work have changed materially and significantly as a result of the quantity change.

2. The adjustment in unit price will account for and be coordinated with any related changes in quantities of other items of Work, and in Contractor's costs to perform such other Work, such that the resulting overall change in Contract Price is equitable to Owner and Contractor.

3. Adjusted unit prices will apply to all units of that item.

ARTICLE 14—TESTS AND INSPECTIONS; CORRECTION, REMOVAL, OR ACCEPTANCE OF DEFECTIVE WORK

14.01 *Access to Work*

A. Owner, Engineer, their consultants and other representatives and personnel of Owner, independent testing laboratories, and authorities having jurisdiction 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 with such procedures and programs as applicable.

14.02 *Tests, Inspections, and Approvals*

A. Contractor shall give Engineer timely notice of readiness of the Work (or specific parts thereof) for all required inspections and tests, and shall cooperate with inspection and testing personnel to facilitate required inspections and tests.

B. Owner shall retain and pay for the services of an independent inspector, testing laboratory, or other qualified individual or entity to perform all inspections and tests expressly required by the Contract Documents to be furnished and paid for by Owner, except that costs incurred in connection with tests or inspections of covered Work will be governed by the provisions of Paragraph 14.05.

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.

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D. Contractor shall be responsible for arranging, obtaining, and paying for all inspections and tests required:

1. by the Contract Documents, unless the Contract Documents expressly allocate responsibility for a specific inspection or test to Owner;

2. to attain Owner's and Engineer's acceptance of materials or equipment to be incorporated in the Work;

3. by manufacturers of equipment furnished under the Contract Documents;

4. for testing, adjusting, and balancing of mechanical, electrical, and other equipment to be incorporated into the Work; and

5. for acceptance of materials, mix designs, or equipment submitted for approval prior to Contractor's purchase thereof for incorporation in the Work.

Such inspections and tests will be performed by independent inspectors, testing laboratories, or other qualified individuals or entities acceptable to Owner and Engineer.

E. If the Contract Documents require the Work (or part thereof) to be approved by Owner, Engineer, or another designated individual or entity, then Contractor shall assume full responsibility for arranging and obtaining such approvals.

F. 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. Such uncovering will be at Contractor's expense unless Contractor had given Engineer timely notice of Contractor's intention to cover the same and Engineer had not acted with reasonable promptness in response to such notice.

14.03 *Defective Work*

A. *Contractor's Obligation*: It is Contractor's obligation to assure that the Work is not defective.

B. *Engineer's Authority*: Engineer has the authority to determine whether Work is defective, and to reject defective Work.

C. *Notice of Defects*: Prompt written notice of all defective Work of which Owner or Engineer has actual knowledge will be given to Contractor.

D. *Correction, or Removal and Replacement*: Promptly after receipt of written notice of defective Work, Contractor shall correct all such defective Work, whether or not fabricated, installed, or completed, or, if Engineer has rejected the defective Work, remove it from the Project and replace it with Work that is not defective.

E. *Preservation of Warranties*: When correcting defective Work, Contractor shall take no action that would void or otherwise impair Owner's special warranty and guarantee, if any, on said Work.

F. *Costs and Damages*: In addition to its correction, removal, and replacement obligations with respect to defective Work, Contractor shall pay all claims, costs, losses, and damages arising out of or relating to defective Work, including but not limited to the cost of the inspection, testing, correction, removal, replacement, or reconstruction of such defective Work, fines levied against Owner by governmental authorities because the Work is defective, and the costs of repair or replacement of work of others resulting from defective Work. Prior to final payment, if Owner and Contractor are unable to agree as to the measure of such claims, costs,

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losses, and damages resulting from defective Work, then Owner may impose a reasonable set-off against payments due under Article 15.

14.04 *Acceptance of Defective Work*

A. If, instead of requiring correction or removal and replacement of defective Work, Owner prefers to accept it, Owner may do so (subject, if such acceptance occurs prior to final payment, to Engineer's confirmation that such acceptance is in general accord with the design intent and applicable engineering principles, and will not endanger public safety). Contractor shall pay all claims, costs, losses, and damages 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. If any such acceptance occurs prior to final payment, the necessary revisions in the Contract Documents with respect to the Work will be incorporated in a Change Order. If the parties are unable to agree as to the decrease in the Contract Price, reflecting the diminished value of Work so accepted, then Owner may impose a reasonable set-off against payments due under Article 15. If the acceptance of defective Work occurs after final payment, Contractor shall pay an appropriate amount to Owner.

14.05 *Uncovering Work*

A. Engineer has the authority to require additional inspection or testing of the Work, whether or not the Work is fabricated, installed, or completed.

B. If any Work is covered contrary to the written request of Engineer, then Contractor shall, if requested by Engineer, uncover such Work for Engineer's observation, and then replace the covering, all at Contractor's expense.

C. If Engineer considers it necessary or advisable that covered Work be observed by Engineer or inspected or tested by others, then 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, and provide all necessary labor, material, and equipment.

1. If it is found that the uncovered Work is defective, Contractor shall be responsible for all claims, costs, losses, and damages 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 pending Contractor's full discharge of this responsibility the Owner shall be entitled to impose a reasonable set-off against payments due under Article 15.

2. 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, 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, then Contractor may submit a Change Proposal within 30 days of the determination that the Work is not defective.

14.06 *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, then Owner may order Contractor to stop the Work,

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or any portion thereof, until the cause for such order has been eliminated; however, this right of Owner to stop the Work will 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.

14.07 *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 defective Work as required by Engineer, then Owner may, after 7 days' written notice to Contractor, correct or remedy any such deficiency.

B. In exercising the rights and remedies under this Paragraph 14.07, 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, 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 incurred or sustained by Owner in exercising the rights and remedies under this Paragraph 14.07 will be charged against Contractor as set-offs against payments due under Article 15. 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 14.07.

ARTICLE 15—PAYMENTS TO CONTRACTOR; SET-OFFS; COMPLETION; CORRECTION PERIOD

15.01 *Progress Payments*

A. *Basis for Progress Payments*: The Schedule of Values established as provided in Article 2 will serve as the basis for progress payments and will be incorporated into a form of Application for Payment acceptable to Engineer. Progress payments for Unit Price Work will be based on the number of units completed during the pay period, as determined under the provisions of Paragraph 13.03. Progress payments for cost-based Work will be based on Cost of the Work completed by Contractor during the pay period.

B. *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.

2. 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 must also be accompanied by: (a) a bill of sale, invoice, copies of subcontract or purchase order payments, or other documentation

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establishing full payment by Contractor for the materials and equipment; (b) at Owner's request, documentation warranting that Owner has received the materials and equipment free and clear of all Liens; and (c) evidence that the materials and equipment are covered by appropriate property insurance, a warehouse bond, or other arrangements to protect Owner's interest therein, all of which must be satisfactory to Owner.

3. Beginning with the second Application for Payment, each Application must include an affidavit of Contractor stating that all previous progress payments received by Contractor have been applied to discharge Contractor's legitimate obligations associated with prior Applications for Payment.

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

C. *Review of Applications*

1. Engineer will, within 10 days after receipt of each Application for Payment, including each resubmittal, 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 13.03, 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; 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.

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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;

    b. for the means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto;

    c. for Contractor's failure to comply with Laws and Regulations applicable to Contractor's performance of the Work;

    d. to make any examination to ascertain how or for what purposes Contractor has used the money paid by Owner; 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 15.01.C.2.

6. Engineer will recommend reductions in payment (set-offs) necessary in Engineer's opinion to protect Owner from loss because:

    a. the Work is defective, requiring correction or replacement;

    b. the Contract Price has been reduced by Change Orders;

    c. Owner has been required to correct defective Work in accordance with Paragraph 14.07, or has accepted defective Work pursuant to Paragraph 14.04;

    d. Owner has been required to remove or remediate a Hazardous Environmental Condition for which Contractor is responsible; or

    e. Engineer has actual knowledge of the occurrence of any of the events that would constitute a default by Contractor and therefore justify termination for cause under the Contract Documents.

D. *Payment Becomes Due*

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

E. *Reductions in Payment by Owner*

1. In addition to any reductions in payment (set-offs) recommended by Engineer, Owner is entitled to impose a set-off against payment based on any of the following:

    a. Claims have been made against Owner based on Contractor's conduct in the performance or furnishing of the Work, or Owner has incurred costs, losses, or damages resulting from Contractor's conduct in the performance or furnishing of the Work, including but not limited to claims, costs, losses, or damages from workplace injuries, adjacent property damage, non-compliance with Laws and Regulations, and patent infringement;

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b. Contractor has failed to take reasonable and customary measures to avoid damage, delay, disruption, and interference with other work at or adjacent to the Site;

c. Contractor has failed to provide and maintain required bonds or insurance;

d. Owner has been required to remove or remediate a Hazardous Environmental Condition for which Contractor is responsible;

e. Owner has incurred extra charges or engineering costs related to submittal reviews, evaluations of proposed substitutes, tests and inspections, or return visits to manufacturing or assembly facilities;

f. The Work is defective, requiring correction or replacement;

g. Owner has been required to correct defective Work in accordance with Paragraph 14.07, or has accepted defective Work pursuant to Paragraph 14.04;

h. The Contract Price has been reduced by Change Orders;

i. An event has occurred that would constitute a default by Contractor and therefore justify a termination for cause;

j. Liquidated or other damages have accrued as a result of Contractor's failure to achieve Milestones, Substantial Completion, or final completion of the Work;

k. 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; or

l. Other items entitle Owner to a set-off against the amount recommended.

2. If Owner imposes any set-off against payment, whether based on its own knowledge or on the written recommendations of Engineer, Owner will give Contractor immediate written notice (with a copy to Engineer) stating the reasons for such action and the specific amount of the reduction, 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, if Contractor remedies the reasons for such action. The reduction imposed will be binding on Contractor unless it duly submits a Change Proposal contesting the reduction.

3. Upon a subsequent determination that Owner's refusal of payment was not justified, the amount wrongfully withheld will be treated as an amount due as determined by Paragraph 15.01.D.1 and subject to interest as provided in the Agreement.

15.02 *Contractor's Warranty of Title*

A. Contractor warrants and guarantees that title to all Work, materials, and equipment furnished under the Contract will pass to Owner free and clear of (1) all Liens and other title defects, and (2) all patent, licensing, copyright, or royalty obligations, no later than 7 days after the time of payment by Owner.

15.03 *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 and request that Engineer issue a certificate of Substantial Completion. Contractor shall at the same time

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submit to Owner and Engineer an initial draft of punch list items to be completed or corrected before final payment.

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 preliminary certificate of Substantial Completion which will fix the date of Substantial Completion. Engineer shall attach to the certificate a punch list of items to be completed or corrected before final payment. Owner shall have 7 days after receipt of the preliminary certificate during which to make written objection to Engineer as to any provisions of the certificate or attached punch list. If, after considering the objections to the provisions of the preliminary certificate, Engineer concludes that the Work is not substantially complete, Engineer will, within 14 days after submission of the preliminary certificate to Owner, notify Contractor in writing that the Work is not substantially complete, stating the reasons therefor. If Owner does not object to the provisions of the certificate, or if despite consideration of Owner's objections Engineer concludes that the Work is substantially complete, then Engineer will, within said 14 days, execute and deliver to Owner and Contractor a final certificate of Substantial Completion (with a revised punch list of items to be completed or corrected) reflecting such changes from the preliminary certificate as Engineer believes justified after consideration of any objections from Owner.

D. At the time of receipt of the preliminary certificate of Substantial Completion, Owner and Contractor will confer regarding Owner's use or occupancy of the Work following Substantial Completion, review the builder's risk insurance policy with respect to the end of the builder's risk coverage, and confirm the transition to coverage of the Work under a permanent property insurance policy held by Owner. Unless Owner and Contractor agree otherwise in writing, Owner shall bear responsibility for security, operation, protection of the Work, property insurance, maintenance, heat, and utilities upon Owner's use or occupancy of the Work.

E. After Substantial Completion the Contractor shall promptly begin work on the punch list of items to be completed or corrected prior to final payment. In appropriate cases Contractor may submit monthly Applications for Payment for completed punch list items, following the progress payment procedures set forth above.

F. 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 punch list.

15.04 *Partial Use or Occupancy*

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:

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1. At any time, Owner may request in writing that Contractor permit Owner to use or occupy any such part of the Work that Owner believes to be 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 15.03.A through 15.03.E for that part of the Work.

2. At any time, Contractor may notify Owner and Engineer in writing that Contractor considers any such part of the Work 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 15.03 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 6.04 regarding builder's risk or other property insurance.

15.05 *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, or agreed portion thereof, is incomplete or defective. Contractor shall immediately take such measures as are necessary to complete such Work or remedy such deficiencies.

15.06 *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, annotated record documents (as provided in Paragraph 7.12), and other documents, Contractor may make application for final payment.

2. The final Application for Payment must be accompanied (except as previously delivered) by:

a. all documentation called for in the Contract Documents;

b. consent of the surety, if any, to final payment;

c. satisfactory evidence that all title issues have been resolved such that title to all Work, materials, and equipment has passed to Owner free and clear of any Liens or other title defects, or will so pass upon final payment.

d. a list of all duly pending Change Proposals and Claims; and

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e. complete and legally effective releases or waivers (satisfactory to Owner) of all Lien rights arising out of the Work, and of Liens filed in connection with the Work.

3. In lieu of the releases or waivers of Liens specified in Paragraph 15.06.A.2 and as approved by Owner, Contractor may furnish receipts or releases in full and an affidavit of Contractor that: (a) the releases and receipts include all labor, services, material, and equipment for which a Lien could be filed; and (b) 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, or Owner at its option may issue joint checks payable to Contractor and specified Subcontractors and Suppliers.

B. *Engineer's Review of Final Application and Recommendation of Payment*: 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 have been fulfilled, Engineer will, within 10 days after receipt of the final Application for Payment, indicate in writing Engineer's recommendation of final payment and present the final Application for Payment to Owner for payment. Such recommendation will account for any set-offs against payment that are necessary in Engineer's opinion to protect Owner from loss for the reasons stated above with respect to progress payments. 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. *Notice of Acceptability*: In support of its recommendation of payment of the final Application for Payment, Engineer will also give written notice to Owner and Contractor that the Work is acceptable, subject to stated limitations in the notice and to the provisions of Paragraph 15.07.

D. *Completion of Work*: The Work is complete (subject to surviving obligations) when it is ready for final payment as established by the Engineer's written recommendation of final payment and issuance of notice of the acceptability of the Work.

E. *Final Payment Becomes Due*: Upon receipt from Engineer of the final Application for Payment and accompanying documentation, Owner shall set off against the amount recommended by Engineer for final payment any further sum to which Owner is entitled, including but not limited to set-offs for liquidated damages and set-offs allowed under the provisions of this Contract with respect to progress payments. Owner shall pay the resulting balance due to Contractor within 30 days of Owner's receipt of the final Application for Payment from Engineer.

15.07 *Waiver of Claims*

A. By making final payment, Owner waives its claim or right to liquidated damages or other damages for late completion by Contractor, except as set forth in an outstanding Claim, appeal under the provisions of Article 17, set-off, or express reservation of rights by Owner. Owner reserves all other claims or rights after final payment.

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B. The acceptance of final payment by Contractor will constitute a waiver by Contractor of all claims and rights against Owner other than those pending matters that have been duly submitted as a Claim, or appealed under the provisions of Article 17.

15.08 *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 Supplementary Conditions or the terms of any applicable special guarantee required by the Contract Documents), Owner gives Contractor written notice that any Work has been found to be defective, or that Contractor's repair of any damages to the Site or adjacent areas has been found to be defective, then after receipt of such notice of defect Contractor shall promptly, without cost to Owner and in accordance with Owner's written instructions:

1. correct the defective repairs to the Site or such adjacent areas;
2. correct such defective Work;
3. remove the defective Work from the Project and replace it with Work that is not defective, if the defective Work has been rejected by Owner, and
4. satisfactorily correct or repair or remove and replace any damage to other Work, to the work of others, or to other land or areas resulting from the corrective measures.

B. Owner shall give any such notice of defect within 60 days of the discovery that such Work or repairs is defective. If such notice is given within such 60 days but after the end of the correction period, the notice will be deemed a notice of defective Work under Paragraph 7.17.B.

C. If, after receipt of a notice of defect within 60 days and within the correction period, 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. Contractor shall pay all 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). Contractor's failure to pay such costs, losses, and damages within 10 days of invoice from Owner will be deemed the start of an event giving rise to a Claim under Paragraph 12.01.B, such that any related Claim must be brought within 30 days of the failure to pay.

D. 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.

E. Where defective Work (and damage to other Work resulting therefrom) has been corrected or removed and replaced under this paragraph, 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.

F. Contractor's obligations under this paragraph are in addition to all other obligations and warranties. The provisions of this paragraph are not to be construed as a substitute for, or a waiver of, the provisions of any applicable statute of limitation or repose.

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ARTICLE 16—SUSPENSION OF WORK AND TERMINATION

16.01 *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 written notice to Contractor and Engineer. Such notice will fix the date on which Work will be resumed. Contractor shall resume the Work on the date so fixed. Contractor shall be entitled to an adjustment in the Contract Price or an extension of the Contract Times directly attributable to any such suspension. Any Change Proposal seeking such adjustments must be submitted no later than 30 days after the date fixed for resumption of Work.

16.02 *Owner May Terminate for Cause*

A. The occurrence of any one or more of the following events will constitute a default by Contractor and 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);

2. Failure of Contractor to perform or otherwise to comply with a material term of the Contract Documents;

3. Contractor's disregard of Laws or Regulations of any public body having jurisdiction; or

4. Contractor's repeated disregard of the authority of Owner or Engineer.

B. If one or more of the events identified in Paragraph 16.02.A occurs, then after giving Contractor (and any surety) 10 days' written notice that Owner is considering a declaration that Contractor is in default and termination of the Contract, Owner may proceed to:

1. declare Contractor to be in default, and give Contractor (and any surety) written notice that the Contract is terminated; and

2. enforce the rights available to Owner under any applicable performance bond.

C. Subject to the terms and operation of any applicable performance bond, if Owner has terminated the Contract for cause, Owner may exclude Contractor from the Site, take possession of the Work, 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 complete the Work as Owner may deem expedient.

D. Owner may not proceed with termination of the Contract under Paragraph 16.02.B if Contractor within 7 days of receipt of notice of intent to terminate begins to correct its failure to perform and proceeds diligently to cure such failure.

E. If Owner proceeds as provided in Paragraph 16.02.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 the cost to complete the Work, including all related claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals) sustained by Owner, such excess will be paid to Contractor. If the cost to complete the Work including such related claims, costs, losses, and damages exceeds 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

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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.

F. 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, or any rights or remedies of Owner against Contractor or any surety under any payment bond or performance bond. Any retention or payment of money due Contractor by Owner will not release Contractor from liability.

G. If and to the extent that Contractor has provided a performance bond under the provisions of Paragraph 6.01.A, the provisions of that bond will govern over any inconsistent provisions of Paragraphs 16.02.B and 16.02.D.

16.03 *Owner May Terminate for Convenience*

A. Upon 7 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; and

3. other reasonable expenses directly attributable to termination, including costs incurred to prepare a termination for convenience cost proposal.

B. Contractor shall not be paid for any loss of anticipated profits or revenue, post-termination overhead costs, or other economic loss arising out of or resulting from such termination.

16.04 *Contractor May Stop Work or Terminate*

A. If, through no act or fault of Contractor, (1) the Work is suspended for more than 90 consecutive days by Owner or under an order of court or other public authority, or (2) Engineer fails to act on any Application for Payment within 30 days after it is submitted, or (3) Owner fails for 30 days to pay Contractor any sum finally determined to be due, then Contractor may, upon 7 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 16.03.

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, 7 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 are not intended to preclude Contractor from submitting a Change Proposal 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.

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ARTICLE 17—FINAL RESOLUTION OF DISPUTES

17.01 *Methods and Procedures*

A. *Disputes Subject to Final Resolution*: The following disputed matters are subject to final resolution under the provisions of this article:

1. A timely appeal of an approval in part and denial in part of a Claim, or of a denial in full, pursuant to Article 12; and

2. Disputes between Owner and Contractor concerning the Work, or obligations under the Contract Documents, that arise after final payment has been made.

B. *Final Resolution of Disputes*: For any dispute subject to resolution under this article, Owner or Contractor may:

1. elect in writing to invoke the dispute resolution process provided for in the Supplementary Conditions;

2. agree with the other party to submit the dispute to another dispute resolution process; or

3. if no dispute resolution process is provided for in the Supplementary Conditions or mutually agreed to, give written notice to the other party of the intent to submit the dispute to a court of competent jurisdiction.

ARTICLE 18—MISCELLANEOUS

18.01 *Giving Notice*

A. Whenever any provision of the Contract requires the giving of written notice to Owner, Engineer, or Contractor, it will be deemed to have been validly given only if delivered:

1. in person, by a commercial courier service or otherwise, to the recipient's place of business;

2. by registered or certified mail, postage prepaid, to the recipient's place of business; or

3. by e-mail to the recipient, with the words "Formal Notice" or similar in the e-mail's subject line.

18.02 *Computation of Times*

A. When any period of time is referred to in the Contract 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.

18.03 *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. The provisions of this paragraph will be as effective as if

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repeated specifically in the Contract Documents in connection with each particular duty, obligation, right, and remedy to which they apply.

18.04 *Limitation of Damages*

A. With respect to any and all Change Proposals, Claims, disputes subject to final resolution, and other matters at issue, neither Owner nor Engineer, nor any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors, shall be liable to Contractor for any claims, costs, losses, or damages sustained by Contractor on or in connection with any other project or anticipated project.

18.05 *No Waiver*

A. A party's non-enforcement of any provision will not constitute a waiver of that provision, nor will it affect the enforceability of that provision or of the remainder of this Contract.

18.06 *Survival of Obligations*

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

18.07 *Controlling Law*

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

18.08 *Assignment of Contract*

A. Unless expressly agreed to elsewhere in the Contract, no assignment by a party to this Contract of any rights under or interests in the Contract will be binding on the other party without the written consent of the party sought to be bound; and, specifically but without limitation, money that may become due and money that is 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.

18.09 *Successors and Assigns*

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

18.10 *Headings*

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

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SUPPLEMENTARY CONDITIONS OF THE CONSTRUCTION CONTRACT

These Supplementary Conditions amend or supplement EJCDC® C-700, Standard General Conditions of the Construction Contract (2018). The General Conditions remain in full force and effect except as amended.

The terms used in these Supplementary Conditions have the meanings stated in the General Conditions. Additional terms used in these Supplementary Conditions have the meanings stated below, which are applicable to both the singular and plural thereof.

The address system used in these Supplementary Conditions is the same as the address system used in the General Conditions, with the prefix "SC" added—for example, “Paragraph SC-4.05.”

ARTICLE 1—DEFINITIONS AND TERMINOLOGY

No suggested Supplementary Conditions in this Article.

ARTICLE 2—PRELIMINARY MATTERS

2.01 *Delivery of Bonds and Evidence of Insurance*

SC-2.01 Delete Paragraphs 2.01.B. and C. in their entirety and insert the following in their place:

B. *Evidence of Contractor’s Insurance:* When Contractor delivers the signed counterparts of the Agreement to Owner, Contractor shall also deliver to Owner copies of the policies (including all endorsements, and identification of applicable self-insured retentions and deductibles) of insurance required to be provided by Contractor in this Contract. Contractor may block out (redact) any confidential premium or pricing information contained in any policy or endorsement furnished under this provision.

C. *Evidence of Owner’s Insurance:* After receipt from Contractor of the signed counterparts of the Agreement and all required bonds and insurance documentation, Owner shall promptly deliver to Contractor copies of the policies of insurance to be provided by Owner in this Contract (if any). Owner may block out (redact) any confidential premium or pricing information contained in any policy or endorsement furnished under this provision.

2.02 *Copies of Documents*

SC-2.02 Amend the first sentence of Paragraph 2.02.A. to read as follows:

Owner shall furnish to Contractor **1** printed copies of the Contract Documents (including one fully signed counterpart of the Agreement), and **one copy** in electronic portable document format (PDF).

SC-2.02 Delete Paragraph 2.02.A in its entirety and insert the following new paragraph in its place:

A. Owner shall furnish to Contractor **1** printed copies of conformed Contract Documents incorporating and integrating all Addenda and any amendments negotiated prior to the Effective Date of the Contract (including one fully signed counterpart of the Agreement), and one copy in electronic portable document format (PDF). Additional printed copies of the conformed Contract Documents will be furnished upon request at the cost of reproduction.

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2.06 *Electronic Transmittals*

SC-2.06 Delete Paragraphs 2.06.B and 2.06.C in their entirety and insert the following in their place:

B. *Electronic Documents Protocol:* The parties shall conform to the following provisions in Paragraphs 2.06.B and 2.06.C, together referred to as the Electronic Documents Protocol ("EDP" or "Protocol") for exchange of electronic transmittals.

1. *Basic Requirements*

a. To the fullest extent practical, the parties agree to and will transmit and accept Electronic Documents in an electronic or digital format using the procedures described in this Protocol. Use of the Electronic Documents and any information contained therein is subject to the requirements of this Protocol and other provisions of the Contract.

b. The contents of the information in any Electronic Document will be the responsibility of the transmitting party.

c. Electronic Documents as exchanged by this Protocol may be used in the same manner as the printed versions of the same documents that are exchanged using non-electronic format and methods, subject to the same governing requirements, limitations, and restrictions, set forth in the Contract Documents.

d. Except as otherwise explicitly stated herein, the terms of this Protocol will be incorporated into any other agreement or subcontract between a party and any third party for any portion of the Work on the Project, or any Project-related services, where that third party is, either directly or indirectly, required to exchange Electronic Documents with a party or with Engineer. Nothing herein will modify the requirements of the Contract regarding communications between and among the parties and their subcontractors and consultants.

e. When transmitting Electronic Documents, the transmitting party makes no representations as to long term compatibility, usability, or readability of the items resulting from the receiving party's use of software application packages, operating systems, or computer hardware differing from those established in this Protocol.

f. Nothing herein negates any obligation 1) in the Contract to create, provide, or maintain an original printed record version of Drawings and Specifications, signed and sealed according to applicable Laws and Regulations; 2) to comply with any applicable Law or Regulation governing the signing and sealing of design documents or the signing and electronic transmission of any other documents; or 3) to comply with the notice requirements of Paragraph 18.01 of the General Conditions.

2. *System Infrastructure for Electronic Document Exchange*

a. Each party will provide hardware, operating system(s) software, internet, e-mail, and large file transfer functions ("System Infrastructure") at its own cost and sufficient for complying with the EDP requirements. With the exception of minimum standards set forth in this EDP, and any explicit system requirements specified by attachment to this EDP, it is the obligation of each party to determine, for itself, its own System Infrastructure.

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1) The maximum size of an email attachment for exchange of Electronic Documents under this EDP is **[number]** MB. Attachments larger than that may be exchanged using large file transfer functions or physical media.

2) Each Party assumes full and complete responsibility for any and all of its own costs, delays, deficiencies, and errors associated with converting, translating, updating, verifying, licensing, or otherwise enabling its System Infrastructure, including operating systems and software, for use with respect to this EDP.

b. Each party is responsible for its own system operations, security, back-up, archiving, audits, printing resources, and other Information Technology ("IT") for maintaining operations of its System Infrastructure during the Project, including coordination with the party's individual(s) or entity responsible for managing its System Infrastructure and capable of addressing routine communications and other IT issues affecting the exchange of Electronic Documents.

c. Each party will operate and maintain industry-standard, industry-accepted, ISO-standard, commercial-grade security software and systems that are intended to protect the other party from: software viruses and other malicious software like worms, trojans, adware; data breaches; loss of confidentiality; and other threats in the transmission to or storage of information from the other parties, including transmission of Electronic Documents by physical media such as CD/DVD/flash drive/hard drive. To the extent that a party maintains and operates such security software and systems, it shall not be liable to the other party for any breach of system security.

d. In the case of disputes, conflicts, or modifications to the EDP required to address issues affecting System Infrastructure, the parties shall cooperatively resolve the issues; but, failing resolution, the Owner is authorized to make and require reasonable and necessary changes to the EDP to effectuate its original intent. If the changes cause additional cost or time to Contractor, not reasonably anticipated under the original EDP, Contractor may seek an adjustment in price or time under the appropriate process in the Contract.

e. Each party is responsible for its own back-up and archive of documents sent and received during the term of the contract under this EDP, unless this EDP establishes a Project document archive, either as part of a mandatory Project website or other communications protocol, upon which the parties may rely for document archiving during the specified term of operation of such Project document archive. Further, each party remains solely responsible for its own post-Project back-up and archive of Project documents after the term of the Contract, or after termination of the Project document archive, if one is established, for as long as required by the Contract and as each party deems necessary for its own purposes.

f. If a receiving party receives an obviously corrupted, damaged, or unreadable Electronic Document, the receiving party will advise the sending party of the incomplete transmission.

g. The parties will bring any non-conforming Electronic Documents into compliance with the EDP. The parties will attempt to complete a successful transmission of the

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Electronic Document or use an alternative delivery method to complete the communication.

h. The Owner will operate a Project information management system (also referred to in this EDP as "Project Website") for use of Owner, Engineer and Contractor during the Project for exchange and storage of Project-related communications and information. Except as otherwise provided in this EDP or the General Conditions, use of the Project Website by the parties as described in this Paragraph will be mandatory for exchange of Project documents, communications, submittals, and other Project-related information. The following conditions and standards will govern use of the Project Website:

1) Describe the period of time during which the Project Website will be operated and be available for reliance by the parties;

2) Provide any minimum system infrastructure, software licensing and security standards for access to and use of the Project Website;

3) Describe the types and extent of services to be provided at the Project Website (such as large file transfer, email, communication and document archives, etc.); and

4) Include any other Project Website attributes that may be pertinent to Contractor's use of the facility and pricing of such use.

C. *Software Requirements for Electronic Document Exchange; Limitations*

1. Each party will acquire the software and software licenses necessary to create and transmit Electronic Documents and to read and to use any Electronic Documents received from the other party (and if relevant from third parties), using the software formats required in this section of the EDP.

a. Prior to using any updated version of the software required in this section for sending Electronic Documents to the other party, the originating party will first notify and receive concurrence from the other party for use of the updated version or adjust its transmission to comply with this EDP.

2. The parties agree not to intentionally edit, reverse engineer, decrypt, remove security or encryption features, or convert to another format for modification purposes any Electronic Document or information contained therein that was transmitted in a software data format, including Portable Document Format (PDF), intended by sender not to be modified, unless the receiving party obtains the permission of the sending party or is citing or quoting excerpts of the Electronic Document for Project purposes.

3. Software and data formats for exchange of Electronic Documents will conform to the requirements set forth in Exhibit A to this EDP, including software versions, if listed.

SC-2.06 Supplement Paragraph 2.06 of the General Conditions by adding the following paragraph:

D. *Requests by Contractor for Electronic Documents in Other Formats*

1. Release of any Electronic Document versions of the Project documents in formats other than those identified in the Electronic Documents Protocol (if any) or elsewhere in the Contract will be at the sole discretion of the Owner.

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2. To extent determined by Owner, in its sole discretion, to be prudent and necessary, release of Electronic Documents versions of Project documents and other Project information requested by Contractor ("Request") in formats other than those identified in the Electronic Documents Protocol (if any) or elsewhere in the Contract will be subject to the provisions of the Owner's response to the Request, and to the following conditions to which Contractor agrees:

    a. The content included in the Electronic Documents created by Engineer and covered by the Request was prepared by Engineer as an internal working document for Engineer's purposes solely, and is being provided to Contractor on an "AS IS" basis without any warranties of any kind, including, but not limited to any implied warranties of fitness for any purpose. As such, Contractor is advised and acknowledges that the content may not be suitable for Contractor's application, or may require substantial modification and independent verification by Contractor. The content may include limited resolution of models, not-to-scale schematic representations and symbols, use of notes to convey design concepts in lieu of accurate graphics, approximations, graphical simplifications, undocumented intermediate revisions, and other devices that may affect subsequent reuse.

    b. Electronic Documents containing text, graphics, metadata, or other types of data that are provided by Engineer to Contractor under the request are only for convenience of Contractor. Any conclusion or information obtained or derived from such data will be at the Contractor's sole risk and the Contractor waives any claims against Engineer or Owner arising from use of data in Electronic Documents covered by the Request.

    c. Contractor shall indemnify and hold harmless Owner and Engineer and their subconsultants from all claims, damages, losses, and expenses, including attorneys' fees and defense costs arising out of or resulting from Contractor's use, adaptation, or distribution of any Electronic Documents provided under the Request.

    d. Contractor agrees not to sell, copy, transfer, forward, give away or otherwise distribute this information (in source or modified file format) to any third party without the direct written authorization of Engineer, unless such distribution is specifically identified in the Request and is limited to Contractor's subcontractors. Contractor warrants that subsequent use by Contractor's subcontractors complies with all terms of the Contract Documents and Owner's response to Request.

3. In the event that Owner elects to provide or directs the Engineer to provide to Contractor any Contractor-requested Electronic Document versions of Project information that is not explicitly identified in the Contract Documents as being available to Contractor, the Owner shall be reimbursed by Contractor on an hourly basis (at $**[number]** per hour) for any engineering costs necessary to create or otherwise prepare the data in a manner deemed appropriate by Engineer.

ARTICLE 3—CONTRACT DOCUMENTS: INTENT, REQUIREMENTS, REUSE

3.01 *Intent*

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SC-3.01 Delete Paragraph 3.01.C in its entirety.

ARTICLE 4—COMMENCEMENT AND PROGRESS OF THE WORK

4.05 *Delays in Contractor's Progress*

SC-4.05 Amend Paragraph 4.05.C by adding the following subparagraphs:

5. *Weather-Related Delays*

a. If "abnormal weather conditions" as set forth in Paragraph 4.05.C.2 of the General Conditions are the basis for a request for an equitable adjustment in the Contract Times, such request must be documented by data substantiating each of the following: 1) that weather conditions were abnormal for the period of time in which the delay occurred, 2) that such weather conditions could not have been reasonably anticipated, and 3) that such weather conditions had an adverse effect on the Work as scheduled.

b. The existence of abnormal weather conditions will be determined on a month-by-month basis in accordance with the following:

1) Every workday on which one or more of the following conditions exist will be considered a "bad weather day":

i) Total precipitation (as rain equivalent) occurring between 7:00 p.m. on the preceding day (regardless of whether such preceding day is a workday) through 7:00 p.m. on the workday in question equals or exceeds **.5"** of precipitation (as rain equivalent, based on the snow/rain conversion indicated in the table entitled Foreseeable Bad Weather Days; such table is hereby incorporated in this SC-4.05.C by reference.

ii) Ambient outdoor air temperature at 11:00 a.m. is equal to or less than the following low temperature threshold: **40** degrees Fahrenheit; or, at 3:00 p.m. the ambient outdoor temperature is equal to or greater than the following high temperature threshold: **100** degrees Fahrenheit.

2) Determination of actual bad weather days during performance of the Work will be based on the weather records measured and recorded by **National Weather Service** weather monitoring station at **Jamestown Municipal Airport**.

3) Contractor shall anticipate the number of foreseeable bad weather days per month indicated in the table in Exhibit **B** —Foreseeable Bad Weather Days.

4) In each month, every bad weather day exceeding the number of foreseeable bad weather days established in the table in Exhibit **B**—Foreseeable Bad Weather Days will be considered as "abnormal weather conditions." The existence of abnormal weather conditions will not relieve Contractor of the obligation to demonstrate and document that delays caused by abnormal weather are specific to the planned work activities or that such activities thus delayed were on Contractor's then-current Progress Schedule's critical path for the Project.

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ARTICLE 5—SITE, SUBSURFACE AND PHYSICAL CONDITIONS, HAZARDOUS ENVIRONMENTAL CONDITIONS

5.03 *Subsurface and Physical Conditions*

SC-5.03 Add the following new paragraphs immediately after Paragraph 5.03.D:

E. The following table lists the reports of explorations and tests of subsurface conditions at or adjacent to the Site that contain Technical Data, and specifically identifies the Technical Data in the report upon which Contractor may rely: **[If there are no such reports, so indicate in the table.]**

Report Title	Date of Report	Technical Data
		No such reports

F. The following table lists the drawings of existing physical conditions at or adjacent to the Site, including those drawings depicting existing surface or subsurface structures at or adjacent to the Site (except Underground Facilities), that contain Technical Data, and specifically identifies the Technical Data upon which Contractor may rely: **[If there are no such drawings, so indicate in the table.]**

Drawings Title	Date of Drawings	Technical Data
		No such reports

G. Contractor may examine copies of reports and drawings identified in SC-5.03.E and SC-5.03.F that were not included with the Bidding Documents at **[location]** during regular business hours, or may request copies from Engineer.

5.06 *Hazardous Environmental Conditions*

SC-5.06 Add the following new paragraphs immediately after Paragraph 5.06.A.3:

4. The following table lists the reports known to Owner relating to Hazardous Environmental Conditions at or adjacent to the Site, and the Technical Data (if any) upon which Contractor may rely: **[If there are no such reports, so indicate in the table]**

Report Title	Date of Report	Technical Data
		No such reports

5. The following table lists the drawings known to Owner relating to Hazardous Environmental Conditions at or adjacent to the Site, and Technical Data (if any) contained in such Drawings upon which Contractor may rely: **[If there are no such drawings, so indicate in the table]**

Drawings Title	Date of Drawings	Technical Data
		No such reports

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Drawings Title	Date of Drawings	Technical Data

ARTICLE 6—BONDS AND INSURANCE

6.01 *Performance, Payment, and Other Bonds*

SC-6.01 Add the following paragraphs immediately after Paragraph 6.01.A:

1. *Required Performance Bond Form:* The performance bond that Contractor furnishes will be in the form of EJCDC® C-610, Performance Bond (2010, 2013, or 2018 edition).
2. *Required Payment Bond Form:* The payment bond that Contractor furnishes will be in the form of EJCDC® C-615, Payment Bond (2010, 2013, or 2018 edition).

SC-6.01 Add the following paragraphs immediately after Paragraph 6.01.B:

1. The correction period specified as one year after the date of Substantial Completion in Paragraph 15.08.A of the General Conditions is hereby revised to be **2** years after Substantial Completion.
2. After Substantial Completion, Contractor shall furnish a warranty bond issued in the form of EJCDC® C-612, Warranty Bond (2018). The warranty bond must be in a bond amount of **10** percent of the final Contract Price. The warranty bond period will extend to a date **2** years after Substantial Completion of the Work. Contractor shall deliver the fully executed warranty bond to Owner prior to or with the final application for payment, and in any event no later than 11 months after Substantial Completion.
3. The warranty bond must be issued by the same surety that issues the performance bond required under Paragraph 6.01.A of the General Conditions.

6.02 *Insurance—General Provisions*

SC-6.02 Add the following paragraph immediately after Paragraph 6.02.B:

1. Contractor may obtain worker's compensation insurance from an insurance company that has not been rated by A.M. Best, provided that such company (a) is domiciled in the state in which the Project is located, (b) is certified or authorized as a worker's compensation insurance provider by the appropriate state agency, and (c) has been accepted to provide worker's compensation insurance for similar projects by the state within the last 12 months.

SC-6.02 Add the following paragraph immediately after Paragraph 6.02.H.2 of the General Conditions:

3. For the following Subcontractors, Suppliers, or categories of Subcontractor or Supplier, Contractor shall require the following specified insurance, with policy limits as stated: **[Identify Subcontractors, Suppliers, or categories of same, and insert specific insurance requirements and policy limits]**

6.03 *Contractor's Insurance*

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SC-6.03 Supplement Paragraph 6.03 with the following provisions after Paragraph 6.03.C:

D. *Other Additional Insureds:* As a supplement to the provisions of Paragraph 6.03.C of the General Conditions, the commercial general liability, automobile liability, umbrella or excess, pollution liability, and unmanned aerial vehicle liability policies must include as additional insureds (in addition to Owner and Engineer) the following: **[Here list by legal name (not category, role, or classification) other persons or entities to be included as additional insureds. See GC-6.03.C.]**

E. *Workers' Compensation and Employer's Liability:* Contractor shall purchase and maintain workers' compensation and employer's liability insurance, including, as applicable, United States Longshoreman and Harbor Workers' Compensation Act, Jones Act, stop-gap employer's liability coverage for monopolistic states, and foreign voluntary workers' compensation (from available sources, notwithstanding the jurisdictional requirement of Paragraph 6.02.B of the General Conditions).

Workers' Compensation and Related Policies	Policy limits of not less than:
Workers' Compensation	
State	Statutory
Applicable Federal (e.g., Longshoreman's)	Statutory
Foreign voluntary workers' compensation (employer's responsibility coverage), if applicable	Statutory
Jones Act (if applicable)	
Bodily injury by accident—each accident	$500,000.00
Bodily injury by disease—aggregate	$500,000.00
Employer's Liability	
Each accident	$1,000,000.00
Each employee	$1,000,000.00
Policy limit	$1,000,000.00
Stop-gap Liability Coverage	
For work performed in monopolistic states, stop-gap liability coverage must be endorsed to either the worker's compensation or commercial general liability policy with a minimum limit of:	$50,000.00

F. *Commercial General Liability—Claims Covered:* Contractor shall purchase and maintain commercial general liability insurance, covering all operations by or on behalf of Contractor, on an occurrence basis, against claims for:

1. damages because of bodily injury, sickness or disease, or death of any person other than Contractor's employees,
2. damages insured by reasonably available personal injury liability coverage, and
3. damages because of injury to or destruction of tangible property wherever located, including loss of use resulting therefrom.

G. *Commercial General Liability—Form and Content:* Contractor's commercial liability policy must be written on a 1996 (or later) Insurance Services Organization, Inc. (ISO) commercial general liability form (occurrence form) and include the following coverages and endorsements:

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1. Products and completed operations coverage.
    a. Such insurance must be maintained for three years after final payment.
    b. Contractor shall furnish Owner and each other additional insured (as identified in the Supplementary Conditions or elsewhere in the Contract) evidence of continuation of such insurance at final payment and three years thereafter.
2. Blanket contractual liability coverage, including but not limited to coverage of Contractor's contractual indemnity obligations in Paragraph 7.18.
3. Severability of interests and no insured-versus-insured or cross-liability exclusions.
4. Underground, explosion, and collapse coverage.
5. Personal injury coverage.
6. Additional insured endorsements that include both ongoing operations and products and completed operations coverage through ISO Endorsements CG 20 10 10 01 and CG 20 37 10 01 (together). If Contractor demonstrates to Owner that the specified ISO endorsements are not commercially available, then Contractor may satisfy this requirement by providing equivalent endorsements.
7. For design professional additional insureds, ISO Endorsement CG 20 32 07 04 "Additional Insured—Engineers, Architects or Surveyors Not Engaged by the Named Insured" or its equivalent.

H. *Commercial General Liability—Excluded Content:* The commercial general liability insurance policy, including its coverages, endorsements, and incorporated provisions, must not include any of the following:
1. Any modification of the standard definition of "insured contract" (except to delete the railroad protective liability exclusion if Contractor is required to indemnify a railroad or others with respect to Work within 50 feet of railroad property).
2. Any exclusion for water intrusion or water damage.
3. Any provisions resulting in the erosion of insurance limits by defense costs other than those already incorporated in ISO form CG 00 01.
4. Any exclusion of coverage relating to earth subsidence or movement.
5. Any exclusion for the insured's vicarious liability, strict liability, or statutory liability (other than worker's compensation).
6. Any limitation or exclusion based on the nature of Contractor's work.
7. Any professional liability exclusion broader in effect than the most recent edition of ISO form CG 22 79.

I. *Commercial General Liability—Minimum Policy Limits*

Commercial General Liability	**Policy limits of not less than:**
General Aggregate	$3,000,000.00
Products—Completed Operations Aggregate	$3,000,000.00
Personal and Advertising Injury	$1,000,000.00

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Commercial General Liability	Policy limits of not less than:
Bodily Injury and Property Damage—Each Occurrence	$1,000,000.00

J. *Automobile Liability:* Contractor shall purchase and maintain automobile liability insurance 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. The automobile liability policy must be written on an occurrence basis.

Automobile Liability	Policy limits of not less than:
Bodily Injury	
Each Person	$2,000,000.00
Each Accident	$2,000,000.00
Property Damage	
Each Accident	$2,000,000.00
[or]	
Combined Single Limit	
Combined Single Limit (Bodily Injury and Property Damage)	$2,000,000.00

K. *Umbrella or Excess Liability:* Contractor shall purchase and maintain umbrella or excess liability insurance written over the underlying employer's liability, commercial general liability, and automobile liability insurance described in the Paragraphs above. The coverage afforded must be at least as broad as that of each and every one of the underlying policies.

Excess or Umbrella Liability	Policy limits of not less than:
Each Occurrence	$3,000,000.00
General Aggregate	$3,000,000.00

L. *Using Umbrella or Excess Liability Insurance to Meet CGL and Other Policy Limit Requirements:* Contractor may meet the policy limits specified for employer's liability, commercial general liability, and automobile liability through the primary policies alone, or through combinations of the primary insurance policy's policy limits and partial attribution of the policy limits of an umbrella or excess liability policy that is at least as broad in coverage as that of the underlying policy, as specified herein. If such umbrella or excess liability policy was required under this Contract, at a specified minimum policy limit, such umbrella or excess policy must retain a minimum limit of $**[specify amount]** after accounting for partial attribution of its limits to underlying policies, as allowed above.

M. *Contractor's Pollution Liability Insurance:* Contractor shall purchase and maintain a policy covering third-party injury and property damage, including cleanup costs, as a result of pollution conditions arising from Contractor's operations and completed operations. This insurance must be maintained for no less than three years after final completion.

Contractor's Pollution Liability	Policy limits of not less than:
Each Occurrence/Claim	$1,000,000.00

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Contractor's Pollution Liability	Policy limits of not less than:
General Aggregate	$1,000,000.00

N. *Contractor's Professional Liability Insurance:* If Contractor will provide or furnish professional services under this *Contract*, through a delegation of professional design services or otherwise, then Contractor shall be responsible for purchasing and maintaining applicable professional liability insurance. This insurance must cover negligent acts, errors, or omissions in the performance of professional design or related services by the insured or others for whom the insured is legally liable. The insurance must be maintained throughout the duration of the Contract and for a minimum of two years after Substantial Completion. The retroactive date on the policy must pre-date the commencement of furnishing services on the Project.

Contractor's Professional Liability	Policy limits of not less than:
Each Claim	$
Annual Aggregate	$

O. *Railroad Protective Liability Insurance:* Prior to commencing any Work within 50 feet of railroad-owned and controlled property, Contractor shall (1) endorse its commercial general liability policy with ISO CG 24 17, removing the contractual liability exclusion for work within 50 feet of a railroad, (2) purchase and maintain railroad protective liability insurance meeting the following requirements, (3) furnish a copy of the endorsement to Owner, and (4) submit a copy of the railroad protective policy and other railroad-required documentation to the railroad, and notify Owner of such submittal.

[Insert additional specific requirements, commonly set by the railroad, here.]

Railroad Protective Liability Insurance	Policy limits of not less than:
Each Claim	$N/A
Aggregate	$N/A

P. *Unmanned Aerial Vehicle Liability Insurance:* If Contractor uses unmanned aerial vehicles (UAV—commonly *referred* to as drones) at the Site or in support of any aspect of the Work, Contractor shall obtain UAV liability insurance in the amounts stated; name Owner, Engineer, and all individuals and entities identified in the Supplementary Conditions as additional insureds; and provide a certificate to Owner confirming Contractor's compliance with this requirement. Such insurance will provide coverage for property damage, bodily injury or death, and invasion of privacy.

Unmanned Aerial Vehicle Liability Insurance	Policy limits of not less than:
Each Claim	$N/A
General Aggregate	$N/A

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Q. *Other Required Insurance:* **[Here list additional types and amounts of insurance that Contractor is required to carry.]**

6.04 *Builder's Risk and Other Property Insurance*

SC-6.04 Delete Paragraph 6.04.A and insert the following in its place:

A. Owner shall purchase and maintain builder's risk insurance upon the Work on a completed value basis, in the amount of the Work's full insurable replacement cost (subject to such deductible amounts as may be provided in the Supplementary Conditions or required by Laws and Regulations). The specific requirements applicable to the builder's risk insurance are set forth in the Supplementary Conditions.

SC-6.04 Supplement Paragraph 6.04 of the General Conditions with the following provisions:

F. *Builder's Risk Requirements:* The builder's risk insurance must:

1. be written on a builder's risk "all risk" policy form that at a minimum includes insurance for physical loss or damage to the Work, temporary buildings, falsework, and materials and equipment stored and in transit, and must not exclude the coverage of the following risks: fire; windstorm; hail; flood; earthquake, volcanic activity, and other earth movement; lightning; riot; civil commotion; terrorism; vehicle impact; aircraft; smoke; theft; vandalism and malicious mischief; mechanical breakdown, boiler explosion, and artificially generated electric current; collapse; explosion; debris removal; demolition occasioned by enforcement of Laws and Regulations; and water damage (other than that caused by flood).

    a. Such policy will include an exception that results in coverage for ensuing losses from physical damage or loss with respect to any defective workmanship, methods, design, or materials exclusions.

    b. If insurance against mechanical breakdown, boiler explosion, and artificially generated electric current; earthquake, volcanic activity, and other earth movement; or flood, are not commercially available under builder's risk policies, by endorsement or otherwise, such insurance will be provided through other insurance policies acceptable to Owner and Contractor.

2. cover, as insured property, at least the following: (a) the Work and all materials, supplies, machinery, apparatus, equipment, fixtures, and other property of a similar nature that are to be incorporated into or used in the preparation, fabrication, construction, erection, or completion of the Work, including Owner-furnished or assigned property; (b) spare parts inventory required within the scope of the Contract; and (c) temporary works which are not intended to form part of the permanent constructed Work but which are intended to provide working access to the Site, or to the Work under construction, or which are intended to provide temporary support for the Work under construction, including scaffolding, form work, fences, shoring, falsework, and temporary structures.

3. cover expenses incurred in the repair or replacement of any insured property (including but not limited to fees and charges of contractors, engineers, and architects).

4. extend to cover damage or loss to insured property while in temporary storage at the Site or in a storage location outside the Site (but not including property stored at the

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premises of a manufacturer or Supplier). If this coverage is subject to a sublimit, such sublimit will be a minimum of $**1,000,000.00.**

5. extend to cover damage or loss to insured property while in transit. If this coverage is subject to a sublimit, such sublimit will be a minimum of $**1,000,000.00**.

6. allow for the waiver of the insurer's subrogation rights, as set forth in this Contract.

7. allow for partial occupancy or use by Owner by endorsement, and without cancellation or lapse of coverage.

8. include performance/hot testing and start-up, if applicable.

9. be maintained in effect until the Work is complete, as set forth in Paragraph 15.06.D of the General Conditions, or until written confirmation of Owner's procurement of property insurance following Substantial Completion, whichever occurs first.

10 include as named insureds the Owner, Contractor, Subcontractors (of every tier), and any other individuals or entities required by this Contract to be insured under such builder's risk policy. For purposes of Paragraphs 6.04, 6.05, and 6.06 of the General Conditions, and this and all other corresponding Supplementary Conditions, the parties required to be insured will be referred to collectively as "insureds." In addition to Owner, Contractor, and Subcontractors of every tier, include as insureds the following:

    a. **None**

11. include, in addition to the Contract Price amount, the value of the following equipment and materials to be installed by the Contractor but furnished by the Owner or third parties:

    a. **None**

12. If debris removal in connection with repair or replacement of insured property is subject to a coverage sublimit, such sublimit will be a minimum of $**[amount]**.

13. In addition to the coverage sublimits stated above, the following coverages are also subject to sublimits, as follows:

    a. **[Here list a specific coverage, or cause of loss, that has been determined to be likely to be subject to a sublimit. If not applicable, then delete Paragraph SC-6.04.F.13 in its entirety.]** If this coverage is subject to a sublimit, such sublimit will be a minimum of $**[amount]**.

SC-6.04 Supplement Paragraph 6.04 of the General Conditions with the following provision:

G. *Coverage for Completion Delays:* The builder's risk policy will include, for the benefit of Owner, loss of revenue and soft cost coverage for losses arising from delays in completion that result from covered physical losses or damage. Such coverage will include, without limitation, fixed expenses and debt service for a minimum of 12 months with a maximum deductible of 30 days, compensation for loss of net revenues, rental costs, and attorneys' fees and engineering or other consultants' fees, if not otherwise covered.

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SC-6.04 Supplement Paragraph 6.04 of the General Conditions with the following provisions:

H. *Builder's Risk and Other Property Insurance Deductibles:* The purchaser of any required builder's risk, installation floater, or other property insurance will be responsible for costs not covered because of the application of a policy deductible.

1. The builder's risk policy (or if applicable the installation floater) will be subject to a deductible amount of no more than $**[number]** for direct physical loss in any one occurrence.

SC-6.04 Delete Paragraph 6.04.A of the General Conditions and substitute the following in its place:

A. *Installation Floater*

1. Contractor shall provide and maintain installation floater insurance on a broad form or "all risk" policy providing coverage for materials, supplies, machinery, fixtures, and equipment that will be incorporated into the Work ("Covered Property"). Coverage under the Contractor's installation floater will include loss from covered "all risk" causes (perils) to Covered Property:

a. of the Contractor, and Covered Property of others that is in Contractor's care, custody, and control;

b. while in transit to the Site, including while at temporary storage sites;

c. while at the Site awaiting and during installation, erection, and testing;

d. continuing at least until the installation or erection of the Covered Property is completed, and the Work into which it is incorporated is accepted by Owner.

2. The installation floater coverage cannot be contingent on an external cause or risk, or limited to property for which the Contractor is legally liable.

3. The installation floater coverage will be in an amount sufficient to protect Contractor's interest in the Covered Property. The Contractor will be solely responsible for any deductible carried under this coverage.

4. This policy will include a waiver of subrogation applicable to Owner, Contractor, Engineer, all Subcontractors, and the officers, directors, partners, employees, agents and other consultants and subcontractors of any of them.

ARTICLE 7—CONTRACTOR'S RESPONSIBILITIES

7.03 *Labor; Working Hours*

SC-7.03 Add the following new subparagraphs immediately after Paragraph 7.03.C:

1. Regular working hours will be **7:00 am to 7:00 pm, Monday through Saturday.**

2. Owner's legal holidays are **Memorial Day, Independence Day, Labor Day, and Thanksgiving Day.**

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SC-7.03 Amend the first and second sentences of Paragraph 7.03.C to state "…all Work at the Site must be performed during regular working hours, **Monday** through **Saturday**. Contractor will not perform Work on a **Sunday**, or any legal holiday."

SC-7.03 Delete Paragraph 7.03.C in its entirety, and insert the following:

C. In the absence of any Laws or Regulations to the contrary, Contractor may perform the Work on holidays, during any or all hours of the day, and on any or all days of the week, at Contractor's sole discretion.

SC-7.03 Add the following new paragraph immediately after Paragraph 7.03.C:

D. **Contractor** shall be responsible for the cost of any overtime pay or other expense incurred by the Owner for Engineer's services (including those of the Resident Project Representative, if any), Owner's representative, and construction observation services, occasioned by the performance of Work on Saturday, Sunday, any legal holiday, or as overtime on any regular work day. If Contractor is responsible but does not pay, or if the parties are unable to agree as to the amount owed, then Owner may impose a reasonable set-off against payments due under Article 15.

SC-7.03 Add the following new subparagraph immediately after Paragraph SC-7.03.D:

1. For purposes of administering the foregoing requirement, additional overtime costs are defined as **[Here insert parameters for compensated overtime hours]**.

7.10 *Taxes*

SC-7.10 Add a new paragraph immediately after Paragraph 7.10.A:

A. Owner is exempt from payment of sales and compensating use taxes of the State of **North Dakota** and of cities and counties thereof on all materials to be incorporated into the Work.

1. Owner will furnish the required certificates of tax exemption to Contractor for use in the purchase of supplies and materials to be incorporated into the Work.

2. Owner's exemption does not apply to construction tools, machinery, equipment, or other property purchased by or leased by Contractor, or to supplies or materials not incorporated into the Work.

7.13 *Safety and Protection*

SC-7.13 Insert the following after the second sentence of Paragraph 7.13.G:

The following Owner safety programs are applicable to the Work: **[Here expressly identify by title and/or date, any such Owner safety programs. If Owner's safety programs are included in or addressed in the Specifications, SC-7.13 may be used to provide a cross-reference to the Specification section]**.

ARTICLE 8—OTHER WORK AT THE SITE

8.02 *Coordination*

SC-8.02 Add the following new Paragraph 8.02.C immediately after Paragraph 8.02.B:

C. Owner intends to contract with others for the performance of other work at or adjacent to the Site.

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1. **[Here identify individual or entirety]** shall have authority and responsibility for coordination of the various contractors and work forces at the Site;

2. The following specific matters are to be covered by such authority and responsibility: **[Here itemize such matters]**;

3. The extent of such authority and responsibilities is: **[Here provide the extent]**.

ARTICLE 9—OWNER'S RESPONSIBILITIES

9.13 *Owner's Site Representative*

SC-9.13 Add the following new paragraph immediately after Paragraph 9.12 of the General Conditions:

9.13 *Owner's Site Representative*

A. Owner will furnish an "Owner's Site Representative" to represent Owner at the Site and assist Owner in observing the progress and quality of the Work. The Owner's Site Representative is not Engineer's consultant, agent, or employee. Owner's Site Representative will be [**here identify individual or entity]**. The authority and responsibilities of Owner's Site Representative follow: **[Here describe the duties and activities of the Owner's Site Representative.]**

ARTICLE 10—ENGINEER'S STATUS DURING CONSTRUCTION

10.03 *Resident Project Representative*

SC-10.03 Add the following new subparagraph immediately after Paragraph 10.03.A:

1. On this Project, by agreement with the Owner, the Engineer will not furnish a Resident Project Representative to represent Engineer at the Site or assist Engineer in observing the progress and quality of the Work.

SC-10.03 Add the following new paragraphs immediately after Paragraph 10.03.B:

C. The Resident Project Representative (RPR) will be Engineer's representative at the Site. RPR's dealings in matters pertaining to the Work in general will be with Engineer and Contractor. RPR's dealings with Subcontractors will only be through or with the full knowledge or approval of Contractor. The RPR will:

1. *Conferences and Meetings:* Attend meetings with Contractor, such as preconstruction conferences, progress meetings, job conferences, and other Project-related meetings (but not including Contractor's safety meetings), and as appropriate prepare and circulate copies of minutes thereof.

2. *Safety Compliance:* Comply with Site safety programs, as they apply to RPR, and if required to do so by such safety programs, receive safety training specifically related to RPR's own personal safety while at the Site.

3. *Liaison*

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a. Serve as Engineer's liaison with Contractor. Working principally through Contractor's authorized representative or designee, assist in providing information regarding the provisions and intent of the Contract Documents.

b. Assist Engineer in serving as Owner's liaison with Contractor when Contractor's operations affect Owner's on-Site operations.

c. Assist in obtaining from Owner additional details or information, when required for Contractor's proper execution of the Work.

4. *Review of Work; Defective Work*

a. Conduct on-Site observations of the Work to assist Engineer in determining, to the extent set forth in Paragraph 10.02, if the Work is in general proceeding in accordance with the Contract Documents.

b. Observe whether any Work in place appears to be defective.

c. Observe whether any Work in place should be uncovered for observation, or requires special testing, inspection or approval.

5. *Inspections and Tests*

a. Observe Contractor-arranged inspections required by Laws and Regulations, including but not limited to those performed by public or other agencies having jurisdiction over the Work.

b. Accompany visiting inspectors representing public or other agencies having jurisdiction over the Work.

6. *Payment Requests:* Review Applications for Payment with Contractor.

7. *Completion*

a. Participate in Engineer's visits regarding Substantial Completion.

b. Assist in the preparation of a punch list of items to be completed or corrected.

c. Participate in Engineer's visit to the Site in the company of Owner and Contractor regarding completion of the Work, and prepare a final punch list of items to be completed or corrected by Contractor.

d. Observe whether items on the final punch list have been completed or corrected.

D. The RPR will not:

1. Authorize any deviation from the Contract Documents or substitution of materials or equipment (including "or-equal" items).

2. Exceed limitations of Engineer's authority as set forth in the Contract Documents.

3. Undertake any of the responsibilities of Contractor, Subcontractors, or Suppliers.

4. Advise on, issue directions relative to, or assume control over any aspect of the means, methods, techniques, sequences or procedures of construction.

5 Advise on, issue directions regarding, or assume control over security or safety practices, precautions, and programs in connection with the activities or operations of Owner or Contractor.

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6. Participate in specialized field or laboratory tests or inspections conducted off-site by others except as specifically authorized by Engineer.

7. Authorize Owner to occupy the Project in whole or in part.

ARTICLE 11—CHANGES TO THE CONTRACT

No suggested Supplementary Conditions in this Article.

ARTICLE 12—CLAIMS

No suggested Supplementary Conditions in this Article.

ARTICLE 13—COST OF WORK; ALLOWANCES, UNIT PRICE WORK

13.01 *Cost of the Work*

SC-13.01 Supplement Paragraph 13.01.B.5.c.(2) by adding the following sentence:

The equipment rental rate book that governs the included costs for the rental of machinery and equipment owned by Contractor (or a related entity) under the Cost of the Work provisions of this Contract is the most current edition of **[name of equipment rental rate book]**.

SC-13.01 Supplement Paragraph 13.01.C.2 by adding the following definition of small tools and hand tools:

a. For purposes of this paragraph, "small tools and hand tools" means any tool or equipment whose current price if it were purchased new at retail would be less than $500. **[or insert other threshold price.]**

13.03 *Unit Price Work*

SC-13.03 Delete Paragraph 13.03.E in its entirety and insert the following in its place:

E. *Adjustments in Unit Price*

1. Contractor or Owner shall be entitled to an adjustment in the unit price with respect to an item of Unit Price Work if:

a. the extended price of a particular item of Unit Price Work amounts to **[number]** percent or more of the Contract Price (based on estimated quantities at the time of Contract formation) and the variation in the quantity of that particular item of Unit Price Work actually furnished or performed by Contractor differs by more than **[number]** percent from the estimated quantity of such item indicated in the Agreement; and

b. Contractor's unit costs to perform the item of Unit Price Work have changed materially and significantly as a result of the quantity change.

2. The adjustment in unit price will account for and be coordinated with any related changes in quantities of other items of Work, and in Contractor's costs to perform such other Work, such that the resulting overall change in Contract Price is equitable to Owner and Contractor.

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3. Adjusted unit prices will apply to all units of that item.

ARTICLE 14—TESTS AND INSPECTIONS; CORRECTION, REMOVAL, OR ACCCEPTANCE OF DEFECTIVE WORK

No suggested Supplementary Conditions in this Article.

ARTICLE 15—PAYMENTS TO CONTRACTOR, SET OFFS; COMPLETIONS; CORRECTION PERIOD

15.01 *Progress Payments*

SC-15.01 Add the following new Paragraph 15.01.F:

F. For contracts in which the Contract Price is based on the Cost of Work, if Owner determines that progress payments made to date substantially exceed the actual progress of the Work (as measured by reference to the Schedule of Values), or present a potential conflict with the Guaranteed Maximum Price, then Owner may require that Contractor prepare and submit a plan for the remaining anticipated Applications for Payment that will bring payments and progress into closer alignment and take into account the Guaranteed Maximum Price (if any), through reductions in billings, increases in retainage, or other equitable measures. Owner will review the plan, discuss any necessary modifications, and implement the plan as modified for all remaining Applications for Payment.

15.03 *Substantial Completion*

SC-15.03 Add the following new subparagraph to Paragraph 15.03.B:

1. If some or all of the Work has been determined not to be at a point of Substantial Completion and will require re-inspection or re-testing by Engineer, the cost of such re-inspection or re-testing, including the cost of time, travel and living expenses, will be paid by Contractor to Owner. If Contractor does not pay, or the parties are unable to agree as to the amount owed, then Owner may impose a reasonable set-off against payments due under this Article 15.

15.08 *Correction Period*

SC-15.08 Add the following new Paragraph 15.08.G:

G. The correction period specified as one year after the date of Substantial Completion in Paragraph 15.08.A of the General Conditions is hereby revised to be the number of years set forth in SC-6.01.B.1; or if no such revision has been made in SC-6.01.B, then the correction period is hereby specified to be **[number]** years after Substantial Completion.

ARTICLE 16—SUSPENSION OF WORK AND TERMINATION

No suggested Supplementary Conditions in this Article.

ARTICLE 17—FINAL RESOLUTIONS OF DISPUTES

17.02 *Arbitration*

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SC-17.02 Add the following new paragraph immediately after Paragraph 17.01.

17.02 *Arbitration*

A. All matters subject to final resolution under this Article will be settled by arbitration administered by the American Arbitration Association in accordance with its Construction Industry Arbitration Rules (subject to the conditions and limitations of this Paragraph SC-17.02). Any controversy or claim in the amount of $100,000 or less will be settled in accordance with the American Arbitration Association's supplemental rules for Fixed Time and Cost Construction Arbitration. This agreement to arbitrate will be specifically enforceable under the prevailing law of any court having jurisdiction.

B. The demand for arbitration will be filed in writing with the other party to the Contract and with the selected arbitration administrator, and a copy will be sent to Engineer for information. The demand for arbitration will be made within the specific time required in Article 17, or if no specified time is applicable within a reasonable time after the matter in question has arisen, and in no event will any such demand be made after the date when institution of legal or equitable proceedings based on such matter in question would be barred by the applicable statute of limitations.

C. The arbitrator(s) must be licensed engineers, contractors, attorneys, or construction managers. Hearings will take place pursuant to the standard procedures of the Construction Arbitration Rules that contemplate in-person hearings. The arbitrators will have no authority to award punitive or other damages not measured by the prevailing party's actual damages, except as may be required by statute or the Contract. Any award in an arbitration initiated under this clause will be limited to monetary damages and include no injunction or direction to any party other than the direction to pay a monetary amount.

D. The Arbitrators will have the authority to allocate the costs of the arbitration process among the parties, but will only have the authority to allocate attorneys' fees if a specific Law or Regulation or this Contract permits them to do so.

E. The award of the arbitrators must be accompanied by a reasoned written opinion and a concise breakdown of the award. The written opinion will cite the Contract provisions deemed applicable and relied on in making the award.

F. The parties agree that failure or refusal of a party to pay its required share of the deposits for arbitrator compensation or administrative charges will constitute a waiver by that party to present evidence or cross-examine witness. In such event, the other party shall be required to present evidence and legal argument as the arbitrator(s) may require for the making of an award. Such waiver will not allow for a default judgment against the non-paying party in the absence of evidence presented as provided for above.

G. No arbitration arising out of or relating to the Contract will include by consolidation, joinder, or in any other manner any other individual or entity (including Engineer, and Engineer's consultants and the officers, directors, partners, agents, employees or consultants of any of them) who is not a party to this Contract unless:

1. the inclusion of such other individual or entity will allow complete relief to be afforded among those who are already parties to the arbitration;

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2. such other individual or entity is substantially involved in a question of law or fact which is common to those who are already parties to the arbitration, and which will arise in such proceedings;

3. such other individual or entity is subject to arbitration under a contract with either Owner or Contractor, or consents to being joined in the arbitration; and

4. the consolidation or joinder is in compliance with the arbitration administrator's procedural rules.

H. The award will be final. Judgment may be entered upon it in any court having jurisdiction thereof, and it will not be subject to modification or appeal, subject to provisions of the Laws and Regulations relating to vacating or modifying an arbitral award.

I. Except as may be required by Laws or Regulations, neither party nor an arbitrator may disclose the existence, content, or results of any arbitration hereunder without the prior written consent of both parties, with the exception of any disclosure required by Laws and Regulations or the Contract. To the extent any disclosure is allowed pursuant to the exception, the disclosure must be strictly and narrowly limited to maintain confidentiality to the extent possible.

17.03 *Attorneys' Fees*

SC-17.03 Add the following new paragraph immediately after Paragraph 17.02. [Note: If there is no Paragraph 17.02, because neither arbitration nor any other dispute resolution process has been specified here in the Supplementary Conditions, then revise this to state "Add the following new Paragraph immediately after Paragraph 17.01" and revise the numbering accordingly].

17.03 *Attorneys' Fees*

A. For any matter subject to final resolution under this Article, the prevailing party shall be entitled to an award of its attorneys' fees incurred in the final resolution proceedings, in an equitable amount to be determined in the discretion of the court, arbitrator, arbitration panel, or other arbiter of the matter subject to final resolution, taking into account the parties' initial demand or defense positions in comparison with the final result.

ARTICLE 18—MISCELLANEOUS

18.08 *Assignment of Contract*

SC-18.08 Add the following new paragraph immediately after Paragraph 18.08.A:

B. The contract dated **[date]** between Owner as "buyer" and **[identify seller]** as "seller" for procurement of goods and special services ("procurement contract") **[is hereby] [will be]** assigned to Contractor by Owner, and Contractor **[accepts] [will accept]** such assignment. A form documenting the assignment is attached as an exhibit to this Contract.

1. This assignment will occur on the **[Effective Date of the Contract]**, and will relieve the Owner as "buyer" from all further obligations and liabilities under the procurement contract.

2. Upon assignment, the "seller" will be a Subcontractor or Supplier of the Contractor, and Contractor will be responsible for seller's performance, acts, and omissions, as set forth

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in Paragraph 7.07 of the General Conditions just as Contractor is responsible for all other Subcontractors and Suppliers.

3. Notwithstanding this assignment, all performance guarantees and warranties required by the procurement contract will continue to run for the benefit of the Owner and, in addition, for the benefit of the Contractor.

4. Except as noted in the procurement contract, all rights, duties and obligations of Engineer to "buyer" and "seller" under the procurement contract will cease **[upon the assignment to Contractor]**.

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EXHIBIT A—SOFTWARE REQUIREMENTS FOR ELECTRONIC DOCUMENT EXCHANGE

Item	Electronic Documents	Transmittal Means	Data Format	Note (1)
a.1	General communications, transmittal covers, meeting notices and responses to general information requests for which there is no specific prescribed form.	Email	Email	
a.2	Meeting agendas, meeting minutes, RFI's and responses to RFI's, and Contract forms.	Email w/ Attachment	PDF	(2)
a.3	Contactors Submittals (Shop Drawings, "or equal" requests, substitution requests, documentation accompanying Sample submittals and other submittals) to Owner and Engineer, and Owner's and Engineer's responses to Contractor's Submittals, Shop Drawings, correspondence, and Applications for Payment.	Email w/ Attachment	PDF	
a.4	Correspondence; milestone and final version Submittals of reports, layouts, Drawings, maps, calculations and spreadsheets, Specifications, Drawings and other Submittals from Contractor to Owner or Engineer and for responses from Engineer and Owner to Contractor regarding Submittals.	Email w/ Attachment or LFE	PDF	
a.5	Layouts and drawings to be submitted to Owner for future use and modification.	Email w/ Attachment or LFE	DWG	
a.6	Correspondence, reports and Specifications to be submitted to Owner for future word processing use and modification.	Email w/ Attachment or LFE	DOC	
a.7	Spreadsheets and data to be submitted to Owner for future data processing use and modification.	Email w/ Attachment or LFE	EXC	
a.8	Database files and data to be submitted to Owner for future data processing use and modification.	Email w/ Attachment or LFE	DB	

Notes	
(1)	All exchanges and uses of transmitted data are subject to the appropriate provisions of Contract Documents.
(2)	Transmittal of written notices is governed by Paragraph 18.01 of the General Conditions.

Key	
Email	Standard Email formats (.htm, .rtf, or .txt). Do not use stationery formatting or other features that impair legibility of content on screen or in printed copies
LFE	Agreed upon Large File Exchange method (FTP, CD, DVD, hard drive)
PDF	Portable Document Format readable by Adobe® Acrobat Reader Version **[number]** or later
DWG	Autodesk® AutoCAD .dwg format Version **[number]**
DOC	Microsoft® Word .docx format Version **[number]**
EXC	Microsoft® Excel .xls or .xml format Version **[number]**
DB	Microsoft® Access .mdb format Version **[number]**

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EXHIBIT B—FORESEEABLE BAD WEATHER DAYS

Month	Number of Foreseeable Bad Weather Days in Month Based on Precipitation as Rain Equivalent (inches) (1)	Ambient Outdoor Air Temperature (degrees F)	
		Number of Foreseeable Bad Weather Days in Month Based on Low Temperature (at 11:00 a.m.)	Number of Foreseeable Bad Weather Days in Month Based on High Temperature (at 3:00 p.m.)
January			
February			
March			
April			
May			
June			
July			
August			
September			
October			
November			
December			

Notes:

1. Two inches of sleet equal one inch of rain. Five inches of wet, heavy snow equal one inch of rain. Fifteen inches of "dry" powder snow equals one inch of rain.

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EXHIBIT C—GEOTECHNICAL BASELINE REPORT SUPPLEMENT TO THE SUPPLEMENTARY CONDITIONS

1.01 *Definitions*

SC-1.01 Add to the list of definitions in Paragraph 1.01.A by inserting the following as numbered items in their proper alphabetical positions:

1. *Geotechnical Baseline Report (GBR)*—The interpretive report prepared by or for Owner regarding subsurface conditions at the Site, and containing specific baseline geotechnical conditions that may be anticipated or relied upon for bidding and contract administration purposes, subject to the controlling provisions of the Contract, including the GBR's own terms. The GBR is a Contract Document.

2. *Geotechnical Data Report (GDR)*—The factual report that collects and presents data regarding actual subsurface conditions at or adjacent to the Site, including Technical Data and other geotechnical data, prepared by or for Owner in support of the Geotechnical Baseline Report. The GDR's content may include logs of borings, trenches, and other site investigations, recorded measurements of subsurface water levels, the results of field and laboratory testing, and descriptions of the investigative and testing programs. The GDR does not include an interpretation of the data. If opinions, or interpretive or speculative non-factual comments or statements appear in a document that is labeled a GDR, such opinions, comments, or statements are not operative parts of the GDR and do not have contractual standing. Subject to that exception, the GDR is a Contract Document.

5.03 *Subsurface and Physical Conditions*

SC-5.03 Delete Paragraph 5.03 in its entirety and replace with the following:

5.03 *Subsurface and Physical Conditions*

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

1. those reports of explorations and tests of subsurface conditions at or adjacent to the Site (other than any Geotechnical Data Report or Geotechnical Baseline Report) that contain Technical Data. Such reports are as follows:

   a. *Report Title:* **[Exact title of the document]**

   b. *Date of Report:* **[Date report was issued]**

   c. *Technical Data in report upon which Contractor may rely*: **[Identify Technical Data (for example, "Boring Log, Test Site 3") and specify page number or other reference where Technical Data is located within the report. List multiple Technical Data line items per entry when appropriate.]**

2. those drawings of existing physical conditions at or adjacent to the Site, including those drawings depicting existing surface or subsurface structures at or adjacent to the Site (except Underground Facilities), that contain Technical Data. Such drawings are as follows:

   a. *Drawings Title:* **[Exact title of the drawings]**

   b. *Date of Drawings:* **[Date drawings were issued]**

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c. *Technical Data in drawings upon which Contractor may rely:* **[Identify Technical Data (for example, "Plan View of Rock Outcroppings") in drawings, or state "All information in drawing" if entire content is Technical Data entitled to reliance; and specify drawing number, page number, or other reference where the Technical Data is located. List multiple Technical Data line items per entry when appropriate.]**

3. Contractor may examine copies of reports and drawings identified immediately above that were not included with the Bidding Documents at **[location]** during regular business hours, or may request copies from Engineer, at the cost of reproduction.

B. *Underground Facilities:* Underground Facilities are shown or indicated on the Drawings, pursuant to Paragraph 5.05, and not in the drawings referred to in Paragraph SC-5.03.A. Information and data regarding the presence or location of Underground Facilities are not intended to be categorized, identified, or defined as Technical Data.

C. *Reliance by Contractor on Technical Data Authorized:* Contractor may rely upon the accuracy of the Technical Data expressly identified in the Supplementary Conditions with respect to such reports and drawings, but such reports and drawings are not Contract Documents. If no such express identification has been made, then Contractor may rely upon the accuracy of the Technical Data as defined in Paragraph 1.01.A.46.b.

D. *Limitations of Other Data and Documents:* Except for such reliance on 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. the contents of other Site-related documents made available to Contractor, such as record drawings from other projects at or adjacent to the Site, or Owner's archival documents concerning the Site; or

4. any Contractor interpretation of or conclusion drawn from any Technical Data or any such other data, interpretations, opinions, or information.

E. *Geotechnical Baseline Report*

1. This Contract contains a Geotechnical Baseline Report ("GBR"), identified as follows: **[Example: Geotechnical Baseline Report for Northwest Interceptor, dated February 12, 2013, prepared by ABC Geotechnical Engineers, Inc., Sacramento, California]**. This Contract also contains a Geotechnical Data Report (GDR), identified as follows: **[Example: Geotechnical Data Report for Northwest Interceptor, dated June 15, 2012, prepared by ABC Geotechnical Engineers, Inc., Sacramento, California]**.

2. The GBR and GDR are incorporated as Contract Documents. The GBR and GDR are to be used in conjunction with other Contract Documents, including the Drawings and

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Specifications. If there is a conflict between the terms of the GBR and the GDR, the GBR's terms prevail.

3. The GBR describes certain select subsurface conditions that are anticipated to be encountered by Contractor during construction in specified locations (referred to here in the Supplementary Conditions as "Baseline Conditions"). These may include ground, geological, groundwater, and other subsurface geotechnical conditions, and baselines of anticipated Underground Facilities or subsurface structures.

4. The Baseline Conditions will be used to assist in the administration of the Contract's differing site conditions clause at locations where subsurface conditions have been baselined. If a condition is baselined in the GBR, then only the pertinent Baseline Conditions will be used to determine whether there is a differing site condition; and no other indication of that condition in the Contract Documents or Technical Data, or of a condition that describes, quantifies, or measures a similar characteristic of the subsurface, will be used for the differing site condition determination.

5. The Baseline Conditions will not be used to make differing site conditions determinations at locations that have not been baselined in the GBR, or at any location with respect to subsurface conditions that the Baseline Conditions do not address. If Underground Facilities or Hazardous Environmental Conditions are expressly addressed in the Baseline Conditions, then comparison to such Baseline Conditions will be the primary means of determining (a) whether an Underground Facility was shown or indicated with reasonable accuracy, as provided in Paragraph 5.05 of the General Conditions, or (b) whether a Hazardous Environmental Condition was shown or indicated in the Contract Documents as indicated in Paragraph 5.06.H of the General Conditions. As indicated in Paragraph SC-5.04 below, the GDR will be the primary resource for differing site conditions determinations in cases in which the GBR is inapplicable.

6. The descriptions of subsurface conditions provided in the GBR are based on geotechnical investigations, laboratory tests, interpretation, interpolation, extrapolation, and analyses. Neither Owner, Engineer, nor any geotechnical or other consultant warrants or guarantees that actual subsurface conditions will be as described in the GBR, nor is the GBR intended to warrant or guarantee the use of specific means or methods of construction.

7. The behavior of the ground during construction depends substantially upon the Contractor's selected means, methods, techniques, sequences, and procedures of construction. If ground behavior conditions are baselined in the GBR, they are based on stated assumptions regarding construction means and methods.

8. The GBR will not reduce or relieve Contractor of its responsibility for the planning, selection, and implementation of safety precautions and programs incident to Contractor's means, methods, techniques, sequences, and procedures of construction, or to the Work.

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5.04 *Differing Subsurface or Physical Conditions*

SC-5.04 Delete Paragraph 5.04 in its entirety and replace with the following:

5.04 *Differing Subsurface or Physical Conditions*

A. *Notice:* If Contractor believes that any subsurface condition that is uncovered or revealed at the Site:

1. differs materially from conditions shown or indicated in the GBR; or

2. differs materially from conditions shown or indicated in the GDR, to the extent the GBR is inapplicable; or

3. differs materially from conditions shown or indicated in Contract Documents other than the GBR or GDR, to the extent the GBR and GDR are inapplicable; or

4. to the extent the GBR and GDR are inapplicable, is of such a nature as to establish that any Technical Data on which Contractor is entitled to rely as provided in Paragraph 5.03 is materially inaccurate; or

5. to the extent the GBR and GDR are inapplicable, is of such a nature as to require a change in the Drawings or Specifications; or

6. to the extent the GBR and GDR are inapplicable, 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 conditions or performing any Work in connection therewith (except in an emergency as required by Paragraph 7.15), notify Owner and Engineer in writing about such condition. Contractor shall not further disturb such condition or perform any Work in connection therewith (except with respect to an emergency) until receipt of a written statement permitting Contractor to do so.

B. *Engineer's Review:* After receipt of written notice as required by the preceding paragraph, Engineer will promptly review the subsurface or physical condition in question; determine the necessity of Owner's obtaining additional exploration or tests with respect to the condition; conclude whether the condition falls within any one or more of the differing site condition categories in Paragraph SC-5.04.A above; obtain any pertinent cost or schedule information from Contractor; prepare recommendations to Owner regarding the Contractor's resumption or continuation of Work in connection with the subsurface or physical condition in question and the need for any change in the Drawings or Specifications; and advise Owner in writing of Engineer's findings, conclusions, and recommendations.

C. *Owner's Statement to Contractor Regarding Site Condition:* After receipt of Engineer's written findings, conclusions, and recommendations, Owner shall issue a written statement to Contractor (with a copy to Engineer) regarding the subsurface or physical condition in question, addressing the resumption or continuation of Work in connection with such condition, indicating whether any change in the Drawings or Specifications will be made, and adopting or rejecting Engineer's written findings, conclusions, and recommendations, in whole or in part.

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D. *Early Resumption of Work:* If at any time Engineer determines that Work in connection with the subsurface or physical condition in question may resume prior to completion of Engineer's review or Owner's issuance of its statement to Contractor, because the condition in question has been adequately documented, and analyzed on a preliminary basis, then the Engineer may at its discretion instruct Contractor to resume such Work.

E. *Possible Price and Times Adjustments*

1. Contractor shall be entitled to an equitable adjustment in Contract Price or Contract Times, to the extent that the existence of a differing subsurface or physical condition, or any related delay, disruption, or interference, 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 fall within any one or more of the categories described in Paragraph SC-5.04.A;

    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 Paragraph 13.03 of the General Conditions; and

    c. Contractor's entitlement to an adjustment of the Contract Times is subject to the provisions of Paragraphs 4.05.D and 4.05.E.

2. Contractor shall not be entitled to any adjustment in the Contract Price or Contract Times with respect to a subsurface or physical condition if:

    a. Contractor knew of the existence of such condition at the time Contractor made a 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 otherwise; or

    b. the existence of such condition reasonably could have been discovered or revealed as a result of any examination, investigation, exploration, test, or study of the Site and contiguous areas expressly required by the Bidding Requirements or Contract Documents to be conducted by or for Contractor prior to Contractor's making such commitment; or

    c. Contractor failed to give the written notice as required by Paragraph SC-5.04.A.

3. If Owner and Contractor agree regarding Contractor's entitlement to and the amount or extent of any adjustment in the Contract Price or Contract Times, then any such adjustment must be set forth in a Change Order.

4. Contractor may submit a Change Proposal regarding its entitlement to or the amount or extent of any adjustment in the Contract Price or Contract Times, no later than 30 days after Owner's issuance of the Owner's written statement to Contractor regarding the subsurface or physical condition in question.

F. *Underground Facilities; Hazardous Environmental Conditions:* Paragraph 5.05 of the General Conditions governs rights and responsibilities regarding the presence or location of Underground Facilities. Paragraph 5.06 of the General Conditions governs rights and responsibilities regarding Hazardous Environmental Conditions. The provisions of

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Paragraphs SC-5.03 and SC-5.04 are not applicable to the presence or location of Underground Facilities, or to Hazardous Environmental Conditions.

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ATTACHMENT B.6 – ENGINEER'S DEVELOPMENT OF SUPPLEMENTARY CONDITIONS

Notes to User:

1. This attachment contains a list of changes to be made by Engineer to the Supplementary Conditions (SC) of the Construction Contract (EJCDC C-800, 2018). The Engineer may also add other project-specific supplementary conditions as required for the Project.

2. The SC document that is developed for a Project is the contractual means by which the Standard General Conditions of the Construction Contract (EJCDC C-700, 2018) are modified and supplemented for the Project. The references in the SC items below (and in EJCDC C-800 as published) to adding, deleting, amending, or supplementing are referring to the paragraphs of C-700. Thus, the first item below, SC-1.01.A.8, is a contractual provision that adds the stated language ("The Change Order form to be used etc.") to Article 1.01.A.8 of C-700.

3. The SC items that follow are mandatory for each specific Project, unless noted otherwise. In most cases they are new (supplemental) SC items; in a few cases, they replace or expand on a SC item that is in EJCDC C-800, as published. Guidance notes should not be included in the Bidding Documents.

4. The Engineer (in cooperation with the Owner) should follow the guidance of EJCDC C-800, as published, to develop Project-specific SC; as the published guidance indicates, some of the published SC items are mandatory or require additional Project-specific input, such as insurance coverage limits. Other SC items in C-800 as published are optional but, in many cases, will be useful for the specific Project.

5. If the project requires compliance with American Iron and Steel (AIS) instead of Build America Buy America Act (BABAA), then SC-1.01.A.52 should remove the BABAA reference and define Domestic Preference as "The American Iron and Steel (AIS) requirements mandated by Section 746 of Title VII of the Consolidated Appropriations Act of 2017 of 2017 and subsequent annual appropriations for WWD programs.". Also, in such cases the BABAA specific waivers listed in SC 19.14 should be removed and replaced with applicable AIS waivers (De Minimis and Small Components).

6. Contract the Rural Development State Office for guidance as needed.

- ARTICLE 1 – Delete the sentence "No suggested Supplementary Conditions in this Article."

- SC-1.01.A.8 – Add the following at the end of the Paragraph:

  The Change Order form to be used on this Project is EJCDC C-941 (2018). Agency approval is required before Change Orders are effective.

- SC-1.01.A.30 – Add the following at the end of the Paragraph:

  For the purposes of Rural Development, this term is synonymous with the term

"applicant" as defined in 7 CFR 1780.7 (a) (1), (2) and (3) and is an entity receiving financial assistance from the federal programs.

- SC-1.01.A.50 – Add the following at the end of the Paragraph:

  The Work Change Directive form to be used on this Project is EJCDC C-940 (2018). Agency approval is required before a Work Change Directive is issued.

- SC-1.01.A.51 – Add the following new paragraph immediately after Paragraph 1.01.A.50:

  51. Agency – The Project is financed in whole or in part by USDA Rural Utilities Service pursuant to the Consolidated Farm and Rural Development Act (7 U.S.C. Section 1921 et seq.). The Rural Utilities Service programs are administered through the USDA Rural Development offices; therefore, the Agency for these documents is USDA Rural Development.

- SC-1.01.A.52 – Add the following new paragraph with the title "Domestic Preference Definitions" immediately after Paragraph 1.01.A.51:

  52.a *Build America, Buy America Act (BABAA)* – Requirements mandated by Title IX of the Infrastructure Investment and Jobs Act (IIJA), Pub. L. 117-58, §§ 70901-70953-58 mandating domestic preference that all iron and steel, manufactured products, and construction materials are produced in the United States, in accordance with 2 CFR part 184.

  52.b *Construction Materials* – Those articles, materials, or supplies — other than an item of primarily iron or steel; a manufactured product; cement and cementitious materials; aggregates such as stone, sand, or gravel; or aggregate binding agents or additives— that are or consist primarily of: non-ferrous metals, plastic and polymer-based products, glass, lumber or drywall.

  52.c *Contractor's Certification* – A certification submitted by Contractor that, to the best of the Contractor's knowledge and belief, all Work complies with Domestic Preference requirements.

  52.d *De Minimis* – Materials and products that represent a small portion of an infrastructure project, specifically no more than 5% of the project costs up to a maximum of $1,000,000,

  52.e *Domestic Preference* – The Build America, Buy America Act (BABAA) requirements under Title IX of the Infrastructure Investment and Jobs Act (IIJA), Pub. L. 117-58, §§ 70901-70953.

52.f *Engineer's Certification* – Documentation submitted by the Engineer that Drawings, Specifications, and Bidding Documents comply with Domestic Preference requirements.

52.g *Manufactured Product* – Items assembled out of components, or otherwise made or processed from raw materials into finished products. Manufactured products must be manufactured (assembled) in the United States, and the cost of components that were mined, produced, or manufactured in the United States must be greater than 55 percent of the total cost of all components of the product.

52.h *Manufacturer's Certification* – Documentation provided by the Manufacturer stating that Domestic Preference requirements have been satisfied for all provided items. Manufacturers' Certifications must include (at a minimum): specific list of products (using common names) associated with the certificate, location of the final manufacturing, signature of the manufacturer's representative, and a reference to the Domestic Preference statute. If items are purchased via a Supplier, distributor, vendor, etc. from the Manufacturer directly, then the Supplier, distributor, vendor, etc. will be responsible for obtaining and providing these certifications to the parties purchasing the products.

52.i *Minor Components* - Components *within* an iron and/or steel product otherwise compliant with the Domestic Preference requirements. This waiver, typically used by Manufacturers, allows use of non-domestically produced miscellaneous Minor Components comprising up to five percent of the total material cost of an otherwise domestically produced iron and steel product. However, unless a separate waiver for a product has been approved, all other iron and steel components in said product must still meet the Domestic Preference requirements. This waiver does not exempt the whole product from the Domestic Preference requirements only Minor Components within said product and the iron or steel components of the product must be produced domestically.

52.j *Primarily Iron or Steel* - A product is made of greater than 50 percent iron or Steel on a materials cost basis.

- SC-2.02.A – Delete **[number]** and insert in its place "five."

- SC-4.01.A – Delete the paragraph, and replace with:

A. The Contract Times will commence on the day indicated in the Notice to Proceed. The Notice to Proceed date must be no later than 30 days after the Effective Date of the Contract. The Owner must issue a Notice to Proceed".

- SC-4.05.C.5 – Paragraph is mandatory for WWD projects.

- SC-4.05.C.5.a – Add the following at the end of this paragraph:

Extreme or unusual weather that is typical for a given region, elevation, or season should not be considered abnormal weather conditions. Requests for time extensions due to abnormal weather conditions will be submitted to the Engineer within five days of the end of the abnormal weather condition event. It is the responsibility of the Contractor to provide the information listed in SC 4.05.C.5.b.

- SC-6.01 – Disregard EJCDC Guidance Notes – Performance and Payment Bonds, Note 1. Performance and Payment Bonds are required for WWD projects.

- SC-6.01 – EJCDC Guidance Notes – "Other Bonds," Warranty Bond, Note 1. RD does not require a Warranty Bond, and RD will not accept a Warranty Bond in place of a Performance and Payment Bond. The decision to include a Warranty Bond is made by the Owner and their counsel. Please refer to EJCDC for guidance.

- SC-7.04.D – Add the following new paragraph immediately after Paragraph 7.04.C:

  D. All products must meet Domestic Preference requirements.

- SC-7.04.E – Add the following new paragraph immediately after Paragraph 7.04.D:

  E. For projects utilizing a *De Minimis* waiver, Contractor shall maintain an itemized list of non-domestically produced components and ensure that the cost is less than 5% of total project cost for project up to a maximum of $1,000,000.

- SC-7.05.A – Amend the third sentence of paragraph by striking out the following words:

  Unless the specification or description contains or is followed by words reading that no like, equivalent, or "or-equal" item is permitted,

- SC-7.05.A.1.a.3 – Amend the last sentence of Paragraph a.3 by striking out "and;" and adding a period at the end of Paragraph a.3.

- SC-7.05.A.1.a.4 – Delete paragraph in its entirety and insert "Deleted."

- SC-7.05.B – Add the following at the end of paragraph:

  Contractor shall include a Manufacturer's Certification or waiver for compliance with Domestic Preference requirements and supporting data, as applicable. Refer to Sample Language for Manufacturer's Certification provided in these Contract Documents.

- SC-7.06.A.3.a.2 – Remove "and" from the end of paragraph.

- SC-7.06.A.3.a.3 – Add "; and" to the end of paragraph.

- SC-7.06.A.3.a.4 – Add the following new paragraph immediately after Paragraph 7.06.A.3.a.3:

  4. Comply with Domestic Preference requirements by providing Manufacturer's Certification or waiver , as applicable. Refer to Sample Language for Manufacturers' Certification provided in these Contract Documents.

- SC-7.07.B – Delete paragraph in its entirety and insert "Deleted".

- SC-7.07.E – Delete the second sentence of paragraph and insert the following in its place:

  Owner may not require that Contractor use a specific replacement.

- SC-7.12.A Amend paragraph by adding the following after "written interpretations and clarifications,":

  Manufacturers' Certifications,

- SC-7.16.A.1.c – Amend paragraph by deleting the last period and adding:

  , including Manufacturer's Certification, or waiver for any item in the submittal subject to Domestic Preference requirements. Refer to the Sample Language for Manufacturers' Certification provided in these Contract Documents.

- SC-7.16.C.9 – Add new paragraph immediately after Paragraph 7.16.C.8:

  9. Engineer's review and approval of a Shop Drawing or Sample shall include review of Manufacturers' Certifications and any waivers in order to document compliance with Domestic Preference requirements, as applicable.

- SC-7.17.F – Add new paragraph immediately after Paragraph 7.17.E:

  F. Contractor shall certify prior to final payment that all Work and Materials have complied with Domestic Preference requirements. Contractor shall provide Certification to Owner and Engineer. Refer to the Sample Language for Contractor's Certification provided in these Contract Documents.

- ARTICLE 11 – Delete the sentence "No suggested Supplementary Conditions in this Article."

- SC-11.02.C – Add new paragraph immediately after Paragraph 11.02.B:

C. The Engineer or Owner shall contact the Agency for concurrence on each Change Order prior to issuance. All Contract Change Orders must be concurred on (signed) by Agency before they are effective.

- SC-11.03.A.2 - Add new Paragraph 11.03.A.2 immediately after Paragraph 11.03.A, which shall be renamed Paragraph 11.03.A.1:

  2. The Engineer or Owner shall contact the Agency for concurrence on each Work Change Directive prior to issuance. Once authorized by Owner, a copy of each Work Change Directive shall be provided by Engineer to the Agency.

- SC-11.05.B – Add the following at the end of this paragraph:

  For Owner-authorized changes in the Work, the Contractor will provide the Manufacturer's Certification, or waiver, for materials subject to Domestic Preference requirements except when sole-source is specified, in which case the Engineer will provide the Manufacturer's Certification, or waiver.

- SC-11.09.B.2.c – Add new paragraph immediately after Paragraph 11.09.B.2.b:

  c. For change orders involving materials subject to Domestic Preference requirements, Contractor shall include a Manufacturer's Certification or waiver , as applicable. Refer to the Sample Language for Manufacturer's Certification provided in these Contract Documents.

- SC-13.02.C – Delete paragraph in its entirety and insert "Deleted".

- SC 13.03.E – Delete paragraph in its entirety and replace with SC 13.03.E as shown in the EJCDC C-800 Supplementary Conditions.

- ARTICLE 14 – Delete the sentence "No suggested Supplementary Conditions in this Article."

- SC-14.03.G – Add new paragraph immediately after Paragraph 14.03.F:

  G. Installation of materials that are non-compliant with Domestic Preference requirements shall be considered defective work. Contractor should ensure that Engineer has an approved Manufacturer's Certification, or waiver, prior to any domestic preference compliant item being delivered to the project site.

- SC-15.01.B.4 – Add the following language at the end of paragraph:

  No payments will be made that would deplete the retainage, place in escrow any funds that are required for retainage or invest the retainage for the benefit of the

Contractor.

- SC-15.01.B.5 – Add new paragraph immediately after Paragraph 15.01.B.4:

  5. The Application for Payment form to be used on this Project is EJCDC® C-620. The Agency must approve all Applications for Payment before payment is made.

- SC-15.01.B.6 – Add new paragraph immediately after Paragraph 15.01.B.5:

  6. By submitting an Application for Payment, based in whole or in part on furnishing equipment or materials, Contractor certifies that such equipment and materials are compliant with Domestic Preference requirements. Manufacturer's Certification for material(s) satisfy these requirements. Refer to the Sample Language for Manufacturer's Certification provided in these Contract Documents.

- SC-15.01.C.2.d – Add the following new paragraph immediately after Paragraph 15.01.C.2.c:

  d. The materials presented for payment in an Application for Payment comply with Domestic Preference requirements.

- SC-15.01.D.1 – Delete paragraph in its entirety and insert the following in its place:

  The Application for Payment with Engineer's recommendations will be presented to the Owner and Agency for consideration. If both the Owner and Agency find the Application for Payment acceptable, the recommended amount less any reduction under the provisions of Paragraph 15.01.E will become due twenty (20) days after the Application for Payment is presented to the Owner, and the Owner will make payment to the Contractor.

- SC-15.02.A – Amend paragraph by striking out the following text: "7 days after".

- SC-15.03.A – Modify by adding the following after the last sentence:

  Contractor shall also submit the Contractor's Certification of Compliance certifying that to the best of the Contractor's knowledge and belief all Iron and Steel products, Manufactured Products, and Construction Materials proposed in the Shop Drawings, Change Orders, and Partial Payment Estimates, and those installed for the Project, comply with Domestic Preference requirements.

- SC-18.11 – Add new paragraph immediately after Paragraph 18.10:

  18.11 *Tribal Sovereignty*

  A. No provision of this Agreement will be construed by any of the signatories

as abridging or debilitating any sovereign powers of the *[insert name of Tribe]* Tribe; affecting the trust-beneficiary relationship between the Secretary of the Interior, Tribe, and Indian landowner(s); or interfering with the government-to-government relationship between the United States and the Tribe.

☐ SC-19 – Add the following new Article 19 immediately after Article 18:

Article 19 - FEDERAL REQUIREMENTS

19.01 *Agency Not a Party*

A. This Contract is expected to be funded in part with funds provided by Agency. Neither Agency, nor any of its departments, entities, or employees, is a party to this Contract.

19.02 *Contract Approval*

A. Owner and Contractor will furnish Owner's attorney such evidence as required so that Owner's attorney can complete and execute the "Certificate of Owner's Attorney" before Owner submits the executed Contract Documents to Agency for approval. Refer to Certificate of Owner's Attorney and Agency Concurrence provided in these Contract Documents.

B. Agency concurrence is required on both the Bid and the Contract before the Contract is effective.

19.03 *Conflict of Interest*

A. Contractor may not knowingly contract with a Supplier or Manufacturer if the individual or entity who prepared the Drawings and Specifications has a corporate or financial affiliation with the Supplier or Manufacturer. Owner's officers, employees, or agents shall not engage in the award or administration of this Contract if a conflict of interest, real or apparent, would be involved. Such a conflict would arise when: (i) the employee, officer or agent; (ii) any member of their immediate family; (iii) their partner or (iv) an organization that employs, or is about to employ, any of the above, has a financial interest or other interest in or a tangible personal benefit from the Contractor. Owner's officers, employees, or agents shall neither solicit nor accept gratuities, favors or anything of monetary value from Contractor or subcontractors.

19.04 *Gratuities*

A. If Owner finds after a notice and hearing that Contractor, or any of Contractor's agents or representatives, offered or gave gratuities (in the form of entertainment, gifts, or otherwise) to any official, employee, or agent of Owner or Agency in an attempt to secure this Contract or favorable treatment in awarding, amending, or making any determinations related to the performance of this Contract, Owner may, by written notice to Contractor, terminate this Contract. Owner may also pursue other rights and remedies that the law or this Contract provides. However, the existence of the facts on which Owner bases such findings shall be an issue and may be reviewed in proceedings under the dispute resolution provisions of this Contract.

B. In the event this Contract is terminated as provided in paragraph 19.04.A, Owner may pursue the same remedies against Contractor as it could pursue in the event of a breach of this Contract by Contractor. As a penalty, in addition to any other damages to which it may be entitled by law, Owner may pursue exemplary damages in an amount (as determined by Owner) which shall not be less than three nor more than ten times the costs Contractor incurs in providing any such gratuities to any such officer or employee.

19.05 *Small, Minority and Women's Businesses*

A. If Contractor intends to let any subcontracts for a portion of the work, Contractor will take all necessary affirmative steps to assure that minority businesses, women's business enterprises, and labor surplus area firms are used when possible. Affirmative steps will include:

1. Placing qualified small and minority businesses and women's business enterprises on solicitation lists;
2. Assuring that small and minority businesses, and women's business enterprises are solicited whenever they are potential sources;
3. Dividing total requirements, when economically feasible, into smaller tasks or quantities to permit maximum participation by small and minority businesses, and women's business enterprises;
4. Establishing delivery schedules, where the requirement permits, which encourage participation by small and minority businesses, and women's business enterprises;
5. Using the services and assistance, as appropriate, of such organizations as the Small Business Administration and the Minority Business Development Agency of the Department of Commerce.

19.06 *Anti-Kickback*

A. Contractor shall comply with the Copeland Anti-Kickback Act (40 U.S.C. 3145) as supplemented by Department of Labor regulations (29 CFR part 3, "Contractors and Subcontractors on Public Buildings or Public Works Financed in Whole or in Part by Loans or Grants of the United States"). The Act provides that Contractor or subcontractor shall be prohibited from inducing, by any means, any person employed in the construction, completion, or repair of public facilities, to give up any part of the compensation to which they are otherwise entitled. Owner shall report all suspected or reported violations to Agency.

19.07 *Clean Air Act (42 U.S.C. 7401-7671q.) and the Federal Water Pollution Control Act (33 U.S.C. 1251-1387), as amended*

A. Contractor to agree to comply with all applicable standards, orders or regulations issued pursuant to the Clean Air Act (42 U.S.C. 7401-7671q) and the Federal Water Pollution Control Act as amended (33 U.S.C. 1251-1387). Violations must be reported to the federal awarding agency and the Regional Office of the Environmental Protection Agency (EPA).

19.08 *Equal Employment Opportunity*

A. The Contract is considered a federally assisted construction contract. Except as otherwise provided under 41 CFR part 60, all contracts that meet the definition of "federally assisted construction contract" in 41 CFR part 60-1.3 must include the equal opportunity clause provided under 41 CFR 60-1.4(b), in accordance with Executive Order 11246, "Equal Employment Opportunity" (30 FR 12319, 12935, 3 CFR part, 1964-1965 Comp., p. 339), as amended by Executive Order 11375, "Amending Executive Order 11246 Relating to Equal Employment Opportunity," and implementing regulations at 41 CFR part 60, "Office of Federal Contract Compliance Programs, Equal Employment Opportunity, Department of Labor."

19.09 *Byrd Anti-Lobbying Amendment (31 U.S.C. 1352)*

A. Contractors that apply or bid for an award exceeding $100,000 must file the required certification (RD Instruction 1940-Q Exhibit A-1). The Contractor certifies to the Owner and every subcontractor certifies to the Contractor 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 the Contract if it is covered by 31 U.S.C. 1352. The Contractor and every subcontractor must 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 Owner. Necessary certification and disclosure forms shall be provided by Owner.

19.10 Environmental Requirements

A. When constructing a Project involving trenching and/or other related earth excavations, Contractor shall comply with the following environmental conditions:

1. Wetlands – When disposing of excess, spoil, or other Construction Materials on public or private property, Contractor shall not fill in or otherwise convert wetlands.
2. Floodplains – When disposing of excess, spoil, or other Construction Materials on public or private property, Contractor shall not fill in or otherwise convert 100-year floodplain areas (Standard Flood Hazard Area) delineated on the latest Federal Emergency Management Agency Floodplain Maps, or other appropriate maps, e.g., alluvial soils on NRCS Soil Survey Maps.
3. Historic Preservation - Applicants shall ensure that Contractors maintain a copy of the following inadvertent discovery plan onsite for review:

    a. If during the course of any ground disturbance related to any Project, any post review discovery, including but not limited to, any artifacts, foundations, or other indications of past human occupation of the area are uncovered, shall be protected by complying with 36 CFR § 800.13(b)(3) and (c) and shall include the following:

        i. All Work, including vehicular traffic, shall immediately stop within a 50 ft. radius around the area of discovery. The Contractor shall ensure barriers are established to protect the area of discovery and notify the Engineer to contact the appropriate RD personnel. The Engineer shall engage a Secretary of the Interior (SOI) qualified professional archeologist to quickly assess the nature and scope of the discovery; implement interim measures to protect the discovery from looting and vandalism; and establish broader barriers if further historic and/or precontact properties, can reasonably be expected to occur.

        ii. The RD personnel shall notify the appropriate RD environmental staff member, the Federal Preservation Officer (FPO), and State Historic Preservation Office (SHPO) immediately. Indian tribe(s) or Native Hawaiian Organization (NHOs) that have an interest in the area of discovery shall be contacted immediately. The SHPO may require additional tribes or NHOs who may have an interest in the

area of discovery also be contacted. The notification shall include an assessment of the discovery provided by the SOI qualified professional archeologist.

iii. When the discovery contains burial sites or human remains, the Contractor shall immediately notify the appropriate RD personnel who will contact the RD environmental staff member, FPO, and the SHPO. The relevant law enforcement authorities shall be immediately contacted by onsite personnel to reduce delay times, in accordance with tribal, state, or local laws including 36 CFR part 800.13; 43 CFR part 10, subpart B; and the Advisory Council on Historic Preservation's Policy Statement Regarding treatment of Burial Sites, Human Remains, or Funerary Objects (February 23, 2007).

iv. When the discovery contains burial sites or human remains, all construction activities, including vehicular traffic shall stop within a 100 ft. radius of the discovery and barriers shall be established. The evaluation of human remains shall be conducted at the site of discovery by a SOI qualified professional. Remains that have been removed from their primary context and where that context may be in question may be retained in a secure location, pending further decisions on treatment and disposition. RD may expand this radius based on the SOI professional's assessment of the discovery and establish broader barriers if further subsurface burial sites, or human remains can reasonably be expected to occur. RD, in consultation with the SHPO and interested tribes or NHOs, shall develop a plan for the treatment of native human remains.

v. Work may continue in other areas of the undertaking where no historic properties, burial sites, or human remains are present. If the inadvertent discovery appears to be a consequence of illegal activity such as looting, the onsite personnel shall contact the appropriate legal authorities immediately if the landowner has not already done so.

vi. Work may not resume in the area of the discovery until a notice to proceed has been issued by RD. RD shall not issue the notice to proceed until it has determined that the appropriate local protocols and consulting parties have been consulted.

vii. Inadvertent discoveries on federal and tribal land shall follow the processes required by the federal or tribal entity.

4. Endangered Species – Contractor shall comply with the Endangered

Species Act, which provides for the protection of endangered and/or threatened species and critical habitat. Should any evidence of the presence of endangered and/or threatened species or their critical habitat be brought to the attention of Contractor, Contractor will immediately report this evidence to Owner and a representative of Agency. Construction shall be temporarily halted pending the notification process and further directions issued by Agency after consultation with the U.S. Fish and Wildlife Service.

5. Mitigation Measures – The following environmental mitigation measures are required on this Project: *[Insert mitigation measures from the Letter of Conditions here]*.

19.11 *Contract Work Hours and Safety Standards Act (40 U.S.C. 3701-3708)*

A. Where applicable, for contracts awarded by the Owner in excess of $100,000 that involve the employment of mechanics or laborers, the Contractor will comply with 40 U.S.C. 3702 and 3704, as supplemented by Department of Labor regulations (29 CFR part 5). Under 40 U.S.C. 3702 of the Act, the Contractor will compute the wages of every mechanic and laborer on the basis of a standard work week of 40 hours. Work in excess of the standard work week is permissible provided that the worker is compensated at a rate of not less than one and a half times the basic rate of pay for all hours worked in excess of 40 hours in the work week. The requirements of 40 U.S.C. 3704 are applicable to construction work and provide that no laborer or mechanic will be required to work in surroundings or under working conditions which are unsanitary, hazardous or dangerous. These requirements do not apply to the purchases of supplies or materials or articles ordinarily available on the open market, or contracts for transportation or transmission of intelligence.

19.12 *Debarment and Suspension (Executive Orders 12549 and 12689)*

A. A contract award (see 2 CFR 180.220) must not be made to parties listed on the governmentwide exclusions in the System for Award Management (SAM), in accordance with the OMB guidelines at 2 CFR part 180 that implement Executive Orders 12549 (3 CFR part 1986 Comp., p. 189) and 12689 (3 CFR part 1989 Comp., p. 235), "Debarment and Suspension." SAM Exclusions contains the names of parties debarred, suspended, or otherwise excluded by agencies, as well as parties declared ineligible under statutory or regulatory authority other than Executive Order 12549.

19.13 *Procurement of recovered materials*

A. The Contractor will comply with 2 CFR 200.322, "Procurement of recovered materials."

19.14 *Domestic Preference*

A. Build America, Buy America Act (BABAA). All Iron and Steel Products, Manufactured Products, and Construction Materials used in this project must comply with the Build America, Buy America Act (BABAA) requirements mandated by Title IX of the Infrastructure Investment and Jobs Act (IIJA), Pub. L. 117-58, §§ 70901-70953. Aggregates such as stone, sand, or gravel do not apply to BABAA

B. The following waivers apply to this Contract:

1. BABAA *De Minimis, Small Grants and Minor Components*
2. *[add project specific waivers as applicable].*

19.15 *Telecommunications and Video Surveillance Services or Equipment Prohibitions*

A. The telecommunication and video surveillance services and equipment prohibitions under 2 CFR 200.216 apply to this contract. This contract may not be used to procure or obtain equipment, services, or systems that uses covered telecommunications equipment or services as a substantial or essential component of any system, or as critical technology as part of any system. Covered telecommunications equipment is:

1. Telecommunications equipment produced by Huawei Technologies Company or ZTE Corporation (or any subsidiary or affiliate of such entities).
2. Video surveillance and telecommunications equipment produced by Hytera Communications Corporation, Hangzhou Hikvision Digital Technology Company, or Dahua Technology Company (or any subsidiary or affiliate of such entities).
3. Telecommunications or video surveillance services provided by such entities or using such equipment.
4. Telecommunications or video surveillance equipment or services produced or provided by an entity that the Secretary of Defense, in consultation with the Director of the National Intelligence or the Director of the Federal Bureau of Investigation, reasonably believes to be an entity owned or controlled by, or otherwise connected to, the government of a covered foreign country.

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WORK CHANGE DIRECTIVE NO.: [Number of Work Change Directive]

Owner:	Owner's Project No.:
Engineer:	Engineer's Project No.:
Contractor:	Contractor's Project No.:
Project:	
Contract Name:	
Date Issued:	Effective Date of Work Change Directive:

Contractor is directed to proceed promptly with the following change(s):

Description:

[Description of the change to the Work]

Attachments:

[List documents related to the change to the Work]

Purpose for the Work Change Directive:

[Describe the purpose for the change to the Work]

Directive to proceed promptly with the Work described herein, prior to agreeing to change in Contract Price and Contract Time, is issued due to:

Notes to User—Check one or both of the following

☐ Non-agreement on pricing of proposed change. ☐ Necessity to proceed for schedule or other reasons.

Estimated Change in Contract Price and Contract Times (non-binding, preliminary):

Contract Price: $ _____ **[increase] [decrease] [not yet estimated]**.

Contract Time: _____ days **[increase] [decrease] [not yet estimated]**.

Basis of estimated change in Contract Price:

☐ Lump Sum ☐ Unit Price ☐ Cost of the Work ☐ Other

	Recommended by Engineer	Authorized by Owner
By:		
Title:		
Date:		

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FIELD ORDER NO.: [Number of Field Order]

Owner:	Owner's Project No.:
Engineer:	Engineer's Project No.:
Contractor:	Contractor's Project No.:
Project:	
Contract Name:	
Date Issued:	Effective Date of Field Order:

Contractor is hereby directed to promptly perform the Work described in this Field Order, issued in accordance with Paragraph 11.04 of the General Conditions, for minor changes in the Work without changes in Contract Price or Contract Times. If Contractor considers that a change in Contract Price or Contract Times is required, submit a Change Proposal before proceeding with this Work.

Reference:

Specification Section(s):

Drawing(s) / Details (s):

Description:

[Description of the change to the Work]

Attachments:

[List documents supporting change]

Issued by Engineer

By: _____

Title: _____

Date: _____

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ATTACHMENT A.3 – SAMPLE LANGUAGE FOR CONTRACTOR'S CERTIFICATION OF COMPLIANCE

Notes to User:

1. This attachment provides sample language that the Contractor can use to certify compliance with the Build America Buy America Act (BABAA) requirements. The language can be modified.

Modification Example: If the project is subject to AIS, the BABAA reference should be replaced with language such as "American Iron and Steel (AIS) requirements mandated by Section 746 of Title VII of the Consolidated Appropriations Act of 2017 and subsequent annual appropriations for WWD programs."

2. The certification should be on letterhead and should be signed and dated by an authorized company representative.

3. A certification is to be provided by Contractor to Engineer for delivery to the Owner and Agency prior to final payment.

Project Name

Owner / Applicant

Contract Number

I hereby certify, that to the best of my knowledge and belief, all Iron and Steel products, Manufactured Products, and Construction Materials installed for this project by my company and by any and all subcontractors and Manufacturers my company has contracted with for this project comply with the Build America, Buy America Act (BABAA) requirements under Title IX of the Infrastructure Investment and Jobs Act (IIJA), Pub. L. 117-58, §§ 70901-70953 or are the subject of a waiver approved by the Secretary of Agriculture or designee.

_____ _____

Name of Contractor Authorized Representative Date

Contractor Company Name

Contractor Address

ATTACHMENT A.4 – SAMPLE LANGUAGE FOR MANUFACTURER'S CERTIFICATION OF COMPLIANCE

Notes to User:

1. This attachment provides sample language for the Manufacturer's Certification of Compliance with Domestic Preference requirements.

2. Contractor should ensure that Engineer has an approved Manufacturers' Certification prior to any domestic preference item being delivered to the project site.

3. The Manufacturer's Certification must be on letterhead and should indicate the specific item being certified, reference which domestic preference requirement is being certified, and be signed by an authorized company representative.

4. The Manufacturer's Certification may include multiple domestic preference requirements. It is important for the governing domestic preference requirement (whether AIS, BABAA or other) to be clearly included within the certification.

Date:

Company Name:

Company
Address:

Subject: Domestic Preference Requirement Certification for {*Owner's Name* and *Project Name (City, State)},* and Contract Number

I hereby certify that the following product(s) and / or material(s) shipped or provided for the subject project are in full compliance with the Build America, Buy America Act (BABAA) requirements under Title IX of the Infrastructure Investment and Jobs Act (IIJA), Pub. L. 117-58, §§ 70901-70953.

[List common name of items, products and/or materials]

These products and/or materials were manufactured in [Provide location(s) of manufacturing]

[Include signature of authorized representative]

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PART 1 GENERAL

01.1.01 DESCRIPTION

A. The Contractor shall provide all labor, materials, equipment, supplies, and appurtenances necessary to complete the work in accordance with the Contract Documents. The work to be performed under this contract generally consists of:

1. Base Bid:

a. The work generally consists of:

96" Storm Sewer Installation and Removal or Abandonment of existing CMP

B. The work for all Bid Packages shall also include other necessary and appurtenant items as specified herein and shown on the Drawings.

01.1.02 INTENT OF THE CONTRACT

A. The intent of the Contract is to provide for construction and completion of the Project in every detail as described in the Drawings and Specifications.

1. It is also intended and will be expected that the work be prosecuted diligently and pressed vigorously to early completion, with due regard being given to public interests, as well as to the obligations and rights of all other parties concerned.

2. By the terms of the Contract, the Contractor assumes full responsibility for performance of the work and agrees to furnish all labor, materials, equipment, tools, supplies, transportation, operator training and other incidentals necessary or convenient for successful completion of the Project. All work shall be turned over to the Owner in a complete and undamaged state.

B. Realizing that it would not be practical to fully describe every detail or to make specific allowances for all probable exceptions and contingencies, it is intended that the Owner's Representative have sufficient executive authority to administer the Contract with discretion, within its general scope, so as to rule out apparent discrepancies, fulfill intentions, and allow for the exigencies of construction, on the basis of Engineering judgment, giving careful consideration to all matters encumbering successful performance and completion of the Project.

C. The apparent silence of the Drawings and Specifications as to any detail, or the apparent omission of a detailed description concerning any point, shall be regarded as meaning that only the best general practice is to prevail and that materials and workmanship shall be first quality. Conversely, failure to itemize every allowable exception or condition does not mean that the governing provisions will be enforced equally under all conditions or on all parts of the work, as might be implied, it being understood that the Owner's Representative will decide all discretionary matters as they arise.

D. It is the Contractor's responsibility to locate sources for all materials specified herein and as necessary to complete the work. The Contractor shall bear all costs associated with the acquisition, transportation, preparation, fabrication and installation or erection of all materials or items necessary to complete the work.

01.1.03 TYPE OF CONTRACT

A. The work under this Contract is to be unit price work in accordance with **SECTION 00 72 00 – GENERAL CONDITIONS**.

01.1.04 RELATED SECTIONS

A. The following related sections are specified and included in other sections of these Specifications:

SECTION 00 21 13 INSTRUCTIONS TO BIDDERS
SECTION 00 22 13 SUPPLEMENTARY INSTRUCTIONS TO BIDDERS
SECTION 00 72 00 GENERAL CONDITIONS

01.1.05 WORK BY OTHERS

A. Construction observation and limited construction layout surveying will be performed by the Owner via the Owner's Representative. The Owner's Representative for this Project will be Interstate Engineering, Inc.

B. The Owner or Owner's Representative will perform or coordinate Quality Assurance testing for this Project.

01.1.06 ADVERSE WEATHER SHUTDOWN

A. The Contractor is advised that should he request an adverse weather shutdown and should such a shutdown be approved by the Engineer, all work on the project shall cease. The Engineer will not be available for work inspection during such shutdowns and any work completed by the Contractor during such a shutdown will not be accepted by the Engineer.

B. The Contractor shall also provide periodic road maintenance during this shutdown period. Materials for this maintenance shall be consistent with the conditions of the roadway. Paved streets shall be maintained with cold mix, and gravel streets shall be maintained, each of thickness satisfactory to carry the traffic without development of surface irregularities. Any costs related to road maintenance of the above will be the responsibility of the Contractor.

01.1.07 OWNER OCCUPANCY

A. The Owner shall have the right to occupy and use any completed or partially completed portion of the work where said occupancy will not encumber the completion of any remaining work.

B. Occupancy of completed or partially completed portions of the work shall not be deemed as acceptance of the work or as substantial completion.

01.1.08 MATERIALS

A. Unless otherwise stated, the Contractor shall be allowed to furnish only those materials listed in the construction documents.

B. All materials furnished for the work shall be new.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION

PART 1 GENERAL

01.1.01 DESCRIPTION

A. This section of the Project Manual describes the requirements for the Contractor's use of the site.

01.1.02 GENERAL

A. The Project will be constructed in rights-of-way or easements obtained by the Owner. The Contractor shall confine the work within the easement or right-of-way shown on the drawings and/or staked in the field.

B. The Contractor shall confine all operations to areas shown on the Drawings or specified herein.

1. The Contractor shall not encumber any area of the site with materials or equipment.
2. The Owner shall approve the use of temporary, on-site, storage areas.

C. The Contractor shall coordinate with the Owner for the use of any field or office facilities. The Contractor shall pay all costs associated with obtaining necessary field and office facilities in connection with the project. No additional cost shall be incurred by the Owner.

D. The protection and safekeeping of all equipment and materials stored on site or within the staging yard/area shall be the responsibility of the Contractor. No claim shall be made by the Contractor against the Owner or Engineer by reason of any act of an employee or trespasser.

E. The Contractor shall further provide access to the staging or yard areas should it be necessary or requested by the Owner. The Contractor shall comply and provide access by moving or removing any necessary equipment or materials. Accommodation and costs associated with the access shall be the responsibility of the Contractor.

F. Prior to placement of any equipment, materials, or facilities, the Contractor shall obtain, in writing, permission from the property owner. The Contractor shall be responsible for all costs in connection with acquisition of any additional work area, storage sites, site access, or temporary construction rights-of-way. The Contractor shall provide written evidence of permission to the Engineer when requested.

G. All driveways and alleys shall be opened to traffic as soon as practical. In no case shall a driveway or alley be blocked more than 72 consecutive hours.

H. Where the work will block dead end streets, alley or driveways, the Contractor shall advise all property Owners affected by the work prior to blocking access to or from the street or alley. The Contractor shall provide an alternate access route to businesses and homes during the blockage.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION

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PART 1 GENERAL

01.1.01 SUMMARY

This section describes the procedures for items of the work for which allowances are established in the Bidder's Proposal.

01.1.02 ALLOWANCE ITEMS

A lump sum amount is included in the Bidder's Proposal as an allowance for each of the following items:

Testing Laboratory Services (see **SCHEDULE 01 21 00 TESTING**)

01.1.03 PAYMENT OR ALLOWANCE ITEMS

A. The Contractor shall pay for the allowance items and submit to the Owner invoices for these payments with the monthly payment requests.

B. The Contractor will be reimbursed from the respective lump sum allowance in accordance with the legitimate invoices that are submitted.

C. The final lump sum amount for each allowance item will vary from that shown in the Bidder's Proposal and will be dependent on the costs of the approved invoices.

01.1.04 INELIGIBLE COSTS FOR ALLOWANCE ITEMS

A. Certain costs shall not be eligible for payment under allowance items.

B. These costs shall be considered included in the price bid for related work to the work and no additional compensation will be made therefor.

01.1.05 TESTING LABORATORY SERVICES

The costs of the following aspects of Testing Laboratory Services shall not be paid for under the lump sum allowance in the Bidder's Proposal for Testing Laboratory Services:

A. Mix Designs and Job Mix Formulas: Mix designs and job mix formulas shall be the responsibility of the Contractor.

B. Retesting: When initial tests indicate non-compliance with the Contract Documents, all subsequent retesting occasioned by the non-compliance, shall be performed by the same testing laboratory and the costs thereof will not be reimbursed to the Contractor.

C. Code Compliance Testing: Inspections and tests required by codes or ordinances, or by a plan approval authority, and made by a legally constituted authority, shall be the responsibility of and shall be paid for by the Contractor, unless otherwise provided in the contract Documents.

D. Contractor's Convenience Testing: Inspection or testing performed exclusively for the Contractor's convenience shall be the sole responsibility of the Contractor.

PART 2 PRODUCTS (NOT USED)

PART 3 CONSTRUCTION REQUIREMENTS (NOT USED)

END OF SECTION

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PART 1 GENERAL

01.1.01 SUMMARY

A. This section of the Project Manual describes the procedures for items of the work for which allowances are established in the Bidder's Proposal.

01.1.02 ALLOWANCE ITEMS

A. An amount is included in the Bidder's Proposal as an allowance for each of the following items:

1. Base Bid – Testing Allowance - $10,000

01.1.03 PAYMENT FOR ALLOWANCE ITEMS

A. The Contractor shall pay for the allowance items and submit to the Owner invoices for these payments with the monthly payment requests. The Contractor will be reimbursed from the respective allowance amount in accordance with the legitimate invoices, with no mark ups, that are submitted. The final amount for each allowance item will vary from that shown in the Bidder's Proposal and will be dependent on the costs of the approved invoices.

01.1.04 INELIGIBLE COSTS FOR ALLOWANCE ITEMS

A. Certain costs shall not be eligible for payment under allowance items. These costs shall be considered included in the price bid for related work to the work and no additional compensation will be made therefor.

B. Quality Control testing costs shall not be eligible for payment under allowance items.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION

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PART 1 GENERAL

01.1.01 DESCRIPTION

A. This section of the Project Manual describes the method of measurement and the basis of payment for the items included in the **BIDDER'S PROPOSAL.**

01.1.02 GENERAL

A. Realizing that it is not practical to list each item of work to be included in each of the pay items shown in the **BIDDER'S PROPOSAL**, Contractors shall have the discretion of assigning the costs of the work to specific bid items provided in the **BIDDER'S PROPOSAL**.

B. The descriptions of the work included for each of the pay items is provided for Contractor convenience.

C. The total amount bid for the work being equal to the sum of the bid items including alternates selected by the Owner but not including allowances shall be considered full compensation for providing all equipment, labor, materials, and tools necessary to complete the project as shown on the Drawings and specified herein.

01.1.03 PLAN QUANTITY

A. Plan Quantity, (P) in the Bid Form indicates items for which the estimated quantity shown is designated as a Plan Quantity, by inclusion of "(P)" after the estimated quantity.

1. The estimated quantity shown is based on the dimensions shown on the Drawings.
2. No measurement will be made for items designated as Plan Quantity unless substantial changes to the details and dimensions shown on the Drawings are made by the Owner or Engineer.
3. Where substantial changes are made by the Owner or Engineer, the basis of payment will be the measured quantity of the completed work.
    a. The units of measure shall be the units shown on the Bid Form.
    b. The unit price quote shall be applied to measured quantities.

01.1.04 METHOD OF MEASUREMENT

A. Lump Sum: The term "lump sum" when used as a unit of measurement shall mean complete payment for that item of work as shown on the Drawings and specified herein.

B. Length: All items that are measured by the linear measurement will be measured parallel to the axis of item being measured.

C. Individual Unit or Each: When a complete item or unit is specified as the unit of measurement the unit will be measured by physical count and will include all necessary accessories and appurtenances.

D. Area: Dimensions for area will be made parallel to the plane of the work that is being measured.

01.1.05 BASIS OF PAYMENT

A. Scope of Payment: The phrase "complete in place" when used in this Project Manual means completion of the quote item or units in accordance with the Drawings and as specified herein including the furnishing of all equipment, labor, materials, and tools necessary to complete the work.

B. The prices bid shall be considered full compensation for any work essential for the completion of the quote item, whether or not the specific material or operation is indicated on the Drawings or specified herein.

C. Bid Items:

ITEM No.	**1**	**96" Storm Sewer Pipe – FRP**
UNITS	LINEAR FOOT (LF)	
ITEM INCLUDES	The work necessary for 96" Fiberglass Reinforced (Polymer) Pipe storm sewer pipe replacement furnished and installed, complete in place, including pipe, bedding, detectable tape, trench excavation and backfill, dewatering, erosion control, testing, cleaning, post CCTV inspection, all labor, materials, equipment, trucking, supplies, and all other work necessary for the complete in place installation of the 96" storm sewer replacement as shown on the Drawings, and as specified in **DIVISION 31 EARTHWORK, DIVISION 32 – EXTERIOR IMPPOREMENTS,** and **DIVISION 33 – UTILITIES** of these Specifications.	
REMARKS	The unit price for this item shall also include the removal and disposal or abandonment as shown on the Plans, of existing storm sewer lines as necessary to complete the work. Will also include removing and replacing approximately 60 LF of fenceline at the Interstate 94 Right of Way.	

ITEM No.	**2**	**22.5° Bend - FRP**
UNITS	EACH (EA)	
ITEM INCLUDES	The work necessary for the installation of the fitting to achieve the specified degree bend in the 96" FRP storm sewer pipe replacement furnished and installed, complete in place, including pipe, bedding, detectable tape, trench excavation and backfill, dewatering, erosion control, testing, cleaning, post CCTV inspection, all labor, materials, equipment, trucking, supplies, and all other work necessary for the complete in place installation of the 96" storm sewer replacement as shown on the Drawings, and as specified in **DIVISION 31 EARTHWORK, DIVISION 32 – EXTERIOR IMPPOREMENTS** and **DIVISION 33 – UTILITIES** of these Specifications.	
REMARKS	The unit price for this item shall also include the removal and disposal or abandonment as shown on the Plans, of existing storm sewer lines as necessary to complete the work.	

ITEM No.	**3**	**45° Bend - FRP**
UNITS	EACH (EA)	
ITEM INCLUDES	The work necessary for the installation of the fitting to achieve the specified degree bend in the 96" FRP storm sewer pipe replacement furnished and installed, complete in place, including pipe, bedding, detectable tape, trench excavation and backfill, dewatering, erosion control, testing, cleaning, post CCTV inspection, all labor, materials, equipment, trucking, supplies, and all other work necessary for the complete in place installation of the 96" storm sewer replacement as shown on the Drawings, and as specified in **DIVISION 31 EARTHWORK, DIVISION 32 – EXTERIOR IMPPOREMENTS** and **DIVISION 33 – UTILITIES** of these Specifications.	
REMARKS	The unit price for this item shall also include the removal and disposal or abandonment as shown on the Plans, of existing storm sewer lines as necessary to complete the work.	

ITEM No.	4	60° Bend - FRP
UNITS	EACH (EA)	
ITEM INCLUDES	The work necessary for the installation of the fitting to achieve the specified degree bend in the 96" FRP storm sewer pipe replacement furnished and installed, complete in place, including pipe, bedding, detectable tape, trench excavation and backfill, dewatering, erosion control, testing, cleaning, post CCTV inspection, all labor, materials, equipment, trucking, supplies, and all other work necessary for the complete in place installation of the 96" storm sewer replacement as shown on the Drawings, and as specified in **DIVISION 31 EARTHWORK, DIVISION 32 – EXTERIOR IMPPOREMENTS** and **DIVISION 33 – UTILITIES** of these Specifications.	
REMARKS	The unit price for this item shall also include the removal and disposal or abandonment as shown on the Plans, of existing storm sewer lines as necessary to complete the work.	

ITEM No.	5	96" Storm Sewer Tee - FRP w/ Riser and Manhole Casting and Cover
UNITS	EACH (EA)	
ITEM INCLUDES	The work necessary for the installation of 96" X 36" Storm Sewer Tee – Fiberglass Reinforced Plastic with concrete riser and Type I Inlet furnished and installed, complete in place, including pipe, bedding, detectable tape, trench excavation and backfill, dewatering, erosion control, testing, cleaning, post CCTV inspection, all labor, materials, equipment, trucking, supplies, and all other work necessary for the complete in place installation of the 96" storm sewer as shown on the Drawings, and as specified in **DIVISION 31 EARTHWORK, DIVISION 32 – EXTERIOR IMPPOREMENTS** and **DIVISION 33 – UTILITIES** of these Specifications.	
REMARKS	The unit price for this item shall also include the vertical feet needed to get the Manhole to finished grade, encasing the fitting in no less than 13" of concrete to 3' beyond the joint on both sides, and the removal and disposal or abandonment as shown on the Plans, of existing storm sewer lines as necessary to complete the work.	

ITEM No.	6	WALL SLEEVE – FRP
UNITS	EACH (EA)	
ITEM INCLUDES	The work necessary for the installation of the fitting for attaching 96" FRP storm sewer pipe replacement furnished and installed, complete in place, including pipe, bedding, detectable tape, trench excavation and backfill, dewatering, erosion control, testing, cleaning, post CCTV inspection, all labor, materials, equipment, trucking, supplies, and all other work necessary for the complete in place installation of the 96" storm sewer replacement as shown on the Drawings, and as specified in **DIVISION 31 EARTHWORK, DIVISION 32 – EXTERIOR IMPPOREMENTS** and **DIVISION 33 – UTILITIES** of these Specifications.	
REMARKS	The unit price for this item shall also include the removal and disposal or abandonment as shown on the Plans, of existing storm sewer lines as necessary to complete the work.	

ITEM No.	7	15 Inch Polyvinyl Chloride Storm Sewer Pipe
UNITS	LINEAR FOOT (LF)	
ITEM INCLUDES	The work necessary for 15 Inch Polyvinyl Chloride Storm Sewer Pipe furnished and installed, complete in place, including pipe, bedding, detectable tape, trench excavation and backfill, dewatering, erosion control, testing, cleaning, post CCTV inspection, all labor, materials, equipment, trucking, supplies, and all other work necessary for the complete in place installation of the (Size) Inch Polyvinyl Chloride Storm Sewer Pipe as shown on the Drawings, and as specified in **DIVISION 31 EARTHWORK, DIVISION 32 – EXTERIOR IMPPOREMENTS** and **DIVISION 33 – UTILITIES** of these Specifications.	
REMARKS	The unit price for this item shall also include the removal and disposal or abandonment as shown on the Plans, of existing storm sewer lines as necessary to complete the work.	

ITEM No.	8	Cast in Place Concrete Structure
UNITS	EACH (EA)	
ITEM INCLUDES	The work necessary for the installation of the Concrete Structure with Inlet Catch Basin – Type A Cover installed, complete in place, including bedding, trench excavation and backfill, dewatering, erosion control, testing, cleaning, post CCTV inspection, all labor, materials, equipment, trucking, supplies and all other work necessary for the complete in place installation of the Cast in Place Concrete Structure as shown on the Drawings, and as specified in but not limited to **DIVISION 03 – CONCRETE, DIVISION 31 EARTHWORK, DIVISION 32 – EXTERIOR IMPPOREMENTS** and **DIVISION 33 – UTILITIES** of these Specifications. of these Specifications.	
REMARKS	The unit price for this item shall also include the removal and disposal of the existing sewer lines as necessary to complete the work as well as cleaning out debris potentially caused by the construction or not, in the existing pipe near the connection point at the Engineers discretion. Up to and not to exceed twenty feet (20') from the connection point. Will also include any and all site grading necessary to achieve positive drainage into the inlet and all erosion control deemed necessary per the NDDOT standards.	

ITEM No.	9	REPLACE (QUANTITY) INLET – TYPE 2 - DOUBLE
UNITS	EACH (EA)	
ITEM INCLUDES	The work necessary for the installation of a new Type 2 – Double Inlet on the new storm sewer pipe, complete in place, including concrete, bedding, detectable tape, trench excavation and backfill, dewatering, erosion control, testing, cleaning, post CCTV inspection, all labor, materials, equipment, trucking, supplies, and all other work necessary for the complete in place installation of the Inlet – Type 2 - Double as shown on the Drawings, and as specified in **DIVISION 03 – CONCRETE, DIVISION 31 EARTHWORK, DIVISION 32 – EXTERIOR IMPPOREMENTS** and **DIVISION 33 – UTILITIES** of these Specifications.	
REMARKS	The unit price for this item shall also include any castings or covers needed to complete the installation on the Inlet. Also included are the removal and disposal or abandonment as shown on the Plans, of existing sewer lines as necessary to complete the work. Alternative products for the 2 Type 2-Double Inlets may be submitted and used upon Engineer's Approval.	

ITEM No.	10	RECONNECT EXISTING STORM SEWER SERVICE
UNITS	EACH (EA)	
ITEM INCLUDES	The work necessary for the installation of the fitting for Reconnecting Existing less than 36" Storm Sewer Service to the new storm sewer pipe, furnished and installed, complete in place, including fittings, bedding, detectable tape, trench excavation and backfill, dewatering, erosion control, testing, cleaning, post CCTV inspection, all labor, materials, equipment, trucking, supplies, and all other work necessary for the complete in place reconnect of the existing storm sewer service to the new storm sewer pipe as shown on the Drawings, and as specified in **DIVISION 03 – CONCRETE, DIVISION 31 EARTHWORK, DIVISION 32 – EXTERIOR IMPPOREMENTS** and **DIVISION 33 – UTILITIES** of these Specifications.	
REMARKS	The pipe sizes for the existing services are based off the best available data at the time of design. The sizes shown on plans are: 12in, 15in, 18in, and 24". Contractor will be responsible to field verify sizes prior to reconnecting to ensure the proper materials are on site.	

ITEM No.	11	REMOVAL OF CONCRETE PAVEMENT
UNITS	SQUARE YARD (SY)	
ITEM INCLUDES	The work necessary for the removal and disposal of concrete pavement. All removals shall be saw cut through the full depth of the pavement. This saw cut shall be in a straight line and shall be cut to form a neat edge. Concrete pavement removed shall be disposed of by the contractor.	
REMARKS	The area removed shall be measured by the Engineer in the field. No more than 50 foot width. If the contractor removes less than 50 foot width, then the lesser width shall be measured and used to calculate the square yards of pavement removal for that area.	

ITEM No.	12	CURB AND GUTTER REMOVAL
UNITS	LINEAL FOOT (LF)	
ITEM INCLUDES	The work necessary for the removal and disposal of all types of concrete curb and gutter. To include any excavation and backfilling. Furnishing all labor, materials, equipment, trucking, supplies, and all other work necessary for the complete in place removal of curb and gutter.	
REMARKS	The curb and gutter removed shall be measured by the Engineer in the field.	

ITEM No.	13	CURB AND GUTTER REPLACEMENT – TYPE I
UNITS	LINEAL FOOT (LF)	
ITEM INCLUDES	The work necessary for the installation replacing the curb and gutter furnished and installed, complete in place. Including all labor, materials, equipment, trucking, supplies, and all other work necessary for the complete in place installation of the curb and gutter replacement as shown on the Drawings, and as specified in but not limited to **DIVISION 03 – CONCRETE** of these Specifications.	
REMARKS	The curb and gutter shall be measured along the top of the in-place curb and gutter, complete in place and accepted by the Engineer in the field.	

ITEM No.	14	CURB AND GUTTER MOUNTABLE – TYPE I
UNITS	LINEAL FOOT (LF)	
ITEM INCLUDES	The work necessary for the installation replacing the curb and gutter furnished and installed, complete in place. Including all labor, materials, equipment, trucking, supplies, and all other work necessary for the complete in place installation of the curb and gutter replacement as shown on the Drawings, and as specified in but not limited to **DIVISION 03 – CONCRETE** of these Specifications.	
REMARKS	The curb and gutter shall be measured along the top of the in-place curb and gutter, complete in place and accepted by the Engineer in the field.	

ITEM No.	15	REMOVAL OF ASPHALT PAVEMENT
UNITS	SQUARE YARD (SY)	
ITEM INCLUDES	The work necessary for the removal and disposal of asphalt pavement. All removals shall be saw cut through the full depth of the pavement. This saw cut shall be in a straight line and shall be cut to form a neat edge. Asphalt pavement removed shall be disposed of by the contractor.	
REMARKS	The area removed shall be measured by the Engineer in the field. No more than 50 foot width. If the contractor removes less than 50 foot width, then the lesser width shall be measured and used to calculate the square yards of pavement removal for that area.	

ITEM No.	16	PAVEMENT REPLACEMENT - ASPHALT SECTION 1
UNITS	SQUARE YARD (SY)	
ITEM INCLUDES	The work necessary for the installation of replacing the Asphalt furnished and installed, complete in place. Including all labor, materials, equipment, trucking, supplies, and all other work necessary for the complete in place installation of the Asphalt Section 1 replacement as shown on the Drawings, and as specified in but not limited to **DIVISION 31 EARTHWORK, and DIVISION 32 EXTERIOR IMPROVEMENTS** of these Specifications.	
REMARKS	All methods and material shall conform to the requirements for Hot Bituminous Pavement, Aggregate Base Course Class 5, Tack Coat, and Fog Seal as specified in "Standard Specifications for Road and Bridge Construction", 2024 Edition as published by the NDDOT, and all supplemental specifications.	

ITEM No.	17	PAVEMENT REPLACEMENT - CONCRETE SECTION 2
UNITS	SQUARE YARD (SY)	
ITEM INCLUDES	The work necessary for the installation of replacing the Concrete 5in furnished and installed, complete in place. Including all labor, materials, equipment, trucking, supplies, and all other work necessary for the complete in place installation of the Pavement Replacement - Concrete Section 2 as shown on the Drawings, and as specified in but not limited to **DIVISION 03 – CONCRETE, DIVISION 31 EARTHWORK, and DIVISION 32 EXTERIOR IMPROVEMENTS** of these Specifications.	
REMARKS	The material shall conform to the requirements for Concrete as specified in "Standard Specifications for Road and Bridge Construction", 2024 Edition as published by the NDDOT, and all supplemental specifications.	

ITEM No.	18	FLOWABLE FILL
UNITS	CUBIC YARD (CY)	
ITEM INCLUDES	The work necessary for the installation of the placement of Flowable Fill, complete in place, including dewatering, testing, all labor, materials, equipment, trucking, supplies, and all other work necessary for the complete the installation of Flowable Fill as shown on the Drawings, and as specified in but not limited to **DIVISION 03 – CONCRETE, and DIVISION 32 EXTERIOR IMPROVEMENTS** of these Specifications.	
REMARKS	This bid item is listed for the two areas specifically called out for Flowable Fill. Bid calculations based off a 96" pipe, 210' in length.	

ITEM No.	19	SEEDING CLASS I
UNITS	ACRE (ACRE)	
ITEM INCLUDES	The work necessary for the installation of the seeding class I furnished and installed, complete in place, including all labor, materials, equipment, trucking, supplies, watering, and all other work necessary for the complete in place installation of the seeding class I as shown on the Drawings, and as specified in but not limited to **DIVISION 32 EXTERIOR IMPROVEMENTS** of these Specifications.	
REMARKS	The area of the complete and in place seeding shall be paid for by the acre and measured by the Engineer in the field.	

ITEM No.	20	GENERAL REQUIREMENTS AND MOBILIZATION
UNITS	LUMP SUM (LS)	
ITEM INCLUDES	The preparatory work and on-going project coordination and management operations as specified in **DIVISION 00 – PROCUREMENT AND CONTRACTING REQUIREMENTS** and **DIVISION 01 – GENERAL REQUIREMENTS** of these Specifications including, but not limited to: 1. The movement of personnel, equipment, supplies and incidentals to the project site 2. The establishment of all offices, buildings and other facilities necessary for work on the project 3. Bonds and Insurance for the contract; except Railroad Protective Insurance 4. Other work and operations that must be performed or costs incurred before beginning contract work 5. Mobilization costs for subcontracted work 6. Preparation of as-built drawings 7. All costs associated with requirements by any funding agency or agencies.	
REMARKS	The Lump Sum Bid for GENERAL REQUIREMENTS AND MOBILIZATION shall not exceed 12% of the contract awarded. Partial payments for GENERAL REQUIREMENTS AND MOBILIZATION will be made based on the lump sum contract unit price as follows: 1. 25% of the amount bid for Mobilization will be paid when 5% of the Contract amount is paid for the Contract items and/or invoiced material in storage. 2. Subsequent mobilization payments will be based on percent of construction completed and accepted, excluding previous mobilization payments..	

ITEM No.	21	TESTING LABORATORY ALLOWANCE
UNITS	LUMP SUM (LS)	
ITEM INCLUDES	An allowance for Testing Laboratory	
REMARKS	**TESTING LABORATORY** will be paid by Invoice from Testing Company. Payment for work under this item will be in accordance with the provisions in but not limited to **DIVISION 01 – GENERAL REQUIREMENTS** of these Specifications.	

ITEM No.	22	TRAFFIC CONTROL
UNITS	LUMP SUM (LS)	
ITEM INCLUDES	The work necessary for the traffic control including all traffic control devices, installation, maintenance, Traffic control supervisor as required, removal at project finish, furnishing all materials, equipment, labor, and incidentals to complete the work as specified. and all other work necessary for the complete in place installation of the 96" storm sewer replacement as shown on the Drawings, and as specified in but not limited to **DIVISION 01 - TRAFFIC CONTROL** of these Specifications.	
REMARKS	Construction traffic control shall be paid for at the lump sum contract price.	

ITEM No.	23	REMOVAL OF EXISTING 96" STORM SEWER PIPE
UNITS	LUMP SUM (LS)	
ITEM INCLUDES	The work necessary for the Removal of the Existing 96" Storm Sewer Pipe located in the East 40' of Lot 1 Block 1 of Bender's First Addition and Lot 3 of Uncle Bob's Second Addition, including testing, all labor, materials, equipment, trucking, supplies, restoration, and all other work necessary for the complete in place removal of existing pipe as shown on the Drawings, and as specified in but not limited to **DIVISION 32 EXTERIOR IMPROVEMENTS** of these Specifications.	
REMARKS	Excavation and Removal of the existing pipe and using of Flowable Fill in the existing pipe are the two acceptable methods for this item. A combination of the two methods is also acceptable. Contractor will be responsible to document and provide a record drawing if both methods are used.	

ITEM No.	24	CLEARING OUTLET CHANNEL
UNITS	LUMP SUM (LS)	
ITEM INCLUDES	The work necessary for the Clearing Outlet Channel to gain positive drainage, complete in place, including testing, all labor, materials, equipment, any restoration, trucking, supplies, and all other work necessary for the complete in place clearing outlet channel as shown on the Drawings, and as specified in but not limited to **DIVISION 32 EXTERIOR IMPROVEMENTS** of these Specifications.	
REMARKS	The Outlet Channel is approximately 80LF and consists of Rock and debris. Contractor is responsible for creating and maintaining a SWPPP.	
ITEM No.	25	TEMPORARY ACCESS
UNITS	LUMP SUM (LS)	
ITEM INCLUDES	The work necessary for the Temporary Access to grant exit and entrance to the hotel throughout the project, complete in place, including testing, all labor, materials, equipment, any restoration, seeding, trucking, supplies, and all other work necessary for the complete in place clearing outlet channel as shown on the Drawings, and as specified in but not limited to **DIVISION 31 EARTHWORK and 32 EXTERIOR IMPROVEMENTS** of these Specifications.	
REMARKS	Temporary Access notes on Section 20 Sheet 8 contain the following breakdown of estimated quantities included in the Lump Sum payment. The area measuring 8 ½' x 26' will be stripped of decorative rocks, sod, and topsoil. Approximately 8" of Class 5 Aggregate will be placed on fabric to act as the hotel access road. The existing parking lot curb and gutter must be covered to ensure protection and a 4" pipe to be used to ensure drainage. The temporary access can be removed once 24th St SW is fully reconstructed. 80% of the lump sum will be paid once it is in place. The remaining 20% will be paid when the Temporary Access is removed.	

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION

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PART 1 GENERAL

01.1.01 GENERAL

This section of the Project Manual describes the procedures for making modifications to the contract.

01.1.02 PROJECT MODIFICATIONS

A. Project Modifications: The Owner's Representative will issue a description of proposed changes in the Work that may or may not require adjustment to the Contract Sum or the Contract Time. If necessary, the description will include supplemental or revised Drawings and Project Manual.

B. There are three categories of Project Modifications: Supplemental Instruction, Proposal Request or Construction Change Directive:

1. Supplemental Instruction: The Owner's Representative will issue supplemental instructions authorizing Minor Changes in the Work, not involving adjustment to the Contract Sum or the Contract Time.

2. Proposal Requests: Proposal Requests issued by the Owner's Representative are for information only. The Contractor shall not consider them to be instructions either to stop work in progress or to execute the proposed change.

   a. Within the time frame noted in the request but in no case more than fourteen (14) calendar days after receipt of Proposal Request, the Contractor shall submit a quotation estimating cost adjustments to the Contract Sum and the Contract Time necessary to execute the change.

   b. The quotation shall include a list of quantities of products required or eliminated and unit costs, with total amount of purchases and credits to be made. If requested, furnish survey data to substantiate quantities.

   c. The quotation shall indicate applicable taxes, delivery charges, equipment rental, and amounts of trade discounts.

   d. Upon approval of the proposal request a Change Order will be prepared.

3. Construction Change Directive: Construction Change Directives instruct the Contractor to proceed with a change in the Work, for subsequent inclusion in a Change Order.

   a. Construction Change Directives contain a complete description of changes in the Work.

   b. Construction Change Directives designate the methods to be followed to determine changes in the Contract Sum or the Contract Time.

01.1.03 CHANGE ORDER PROCEDURES

A. Upon the Owner's approval of a Proposal Request, or completion of documentation of a Construction Change Directive, the Owner's Representative will issue a Change Order for signatures of Owner and Contractor on the form attached hereto at the end of this section

B. Documentation: The Contractor shall maintain detailed records on a time and material basis of work required by a Construction Change Directive.

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

PART 2 PRODUCTS (NOT USED)

PART 3 CONSTRUCTION REQUIREMENTS (NOT USED)

CHANGE ORDER

Change Order _____ **Date:** _____

NAME OF PROJECT: _____

_____

OWNER: _____

CONTRACTOR: _____

The following changes are hereby made to the CONTRACT DOCUMENTS:

DESCRIPTION:

Change in CONTRACT PRICE:

Original CONTRACT PRICE: $ _____

The CONTRACT PRICE due to this CHANGE ORDER will be **DECREASED/INCREASED** by $ _____

CONTRACT PRICE including previous CHANGE ORDER is: $ _____

The new CONTRACT PRICE including this CHANGE ORDER will be: $ _____

Change to CONTRACT TIME:

The CONTRACT NUMBER OF WORKING DAYS is **DECREASED/INCREASED** by _____

WORKING DAYS

Requested by: _____

Date

Recommended by: _____

Date

Approved by: _____

Date

The following items are to be [ADDED/DELETED] [to/from] the CONTRACT

ITEM

DEDUCT/ADD _____

ITEM

ADD/DELETE _____

NET CHANGE: _____

END OF SECTION

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PART 1 GENERAL

01.1.01 DESCRIPTION

A. This section of the Project Manual includes the procedures for preparing and submitting payment requests, also referred to as progressive estimates.

01.1.02 RELATED WORK SPECIFIED ELSEWHERE

A. The following items of related work are specified and included in other sections of this Project Manual:

SECTION 00 62 76	**APPLICATION FOR PAYMENT**
SECTION 00 65 00	**CLOSEOUT FORMS**
SECTION 00 72 00	**GENERAL CONDITIONS**
SECTION 01 22 19	**MEASUREMENT AND PAYMENT**
SECTION 01 29 73	**SCHEDULE OF VALUES**
SECTION 01 31 00	**PROJECT MANAGEMENT AND COORDINATION**
SECTION 01 77 00	**CLOSEOUT PROCEDURES**

01.1.03 PAYMENT APPLICATION TIMES

A. Progress payments will be submitted at a frequency of not less than one calendar month.

1. The application for payment must be submitted to the Owner's Representative at least ten (10) calendar days prior to the Owner's meeting at which the Contractor desires the application to be considered.
2. The Owner has regularly scheduled meetings each month.
3. The dates for submitting Progress Payment Application will be established during the Pre-Construction Conference.

B. The period covered by each Application for Payment starts on the day following the end of the preceding period and ends on the day of the application.

01.1.04 PAYMENT APPLICATION FORMS

A. Payment applications shall be made using the Engineers Joint Contract Documents Committee (EJCDC) Form C-620 "2013 Contractors Application for Payment" as provided in **SECTION 00 62 76 – APPLICATION FOR PAYMENT FORM**.

01.1.05 INITIAL APPLICATION FOR PAYMENT

A. Submittals that must precede or coincide with submittal of first Application for Payment include the following:

1. List of Subcontractors.
2. Contractor's Schedule of Values as outlined in Article 2 of the General Conditions and **SECTION 01 29 73 – SCHEDULE OF VALUES.**
3. Contractor's Construction Schedule.
4. List of Contractor's staff assignments.
5. Copies of authorizations, permits, and licenses from authorities having jurisdiction for performance of the work.
6. Data needed by Owner to acquire insurance.

01.1.06 APPLICATION PREPARATION

A. Complete every entry on form. Execute by a person authorized to sign legal documents on behalf of Contractor.

B. The Owner's Representative will return incomplete applications without action.

C. Each Application for Payment shall be consistent with previous applications and payments as certified by Owner's Representative and paid for by Owner.

D. Applications for payment shall conform to and include the following:

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

E. Submit three (3) signed original copies of each Application for Payment to Owner's Representative by a method ensuring receipt.

01.1.07 PROMPT PAYMENT OF SUBCONTRACTORS

A. North Dakota projects:

1. The Contractor must pay any Subcontractor within ten (10) days of receiving of payment from the Owner.
   a. The Contractor shall pay interest in the amount of 1½ % per month or any part of the month to the Subcontractor on any undisputed amount not paid on time.
   b. Notwithstanding the foregoing, the provisions set forth in Article 3.01G of the General Conditions take precedence with regard to Owner's obligations to the Subcontractor.

B. Montana projects:

1. The Contractor must pay any subcontractor within seven (7) days of receiving of payment from the Owner.
   a. The Contractor shall pay interest in the amount of 1½ % per month to the subcontractor on any undisputed amount not paid on time in accordance with Montana Code Annotated Title 28, Chapter 2, Part 21.
2. Likewise, higher subcontractors shall pay lower tier subcontractors within seven (7) days of receipt of payment from the Contractor or higher tier subcontractor.
   a. The higher tier subcontractor shall pay interest in the amount of 1 1/2% per month to the lower tier subcontractor on any undisputed amount not paid on time in accordance with MCA Title 28, Chapter 2, Part 21.

01.1.08 FINAL PAYMENT APPLICATION

A. The Contractor shall submit final Application for Payment with releases and supporting documentation not previously submitted and accepted, including, but not limited, to the following:

1. Evidence of completion of Project closeout requirements.
2. Insurance certificates for products and completed operations where required and proof that taxes, fees, and similar obligations were paid.
3. Contractor's Affidavit of Payment of Debts and Claims.
4. Consent of Surety to Final Payment.
5. Releases from property owners for work performed in staging areas or easements in accordance with **SECTION 01 31 00 – PROJECT MANAGEMENT AND COORDINATION.**
6. See **SECTION 00 65 00 – CLOSEOUT FORMS** and **SECTION 01 77 00 – CLOSEOUT PROCEDURES** for more information.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION

PART 1 GENERAL

01.1.01 DESCRIPTION

A. This section of the Project Manual describes the requirements for the submittal of the Contractor's schedule of values.

01.1.02 SUBMITTAL

A. The Contractor shall submit a typed Schedule of Values in duplicate within 10 days after date of Owner-Contractor Agreement.

1. Format: For Lump Sum items, the schedule of values for all Work is to include quantities and prices of items aggregating the Contract Price and is to subdivide the Work into component parts in sufficient detail to serve as the basis for progress payments during construction. Such prices will represent a true measure of the labor and materials required to perform the work and include an appropriate amount of overhead and profit applicable to each item of Work which will be confirmed in writing by Contractor at the time of submission.
2. Format: For unit cost items, identify quantities taken from Contract Documents multiplied by the unit cost to achieve the total for the item.
3. The schedule is to include an estimated monthly drawdown schedule for Contractor payment for the duration of the project.
4. Revise schedule to list approved Change Orders, with each Application for Payment.
5. The schedule will serve as a basis for payment when changes in quantities or the elimination of certain items are agreed upon by the Owner.

01.1.03 PAYMENT

A. Unless partial payments for any lump sum item are explicitly described in **SECTION 01 22 19 – MEASUREMENT AND PAYMENT**, no partial payment will be made on that item until an approved schedule of values for that item in which payment is requested is on file with the Engineer.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION

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PART 1 GENERAL

01.1.01 DESCRIPTION

A. This section of the Project Manual includes the Contractor's coordination of the work with Subcontractors, the Owner, and affected property and utility owners.

01.1.02 SUBMITTALS

A. The Contractor shall submit to the Owner and Engineer the following information as applicable to coordination activities:

1. Subsurface Information and Utilities.

   a. Records or logs of borings or test holes by the Contractor, if any.

   b. Results of exploratory excavations made to verify locations and nature, shape, dimensions, etc., of existing utilities and facilities. Where possible, indicate this information on a clean copy of Contract Drawings.

2. Field Relocation: Clearly show proposed relocation of new and existing facilities, or related work affected by the relocation, on a clean copy of the Contract Drawings and submit in accordance with **SECTION 01 33 00 – SUBMITTAL PROCEDURES**, prior to performing the relocation.

3. Connecting Work: Proposed methods of connecting new work to existing facilities, where not shown or specified.

4. Leases: Copy of leases and other agreements obtained from public agencies or private owners as required for the Contractor's staging and material storage areas.

5. Temporary Operations: Detailed plans for all temporary operations necessary to construct proposed facilities

01.1.03 CONTRACTOR CONTACT INFORMATION

A. The Contractor shall furnish to the Owner's Representative a list of the field superintendent, foreman, those responsible for the 24-hour maintenance of traffic control devices, and emergency contact person(s). Providing the data to the Owner's Representative does not release the Contractor from responsibility for 24-hour maintenance and protection of the project site.

B. This list shall include the following data:

1. Name of the individual(s).

2. Title

3. Phone numbers. In case of the person(s) responsible for emergencies and the maintenance of the traffic control devices these numbers must include one at which said person(s) can be reached 24 hours a day, 7 days a week, including Saturdays, Sundays, and Holidays.

01.1.04 COORDINATION WITH OTHER WORK

A. The Contractor is advised that other Contractors or private utility companies may be installing/relocating improvements such as power, lighting, natural gas, and communications during the time this project is under construction. The Contractor will coordinate the work on this Project so as not to impede work by others.

B. The Owner may perform additional work related to this project himself, or he may let other direct contracts therefore which shall contain General Conditions and General Requirements similar to these. The Contractor shall afford the other contractors who are parties to such direct contracts, (or Owner if he is performing the additional work himself), reasonable opportunity for the introduction and storage of materials and equipment and execution of work and shall properly connect and coordinate his work with theirs.

C. If any part of the Contractor's work depends on proper execution or results from the work of any such other Contractor (or Owner), the Contractor shall inspect and promptly report to the Owner and Engineer in writing any defects or deficiencies in such work that renders it unsuitable for such proper execution or results. His failure to so report shall constitute an acceptance of the other work as fit and proper for the execution of his work except as to defects and deficiencies which may appear in the other work after the execution of his work.

D. The Contractor shall do all cutting, fitting, and patching of his work that may be required to make its several parts come together properly and fit it to receive or be received by such other work. The Contractor shall not endanger any work of others by cutting, excavating, or otherwise altering their work and will only cut or alter their work with the written consent of the Engineer and the other contractors whose work will be affected.

E. If the performance of additional work by other Contractors or the Owner is not noted in the Contract Documents prior to the execution of the Contract, written notice thereof shall be given to the Contractor prior to starting any such additional work. If the Contractor believes that the performance of such additional work by Owner or others involves him in additional expense or entitles him to an extension of the contract time, he may make a claim, therefore.

F. The Contractor shall be responsible for all areas of the site used by him and all Subcontractors in performance of the work. He shall exert full control over the action of all employees and other persons with respect to the use and preservation of property and existing facilities, except such controls as may be specifically reserved to the owners or others.

G. The Contractor and all Subcontractors shall cooperate in the coordination of their separate activities in a manner that will provide the least interference with the Owner's operations and in the interfacing and connection of the separate elements of the overall project work. If any difficulty or dispute should arise in the accomplishment of the above, the problem shall be brought immediately to the attention of the Owner and Engineer. All Contractors working on this site are subject to this requirement for cooperation, and all shall abide by the Engineer's decision in resolving project coordination problems without additional cost to the Owner.

01.1.05 COORDINATION WITH LANDOWNERS

A. The Contractor must maintain ingress and egress to all landowners that may be affected by the project construction. If an access needs to be blocked or closed for any reason, the Contractor will notify all landowners 24-hours prior to the closure/limited use and complete work necessary to remove the blockage as soon as possible. In no case shall the property access be obstructed for more than 24-hours.

B. Before final payments will be authorized, the Contractor shall furnish the Owner written releases from property owners and/or public/private agencies where staging activities, or work within easements has been undertaken.

1. In the event the Contractor is unable to secure written releases, inform the Owner for reasons.

2. The Owner or its representatives will examine the site, and the Owner will direct the Contractor to complete work that may be necessary to satisfy terms of the easements.

3. Should the Contractor refuse to do this work, the Owner reserves the right to have it done by a separate contract and deduct the cost of same from the Contract amount or require the Contractor to furnish a satisfactory bond in a sum to cover legal claims for damages.

4. When the Owner is satisfied that work has been completed in agreement with the Contract Documents and term of easements, the right is reserved to waive the requirement for written release if Contractor's failure to obtain such statement is due to the grantor's refusal to sign, and this refusal is not based upon any legitimate claims that Contractor has failed to fulfill the terms of the easement or the Contractor is unable to contact or has had undue hardship in contacting the grantor.

01.1.06 WORKING NEAR UTILITIES

A. The Contractor is responsible for becoming familiar with all utilities on the site per **SECTION 01 71 00 – EXAMINATION AND PREPARATION** of these Specifications.

B. When the Contractor works near electrical power lines, the Contractor may make arrangements with the power company, at no expense to the Owner, to:

1. Temporarily shut off the power or utility.
2. Temporarily insulate the line(s).
3. By-pass the power or utility from the work area, or
4. Make other arrangements necessary for a safe workplace.

C. No warranty is made as to whether the utility will temporarily shut off power or insulate its line(s), or as to the fee charged for preparing a safe work area for the Contractor.

D. Construction operations adjacent to utility property shall not be commenced until arrangements satisfactory to the utility owner have been made by the Contractor for the protection of the utility's property and continuation of service.

1. Should any of the Contractor's equipment come in contact with or damage utility property in any way, even though there may be no apparent evidence of breakage or harm, the Contractor shall promptly notify the proper authorities.
2. The Contractor shall also cooperate with the utility owner or proper authority in determining damage and restoring interrupted services as may be needed.
3. Where contact is made with a utility, operations should be suspended immediately.
4. The Contractor shall vacate the site until the utility owner determines that it is safe to resume operations.

E. The Contractor shall employ special equipment or construction methods and hand labor, if necessary, to accomplish the work as planned adjacent to utility properties without damage thereto.

F. At no time shall the Contractor interfere with any persons engaged in protecting or moving utility property or in the operation of the utility.

01.1.07 OPERATION AND SHUTDOWN OF EXISTING FACILITIES

A. Continuous water and sewer service is of critical importance. The Contractor shall schedule and conduct activities to enable existing facilities to operate continuously, unless otherwise specified. Conduct work outside normal working hours as may be necessary to meet project schedule and avoid undesirable conditions within limits specified in the General and Supplementary Conditions.

B. The Contractor shall provide at least 2 days advance notice to the Owner of need to shut down a water line unless specified otherwise hereinafter. Do not proceed with work affecting a facility's operation without obtaining the Owner's advance approval of the need for, and duration of, such work.

C. The Contractor shall provide temporary devices, bypass pumping, temporary water, piping, equipment, and other similar items as may be required to accomplish the work and maintain continuous utility service. No water user shall be out of service for a period exceeding 8 hours. No sewer user shall be out of service for a period exceeding 4 hours.

01.1.08 TEMPORARY WATER SERVICE INTERRUPTION

A. In the event the Contractor will need to shut down water service to the water users, the Contractor will notify all of the affected customers in the area of an impending water service disruption a minimum of 48 hours prior to the shutdown. Notification shall be by written notification handed to the affected customers or by a door hanger.

01.1.09 CONNECTIONS TO EXISTING FACILITIES

A. The Contractor shall submit, well in advance of the connection, a schedule detailing the work to be performed in order that the Owner or Engineer may witness the shutdown, tie-in, and startup.

B. The schedule shall show downtime of the facility, equipment, materials, and tools required and the trades involved in the work.

C. The facility owner shall have the authority to stop, interrupt or prohibit work that will interfere with or jeopardize the continuous and reliable operation of the facility.

D. All operations of existing process equipment, valves, pumps, gates, or controls required for the work shall be performed by the facility owner's personnel.

E. All materials and equipment (including emergency equipment) necessary to expedite tie-ins shall be on hand prior to the shutdown or existing services or utilities.

F. Connections to existing facilities which are in service shall be thoroughly planned in advance, and all required equipment, materials, and labor shall be on hand at the time of undertaking the connections. All equipment, materials, and labor that the Contractor plans to have available shall be coordinated with the Owner and Engineer to ensure the work is done in the minimum amount of time.

G. Connections to existing utilities should be scheduled for early in the week to avoid utility personnel overtime in the event of a problem.

H. Work shall proceed continuously (around the clock) if necessary, to complete the connections in the minimum time. Operation of valves or other appurtenances on existing facilities, when required, shall be by or under the direct supervision of the Owner.

I. Existing valves or gates used to isolate certain structures may not be watertight and some leakage may occur. The Contractor shall provide the necessary temporary plugs and/or plumbing facilities to handle any leakage.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION

PART 1 GENERAL

01.1.01 DESCRIPTION

A. This section of the Project Manual describes the requirements for construction progress documentation.

01.1.02 SUBMITTAL SCHEDULE

A. The Contractor shall submit initial submittal schedule in accordance with the **SECTION 00 72 00 – GENERAL CONDITIONS** of the Contract and as follows:

1. Coordinate submittal schedule with the Subcontractors, Schedule of Values, and the list of products as well as the Contractor's Construction Schedule.
2. Prepare the schedule in chronological order and provide the following information:
    a. Scheduled date for the first submittal
    b. Related Section number
    c. Submittal category (Shop Drawings, Product Data, or Samples)
    d. Name of the Subcontractor
    e. Description of the part of the work covered
    f. Scheduled date for the Owner's Representative's final release

B. Following response to the initial submittal schedule, the Contractor shall print and distribute copies of the revised submittal schedule to the Owner's Representative, Owner, Subcontractors, and other parties required to comply with submittal dates indicated.

1. Copies shall be posted in the field office.
2. When revisions are made, the Contractor shall distribute to the same parties and post in the same locations.
3. Delete parties from distribution when they have completed their assigned portion of the work and are no longer involved in construction activities.

C. Revise the schedule after each meeting or activity where revisions have been recognized or made. Issue the updated schedule concurrently with the report of each meeting.

01.1.03 CONTRACTOR'S CONSTRUCTION SCHEDULE

A. The Contractor shall prepare and submit to the Owner's Representative prior to submission of each Application and Certificate for Payment, a construction schedule of the work activities from the Notice to Proceed until Substantial Completion.

B. A work activity is defined as an activity that requires substantial time and resources (manpower, equipment, and/or material) to complete and must be performed before the contract is considered complete.

C. The schedule shall indicate the sequence of work activities.

D. Each activity shall be identified with a description, start date, completion date, and duration. It shall include, but not be limited to, the following items, as appropriate to this contract:

1. Shop drawing review by the Owner's Representative
2. Material and Equipment
    a. Order
    b. Manufacture
    c. Delivery
    d. Installation

e. Check out

3. Performance tests and supervisory service activities
4. Excavation and grading
5. Concrete placement sequence
6. Construction of various facilities
7. Construction of various segments of utilities
8. Subcontractor's items of work
9. Allowance for inclement weather
10. Contract interfaces, date of Substantial Completion
11. Interfacing and sequencing with existing facilities and utilities
12. Sequencing of major construction activities
13. Milestones and completion dates

E. Following response to the initial submittal, the Contractor shall print and distribute copies of the revised construction schedule to the Owner's Representative, Owner, Subcontractors, and other parties required to comply with scheduled dates.

1. Post copies in the field office.
2. When revisions are made, distribute to the same parties and post in the same locations.

F. Delete parties from distribution when they have completed their assigned portion of the work and are no longer involved in construction activities.

G. Revise the schedule after each meeting, event, or activity where revisions have been recognized or made. Issue the updated schedule concurrently with the report of each meeting and with each application for payment.

H. Prepare and submit to the Owner's Representative within ten (10) days after substantial completion a detailed construction schedule for outstanding work and punch list items.

01.1.04 MEETINGS

A. Meetings will be scheduled by the Owner's Representative during project construction as deemed necessary.

1. The Contractor or a responsible representative who can bind the Contractor to a decision shall attend the meetings.

B. The following meetings shall be attended by a representative of the Contractor, Owner's Representative, and Owner:

1. Pre-construction meeting.
2. Weekly Progress meetings, as required.
3. Final walk-through meetings for substantial completion and final completion.

C. Notice of meetings to be attended by the Contractor, Owner and Owner's Representative will be sent to those required to attend and copies to interested parties such as governmental and funding agencies.

1. The Owner's Representative will send the notice of meetings and will prepare and distribute the meeting minutes.
2. Attendees of the meeting shall be responsible for the review of meeting minutes for completeness and correctness.
3. Comments shall be forwarded to the person that prepared the minutes.

4. After seven days of meeting minute distribution, or a deadline set forth otherwise, the meeting minutes will become a part of the project record.

D. Sections of the Specifications may require coordination meetings between the Contractor and the trade people performing the specified work.

1. The Contractor shall be responsible for sending notification of said meetings to the Owner's Representative and Subcontractors involved with the particular work item.

2. Owner's Representative is not required to attend these meetings unless specifically requested by the Contractor.

3. Contractor shall be responsible for preparation and distribution of meeting minutes.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION

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PART 1 GENERAL

01.1.01 DESCRIPTION

A. This section of the Project Manual includes administrative and procedural requirements for submittals required for performance of the work.

01.1.02 SUBMITTAL REQUIREMENTS SHALL BE MET

A. Failure to meet Submittal requirements to the satisfaction of the Engineer will constitute unsatisfactory performance of the work in accordance with the Contract Documents. The Engineer may recommend to the Owner that all or a portion of payments requested during the corresponding pay period be withheld until these requirements are met.

B. Materials incorporated into the project without the required submittals, are done so at the Contractor's risk.

01.1.03 RELATED WORK SPECIFIED ELSEWHERE

A. The following items of related work are specified and included in other sections of these Specifications:

SECTION 00 26 00 PROCUREMENT SUBSTITUTION PROCEDURES
SECTION 00 72 00 GENERAL CONDITIONS
SECTION 01 78 00 CLOSEOUT SUBMITTALS

01.1.04 DEFINITIONS

A. Shop drawings are drawings, diagrams, schedules, and other data specially prepared for the work by the Contractor or Subcontractor, Sub- Subcontractor, manufacturer, supplier, or distributor to illustrate some portion of the work.

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

C. Samples are physical examples that illustrate materials, colors, equipment, or workmanship and establish standards by which the work will be judged.

D. Coordination drawings show the relationship and integration of different construction elements that require careful coordination during fabrication or installation to fit in the space provided or to function as intended.

E. Manufacturer's Instructions include delivery, storage, handling, assembly, installation, adjustment, start-up, operation, maintenance, and finishing as applicable.

F. Field samples are full-size physical examples erected on-site to illustrate finishes, coatings, or finish materials. Field samples are used to establish the standard by which the work will be judged.

G. Mockups are full-size assemblies for review of construction, coordination, testing, or operation; they are not samples.

01.1.05 ADDITIONAL SUBMITTALS

A. The following submittals may be required and are included in other sections of the Contract Documents.

B. This list is not mean to be all inclusive, Contractor shall be responsible for submitting all material required by the Contract Documents.

C. Submittals not included herein:

Administrative Submittals - Refer to **SECTION 00 72 00 GENERAL CONDITIONS**, **DIVISION 00** and **DIVISION 01** for additional information.

a. Such submittals include, but are not limited to, the following:

i. List of Subcontractors.

ii. Health and safety plan, as required.

iii. Monthly cash flow requirements.

iv. Schedule of values.

v. Submittal Schedule.

vi. Construction progress schedule.

vii. Application and Certificate for Payment.

viii. Requests for Change Order.

2. Traffic Control Plan (if applicable) – Refer to **SECTION 01 55 26 TRAFFIC CONTROL** for additional information.

3. Temporary Water Plan (if applicable) – Refer to **SECTION 01 51 00 TEMPORARY WATER** for additional information.

4. Closeout Submittals – Refer to **SECTION 01 78 00 CLOSEOUT SUBMITTALS** for additional information.

a. Such submittals include, but are not limited to, the following:

i. Record drawings.

ii. O&M manuals.

iii. Warranties.

D. **Technical Provisions**

1. Reserved.

01.1.06 SUBMITTAL PROCEDURES

A. The Contractor shall coordinate preparation and processing of submittals with performance of construction activities.

B. The Contractor shall transmit each submittal sufficiently in advance of performance of related construction activities to avoid delay.

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 elements of the work so processing will not be delayed by the need to review submittals concurrently for coordination.

a. The Engineer reserves the right to withhold action on a submittal requiring coordination with other submittals until all related submittals are received.

3. To avoid the need to delay installation as a result of the time required to process submittals, allow sufficient time for submittal review, including time for re-submittals.

C. The Contractor shall place a permanent label or title block on each submittal for identification. Including the name of the entity that prepared each submittal on the label or title block.

1. Assign a reference number to each submittal and re-submittal.

2. Provide a space approximately 4 by 5 inches on the label or beside the title block on Shop Drawings to record the Contractor's review and approval markings and the action taken by the Contractor.

3. Include the following information on the label for processing and recording action taken.

a. Project name

b. Date

c. Name and address of the Engineer

d. Name and address of the Contractor

e. Name and address of the Subcontractor

f. Name and address of the supplier

g. Name of the manufacturer

h. Number and title of appropriate Specification Section

i. Drawing number and detail references, as appropriate

4. Each submittal must be stamped by the Contractor indicating that the submittal was reviewed for conformance with the Contract Documents.

5. The Engineer will not accept nor review submittals that have not been signed and stamped by the Contractor.

6. The Engineer will not accept nor review submittals from suppliers or Subcontractors.

D. The Contractor shall package each submittal appropriately for transmittal and handling.

1. Transmit each submittal from the Contractor to the Engineer.

2. The Engineer will not accept submittals received from sources other than the Contractor and will return same to the sender.

3. On the transmittal, record relevant information and requests for Engineer action.

4. On the form, or separate sheet, record deviations from Contract Document requirements, including variations, limitations, and justification.

5. Include Contractor's certification that information complies with Contract Document requirement.

01.1.07 SHOP DRAWINGS

Shop drawings shall be submitted in accordance with the General Conditions and the following:

A. The Contractor shall submit four (4) copies of shop drawings and/or manufacturer's literature as specified herein prior to commencing the fabrication, manufacture, or installation of items to be incorporated in the work.

1. Shop drawings shall present all diagrams, illustrations, performance data, manufacturer's literature, setting diagrams, patterns, templates, schedules, and similar drawings and any other data necessary to demonstrate conformance with these Specifications.

2. Certifications where required by these Specifications shall be included with shop drawing submittals.

B. The Contractor shall review each shop drawing before submitting it to the Engineer to determine that it is acceptable in terms of means, methods, techniques, sequences, and operation of construction, safety precautions and programs incidental thereto, all of which are the Contractor's responsibility.

1. The Contractor shall call to the Engineer's attention any shop drawing or detail thereon which varies from what the Specifications have called for.

2. Shop drawings that are submitted by the Contractor, but not required by the Specifications, shall be returned to the Contractor, and shall not be reviewed.

C. Shop drawings which are reviewed by the Engineer shall be stamped with the Engineer's review action stamp prior to being returned to the Contractor.

1. The Engineer's review shall consist of checking only for conformance with the design concept of the project and compliance with the information given in the Contract Documents.

2. The Contractor is responsible for dimensions to be confirmed and correlated at the job site for information that pertains solely to the fabrication processes of the techniques of construction and for coordination of the work of all trades.

D. The Contractor shall not use shop drawings without an appropriate final stamp indicating action taken.

E. **Technical Provisions**

1. Reserved.

2. Items requiring shop drawing submittal are listed in **SCHEDULE 01 33 00 A** at the end of this Section.

01.1.08 PRODUCT DATA

A. The Contractor shall collect product data into a single submittal for each element of construction or system.

B. Product data includes printed information, such as manufacturer's installation instructions, catalog cuts, standard color charts, roughing-in diagrams and templates, standard wiring diagrams, and performance curves.

C. The Contractor shall mark each copy to show actual product to be provided.

1. Where printed Product Data includes information on several products that are not required, mark copies to indicate the applicable information.

2. Include the following information:

a. Manufacturer's printed recommendations.

b. Compliance with trade association standards.

c. Compliance with recognized testing agency standards.

d. Application of testing agency labels and seals.

e. Notation of dimensions verified by field measurement.

f. Notation of coordination requirements.

D. The Contractor shall not submit Product Data until they have confirmed compliance with all requirements of the Contract Documents.

E. The Contractor shall submit four (4) copies of each required submittal, unless otherwise requested.

1. The Engineer will retain two copies, forward one copy to the Owner, and will return one to the Contractor marked with action taken and corrections or modifications required.

2. Unless noncompliance with Contract Document provisions is observed, the submittal may serve as the reviewed submittal.

F. The Contractor shall furnish copies of reviewed submittals to installers, subcontractors, suppliers, manufactures, fabricators, and others as required for performance of construction activities.

1. Show distribution on transmittal forms. Maintain one copy at the project site for reference.

2. Do not proceed with installation until a copy of Product Data is in the Installer's possession.

3. Do not permit use of unmarked copies of Product Data in connection with construction.

G. **Technical Provisions**

1. Reserved.

2. Items requiring product data submittal are listed in **SCHEDULE 01 33 00 A** at the end of this Section.

01.1.09 SAMPLES

A. The Contractor shall submit full-size, fully fabricated samples cured and finished as specified and physically identical with the material or product proposed.

B. Samples include partial sections of manufactured or fabricated components, cuts or containers of materials, color range sets, and swatches showing color, texture, and pattern.

C. The Contractor shall mount or display samples in the manner to facilitate review of qualities indicated.

1. Include the following:

a. Specification section number and reference.

b. Generic description of the sample.

c. Sample source.

d. Product name or name of the manufacturer.

e. Compliance with recognized standards.

f. Availability and deliver time.

2. Submit samples for review of size, kind, color, pattern, and texture.

a. Where variation in color, pattern, texture, or other characteristic is inherent in the material or product represented, submit at least three multiple units that show approximate limits of the variations.

b. Refer to other specification sections for requirements for samples that illustrate workmanship, fabrication techniques, details of assembly, connections, operation, and similar construction characteristics.

c. Refer to other sections for samples to be returned to the Contractor for incorporation in the special requests regarding disposition of sample submittals.

d. Samples not incorporated into the work, or otherwise designated as the Owner's property, are the property of the Contractor and shall be removed from the site prior to Substantial Completion.

D. Except for samples illustrating assembly details, workmanship, fabrication techniques, connections, operation, and similar characteristics, the Contractor shall submit three samples for review.

1. The Engineer will return one sample marked with the action taken.

E. The Contractor shall prepare and distribute additional samples to Subcontractors, manufacturers, fabricators, suppliers, installers, and others as required for performance of the work.

1. Show distribution on transmittal forms.

2. Maintain reviewed samples at the project site for quality comparisons throughout the course of construction.

F. The Contractor shall comply with submittal requirements to the fullest extent possible and process transmittal forms to provide a record of activity.

G. **Technical Provisions**

1. Reserved.

2. Items requiring sample submittal are listed in **SCHEDULE 01 33 00 – A** at the end of this Section.

01.1.10 QUALITY CONTROL SUBMITTALS

A. The Contractor shall submit quality-control data, including design data, certifications, manufacturer's instructions, manufacturer's field reports, and other quality-control submittals as required under other sections of the specifications.

B. Certifications: Where other sections of the specifications require certification that a product, material, or installation complies with specified requirements, the Contractor shall submit a notarized certification from the manufacturer certifying compliance with specified requirements.

1. Signature: Certification shall be signed by an officer of the manufacturer or other individual authorized to sign documents on behalf of the company.

C. Inspection and Test Reports: The Contractor shall submit, as required by other sections of the specifications, inspection and test records.

D. **Technical Provisions**

1. Reserved.

2. Items requiring quality control submittals are listed in **SCHEDULE 01 33 00 – A** at the end of this Section.

01.1.11 MIX DESIGNS

Mix designs shall be submitted in accordance with the General Conditions and the following:

A. When specified in individual Specification Sections, the Contractor shall submit four (4) copies of the manufacturer's product mix design to the Engineer for review.

1. Mix designs shall include either a mix report by a certified testing laboratory or the specified number of laboratory test results.

B. The Contractor shall review each mix design before submitting it to the Engineer to determine that it meets the requirements of these Specifications.

1. The Contractor shall call to the Engineer's attention any mix design, which varies from what the Specifications have called for.

2. Mix designs that are submitted by the Contractor, but not required by the Specifications, shall be returned to the Contractor, and shall not be reviewed.

C. Mix designs, which are reviewed by the Engineer, shall be stamped with the Engineer's review action stamp prior to being returned to the Contractor.

1. The Engineer's review shall consist of checking only for conformance with the design concept of the project and compliance with the information given in the Contract Documents.

2. The Contractor is responsible for the application or installation of the subject materials in conformance with the Specifications.

D. The Contractor shall not use any material requiring the review of a mix design without an appropriate final stamp indicating action taken.

E. **Technical Provisions**

1. Reserved.

2. Items requiring mix design submittal are listed in **SCHEDULE 01 33 00 – A** at the end of this Section.

01.1.12 ENGINEER'S REVIEW AND RESPONSIBILITIES

A. Except for submittals for the record of information, where action and return is required, the Engineer will review each submittal, mark to indicate action taken, and return promptly.

B. Submittals received shall be categorized under the following definitions for review:

1. "Pre-approved" – predefined in the Contract Documents as an item for review

2. "Or Equals" – defined under **ARTICLE 7** of **SECTION 00 72 00 GENERAL CONDITIONS**

3. "Substitutes" – defined under **ARTICLE 7** of **SECTION 00 72 00 GENERAL CONDITIONS**

C. The Engineer will stamp each submittal with a uniform action stamp.

D. The Engineer will mark the stamp appropriately to indicate the action taken, as follows:

1. "No Exceptions Taken" The work covered by the submittal may proceed provided it complies with requirements of the Contract Documents.

2. "Make Corrections Noted" The work covered by the submittal may proceed provided it complies with notations and corrections on the submittal and requirements of the Contract Documents.

3. "Revise and Resubmit" Do not proceed with work covered by the submittal. Revise and resubmit without delay. Do not use, or allow others to use, submittals marked "Revise and Resubmit" at the Project Site or elsewhere where work is in progress.

4. "Not Acc.(eptable)" Do not proceed with work covered by the submittal. Resubmit without delay. Do not use, or allow others to use, submittals marked "Not Acc." at the Project Site or elsewhere the work is in progress.

E. The Engineer will return unsolicited submittals to the sender without action.

F. **Technical Provisions**

1. Reserved.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

SCHEDULE 01 33 00 – A

ITEMS REQUIRING SHOP DRAWING, PRODUCT DATA, SAMPLE OR QUALITY ASSURANCE SUBMITTALS

Division or Section	Description
33	Pipe Bedding
3	Concrete
3	Rebar
33	Castings
33	Pipe

A. This schedule is provided for convenience and should not be considered comprehensive or all inclusive. The Shop Drawings and other applicable product data are required per individual sections of these Specifications.

END OF SECTION

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PART 1 GENERAL

01.1.01 DESCRIPTION

A. This section of the Project Manual describes the Contractor responsibilities for health, safety, and emergency response. This description is not intended to be comprehensive.

01.1.02 ON-SITE HEALTH AND SAFETY REQUIREMENTS

A. General

1. The Contractor is responsible for implementation and enforcement of safe Work practices including, but not limited to, trenching, materials handling, operation of equipment, and safety of the public during progress of the Work.

2. The right of the Owner and Engineer to observe or otherwise review the Work and operations does not relieve the Contractor from any of the Contractor's obligations as stated in the General Conditions.

3. The Contractor shall incorporate all safety requirements into the Contractor's progress and work schedules including preconstruction meetings, safety meetings, and posted safety rules.

4. Payment

a. Included in Bid: Cost for Work performed in OSHA Level of protection deemed necessary by the Contractor and any protection required due to means, methods and materials utilized by the Contractor.

b. Work specified in this section shall be included as part of the cost for the work for which protection is required.

B. Quality Assurance

1. Regulatory Requirements

a. The Contractor shall plan for and ensure personnel comply with basic provisions of OSHA Safety and Health Standards (29 CFR 1910) and General Construction Standards (29 CFR 1926) as appropriate.

b. The Contractor shall comply with applicable laws and regulations of any public body having jurisdiction for safety of persons or property.

C. Operations and Equipment Safety

1. The Contractor is responsible for initiating, maintaining, and supervision of safety precautions and programs in connection with the Work.

a. The Contractor shall take necessary precautions for safety of employees on Project site and other persons and organizations who may be affected by the Project.

2. The Contractor's duties and responsibilities for safety in connection with the Work shall continue until such time as the Work is complete and the Owner has issued notice to the Contractor that the Work is complete.

D. Health & Safety

1. The Contractor is responsible for implementation and enforcement of health and safety requirements and shall take necessary precautions and provide protection for the following:

a. Personnel working on or visiting the Project site, irrespective of employer.

b. Work and materials or equipment to be incorporated in the Work area on or offsite.

c. Other property at or adjacent to the Project site.

d. Public exposed to job related operations or potential release of toxic or hazardous materials.

2. The Contractor is responsible for maintaining a visitor's log.

a. All Contractor's visitors must sign in and out indicating their name(s), the date and time.

E. Submittals

1. The Contractor shall submit four (4) copies of a Health and Safety Plan (HASP) to the Owner within (3) days after Notice to Proceed. The Work on-site shall not proceed until HASP has been submitted to the Owner.

a. Submittal of the Contractor's HASP to the Owner is to inform the Engineer and the Owner so they can comply with HASP during the performance of their on- site responsibilities as described in the Contract Documents.

b. Submittal of the Contractor's HASP shall neither impose on the Owner responsibility for adequacy of HASP nor release the Contractor from full responsibility therefor.

F. Technical Provisions

1. Reserved.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION

PART 1 GENERAL

01.1.01 DESCRIPTION

A. This section of the Project Manual describes the procedures for environmental protection of the site.

B. The Contractor shall provide protection, operate temporary facilities, and conduct construction in ways and by methods that comply with environmental regulations and that minimize possible air, waterway, and subsoil contamination or pollution or other undesirable effects.

01.1.02 PROTECTION OF AIR QUALITY

A. The Contractor shall minimize air pollution by requiring use of properly operating combustion emission control devices on construction vehicles and equipment and encourage shutdown of motorized equipment not in use.

B. The Contractor shall not burn trash on construction site.

C. If temporary heating devices are necessary for protection of work, they shall not cause air pollution.

01.1.03 NOISE CONTROL

A. The Contractor shall conduct operations to cause the least annoyance to neighbors in the vicinity of work and comply with applicable local ordinances.

B. The Contractor shall equip compressors, hoists, and other apparatus with mechanical devices necessary to minimize noise. The Contractor shall equip compressors with silencers on intake lines.

C. The Contractor shall equip gasoline or oil operated equipment with silencers or mufflers on intake and exhaust lines.

01.1.04 DUST CONTROL

A. The Contractor shall maintain temporary site roadways, the Owner's existing roads, and public roads used during construction operations in clean, dust free condition.

B. The Contractor shall comply with local environmental regulations for dust control and directions of the Owner. If the Contractor's dust control measures are considered inadequate by the Owner, the Owner will require the Contractor to take additional dust control measures.

C. Providing Dust Control shall be included in the price bid for the work that requires dust control, and no additional compensation will be made therefor.

01.1.05 FUELS AND LUBRICANTS

A. The Contractor is to comply with all local, state, and federal regulations concerning transportation and storage of fuels and lubricants.

B. Fuel storage area and equipment shall be approved by the Owner prior to installation. Containment requirements shall be submitted by the Contractor for approval in writing by the Owner.

C. All spills or leakage shall be reported to the Owner and cleanup by the Contractor shall be commenced immediately upon discovery of the spill.

D. The Owner shall reserve the right to order damaged or leaking equipment off site.

01.1.06 CONTAMINATED SOILS

A. If the Contractor encounters hydrocarbon-contaminated soils during work operations, the Contractor is required to immediately stop all work activity in the contaminated area.

B. Technical Provisions

1. The Contractor shall be responsible for contacting the North Dakota Department of Environmental Quality, Division of Waste Management at **1-701-328-5166** for further guidance. **(ND)**

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION

PART 1 GENERAL

01.1.01 DESCRIPTION

A. This section of the Project Manual defines the obligations of the Contractor's Quality Control requirements and the Owner's Quality Assurance obligations. The program provides a method to monitor quality of the Work including but not limited to suppliers, manufacturers, products, services, site conditions, and workmanship.

01.1.02 DEFINITIONS

A. Quality Control – Shall be defined as planned and specific actions or operations necessary to produce a product that complies with the Contract Documents. Quality Control consists of action, inspections, sampling and testing necessary to ensure the Work is in compliance with the Contract Documents and to control production and construction processes. Quality Control is keyed to the construction sequence to quickly determine when the Work is out of compliance with the Contract Documents and to respond to correct the situation and bring the Work into compliance. Quality Control is the responsibility of the Contractor.

B. Quality Assurance – Planned and systematic observations of the Work. The Owner or Engineer will provide Quality Assurance.

C. Verification/Compliance Testing – Sampling and testing which is carried out independent of the Contractor's Quality Control testing to confirm or verify that the Work complies with the Contract Documents. The frequency of compliance or verification testing shall be determined by the Owner and may not be adequate for Contractor's production and placement needs. Verifications and compliance testing will not be used to determine construction procedures or operations. Verifications/Compliance testing will be provided by the Owner.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

01.3.01 QUALITY CONTROL OF INSTALLATION

A. Contractor shall submit a Quality Control Plan defining a program and the documentation proposed to ensure that all materials and work conform to the Contract Documents. The plan shall identify personnel, procedures, controls, tests, frequency of tests and records, and forms to be used. The Owner reserves the right to reject personnel to perform Quality Control for lack of experience.

B. The Contractor shall submit all records of all tests to the Engineer within twenty-four (24) hours of the testing. The Quality Control laboratory shall notify the Contractor and the Engineer should irregularities or deficiencies be observed in the Work during the testing. If quality control tests are not submitted to the Engineer in the given period of time defined in this paragraph, the Engineer shall deem the tests as "Failed" and acceptance for that portion of Work will not be recommended.

C. Inspections, tests or approvals by the Engineer or others shall not relieve the Contractor from his obligations to perform the Work in accordance with the requirements of the Contract Documents.

D. The Contractor shall inspect all materials delivered to the site to determine their suitability to be incorporated into the work and conformance with the Drawings and Specifications.

E. The Contractor shall inspect the installation of all materials to determine conformance with the Drawings and Specifications.

F. The Contractor shall have the job superintendent on-site at all times work is being performed by work forces of the Contractor or Subcontractors.

G. The Contractor shall comply fully with manufacturers' instructions, including each step in sequence. Should manufacturers' instructions conflict with Contract Documents, request clarification from Engineer before proceeding.

H. The Contractor shall comply with specified standards as a minimum quality for the Work except when more stringent tolerances, codes, or specified requirements indicate higher standards or more precise workmanship.

I. The Contractor shall perform work by persons qualified to produce workmanship of specified quality.

J. The Contractor shall secure products in place with positive anchorage devices designed and sized to withstand stresses, vibration, physical distortion, or disfigurement.

01.3.02 SOURCE OF MATERIALS AND QUALITY

A. All materials incorporated in the work are subject to verification from the manufacturing plant that the materials comply in all respects with the requirements of these Specification.

B. Verification may be in the form of a certificate of compliance, lab analysis, or both. These certifications shall clearly identify the material being certified and shall be signed by a person having legal authority to bind the suppliers or manufacturer.

C. The Contractor shall be responsible for any testing necessary to analyze the materials for certification.

01.3.03 TESTING LABORATORY SERVICES

A. The Contractor shall secure the services of an independent, Owner-approved testing laboratory to provide for materials testing as required in these Specifications for the purpose of quality control and payment.

B. The Contractor's Quality Control testing provider shall notify the Owner's Representative and Contractor promptly of irregularities and deficiencies observed in the work during performance of their services.

C. The Contractor's Quality Control testing provider shall submit timely certified reports of each test, inspection, and similar quality control service to the Owner's Representative with a copy to the Contractor.

D. The Contractor shall provide sufficient materials for testing purposes as required, the cost of which shall be included in the price bid for the work being tested.

E. Inspection or testing performed exclusively for the Contractor's convenience or quality control shall be the responsibility of the Contractor. Such testing shall not be eligible for reimbursement regardless of whether or not a pay item for Laboratory Testing Services is provided in the Bidder's Proposal.

F. Qualifications of Laboratory Personnel: Laboratory personnel involved in field and laboratory testing shall be certified to conduct the tests specified herein by the American Concrete Institute or the State Department of Transportation. The Lab shall be accredited by the AASHTO Materials Reference Laboratory (AMRL) or similar.

01.3.04 CONTRACTOR COOPERATION WITH QUALITY ASSURANCE

A. The Contractor shall assure the Owner's personnel and quality assurance personnel have access to all work area at all times work is in progress. The Contractor shall provide any special facilities or equipment to access work areas at Contractor expense.

B. The Owner's representative must have access to ready mix production facilities, asphalt batch plants, or any other associated production facility for sampling constituent materials during production to assure the materials meet these Specifications and represent those stated on the approved mix design.

C. Notification to the Engineer shall be given twenty-four (24) hours prior to when work is ready for observation or quality assurance testing. The Contractor shall routinely update the construction schedule to provide the Engineer with estimated sampling, testing, and verification dates and times.

D. Sampling of materials shall be split between the Contractor and Engineer and from the same source. The Engineer shall be notified 24 hours prior to any sampling and shall be present to collect samples. Contractor provided results of a sample without a split will not be approved and deemed unacceptable.

E. Quality Assurance retesting due to failing tests shall be performed by the Owner's Quality Assurance laboratory or agency. Costs associated with the re-test shall be deducted from the Contractor progress payment.

01.3.05 PAYMENT FOR TESTING

A. The Contractor shall be responsible for all Quality Control testing identified in the Contract Documents. These tests include but are not limited to mix design for concrete, flowable fill, asphalt, all initial aggregate quality tests, field density testing, field gradations, field concrete testing, welding tests, foundations tests, and tolerance tests.

B. The costs for preparing mix designs and job mix formulas will not be eligible for reimbursement regardless whether or not a pay item for Laboratory Testing Services is provided in the Bidder's Proposal.

C. Inspections and tests required by codes or ordinances, or by a plan approval authority, and made by a legally constituted authority, will be the responsibility of and will be paid for by the Contractor, unless otherwise provided in the contract Documents.

D. The Owner shall be responsible for all Quality Assurance testing costs except as noted in Sub-Section 01.3.03.D.

E. All testing and retesting will be done in accordance with the General Conditions, Article 14.

01.3.06 TEST FREQUENCY

A. The minimum frequency which will be used by the Contractor or his representative to determine Quality Control is listed below:

Material	Test	Frequency
Trench Embankment	Density/Moisture Content	One (1) test per 2 Vertical Feet for every 300 LF of Trench or one (1) test every excavation pit within traveled roadways or one (1) test every 4 excavation pits outside traveled roadways
Embankment	Density/Moisture Content	One (1) Test per 200 CY
Subgrade	Density/Moisture Content	One (1) Test per 200 SY for contiguous areas greater than 200 SY or One (1) Test for every 2 (Two) non-contiguous areas less than 200 SY **(WILL_OFF)**
Aggregate Base Coarse	Density/Moisture Content	One (1) Test per 200 SY for contiguous areas greater than 200 SY or One (1) Test for every 2 (Two) non-contiguous areas less than 200 SY **(WILL_OFF)**
Aggregate Surfacing	Density/Moisture Content	One (1) Test per 200 SY
Concrete	Slump, Air, Temp., Comp. Strength	One (1) Set per 100 CY, Min. five (5) Sets or Min. One (1) Set per Batch
Asphalt Pavement	Density	One (1) Test per 300 SY for contiguous areas greater than 300 SY or One (1) Test for every 2 (Two) non-contiguous areas less than 300 SY **(WILL_OFF)**

B. This is a minimum requirement. The Contractor is solely responsible to perform adequate testing to assure the work is in compliance with the Plans and Specifications.

END OF SECTION

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PART 1 GENERAL

01.1.01 WORK INCLUDED

A. From time to time during progress of the Work, the OWNER may require that testing be performed to determine that materials provided for the Work meet the specified requirements; such testing includes, but is not necessarily limited to:

1. In place moisture and density soil testing
2. Aggregate Testing;
3. Permeability Testing;
4. Concrete Testing
5. Geomembrane destructive testing

01.1.02 RELATED WORK DESCRIBED ELSEWHERE

A. Requirements for testing may be described in various sections of the Project Manual;

B. Where no testing requirements are described but the OWNER decides that testing is required. The OWNER may require testing to be performed under current pertinent standards for testing.

01.1.03 WORK NOT INCLUDED

A. Selection of testing laboratory. The ENGINEER will select a pre-qualified independent testing laboratory.

B. Payment for initial testing services. The OWNER will not pay for job mix formulas, mix designs, nor preliminary aggregate test specified else where.

C. Concrete Testing. Concrete testing described elsewhere shall be incidental to those bid items it is incorporated into.

01.1.04 QUALITY ASSURANCE

A. Qualifications of testing laboratory. The testing laboratory will be qualified to the OWNER'S approval in accordance with applicable ASTM Standards.

B. Codes and Standards. Testing, when required, will be in accordance with all pertinent codes and regulations and with selected standards of the American Society for Testing and Materials.

01.1.05 PRODUCT HANDLING

A. Promptly process and distribute all required copies of test reports and related instructions to ensure all necessary retesting and/or replacement of materials with the least possible delay in progress of the Work.

01.1.06 COOPERATION WITH TESTING LABORATORY

A. Representatives of the testing laboratory shall have access to the Work at all times

B. Provide facilities for access in order that the laboratory may properly perform its functions.

01.1.07 SCHEDULES FOR TESTING

A. Establishing schedule

1. By advance discussion with the testing laboratory selected, determine the time required for the laboratory to perform its tests and to issue each of its findings.
2. Provide all required time within the construction schedule.

B. Revising schedule

When changes of construction schedule are necessary during construction, coordinate all such changes of schedule with the testing laboratory as required.

C. Adherence to schedule

When the testing laboratory is ready to test according to the determined schedule but is prevented from testing or taking specimens due to incompleteness of the Work.

1. All extra costs for testing attributable to the delay may be back-charged to the Contractor and
2. No costs shall not be borne by the OWNER.

01.1.08 TAKING SPECIMENS

A. All specimens and samples for testing, unless otherwise provided in these Contract Documents, will be taken by the testing laboratory

B. All sampling equipment and personnel will be provided by the testing laboratory

C. All deliveries of specimens and samples to the testing laboratory will be performed by the testing laboratory or Engineer.

01.1.09 PAYMENT FOR TESTING SERVICES

A. Initial services

1. The OWNER will pay for all initial testing services requested by the ENGINEER except where otherwise specified.
2. Testing that will be paid for by the OWNER under the Contract are, but not limited to:
   a. Concrete testing – air content, slump, weight, temperature, and cylinder casting for strength tests.
   b. Laboratory testing for Attenburgs, Proctors, density and moisturing and field moisture density testing of soil and aggregates.
   c. Gradations for aggregate and Clay Liner
   d. Permeability testing on the Clay Liner
   e. Field and laboratory seam testing for geomembrane.
3. When initial tests indicate non-compliance with the Contract Documents, the costs of initial tests associated with that non-compliance shall be paid for by the Contractor and will not be reimbursed to the Contractor by the OWNER.

B. Retesting

1. When initial tests indicate non-compliance with the Contract Documents, all subsequent retesting occasioned by the non-compliance, shall be performed by the same testing laboratory and the costs thereof will not be reimbursed to the Contractor.

C. Code Compliance Testing

1. Inspections and tests required by codes or ordinances, or by a plan approval authority, and made by a legally constituted authority, shall be the responsibility of and shall be paid for by the Contractor, unless otherwise provided in the Contract Documents.

D. Contractor's Convenience Testing

1. Inspection or testing performed exclusively for the Contractor's convenience shall be the sole responsibility of the Contractor.

PART 2 PRODUCTS (NOT USED)

PART 3 CONSTRUCTION REQUIREMENTS (NOT USED)

END OF SECTION

PART 1 GENERAL

01.1.01 DESCRIPTION

A. The Contractor shall provide temporary services addressed in this section and:

1. Include costs for temporary services in the total price of contract.
2. Maintain temporary services until final completion of Project and final acceptance by the Owner.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

01.3.01 TEMPORARY UTILITY SERVICES

A. Temporary Services

1. The Contractor shall be responsible for coordinating the installation of temporary utilities as required for the construction.
2. The costs of installing, maintaining, and utilizing temporary utilities shall be included in the price bid for other portions of the Work and no additional compensation will be made therefor.
3. Temporary utilities shall remain in service and use until such time the Project is substantially completed and ready for use and occupancy by the Owner.
4. The Contractor shall not utilize utilities which are to be paid for by the Owner for heating or construction without the expressed written consent of the Owner.
5. Failure on the part of the Owner to provide said consent shall not relieve the Contractor of the responsibility to protect the work or any part of the facility from damage due to freezing or other causes.
6. The cost of utilities and fuel use and maintenance necessary for start-up and testing of equipment shall be included in the price bid for the equipment and no additional compensation shall be made therefor.

01.3.02 TEMPORARY ELECTRICAL SERVICE

A. When a field office is required, the Contractor shall provide a temporary, weatherproof, grounded electric service and distribution system of size and capacity needed for the mobile field office.

B. The Contractor shall be responsible for the costs of consumed power furnished through temporary or permanent service until final acceptance of Project by the Owner.

01.3.03 TEMPORARY HEAT

A. The Contractor shall provide temporary heat required by construction activities for:

1. Curing or drying of completed installations.
2. Protection of installed construction from adverse effects of low temperatures or high humidity.
3. Maintain a minimum temperature of 60°F in permanently enclosed portions of the building and areas where finished work has been installed.

B. The Contractor shall select safe equipment that will not have harmful effects on completed installations or elements being installed.

C. The Contractor shall coordinate ventilation requirements to produce ambient conditions required.

D. Except where use of the permanent system is authorized, the Contractor shall provide vented, self-contained liquid propane gas or fuel oil heaters with individual space thermostatic control.

1. Use of gasoline-burning space heaters, open flame or salamander type heating units is prohibited.

E. When the permanent heating system is tested and ready for operation, it may be used on a temporary basis for heating and building until final acceptance only if approved in writing by the Owner:

1. The Contractor shall be responsible for cost of operation and fuel.

2. The Owner will assume responsibility for operation and fuel costs on the date of final acceptance of the contract.

01.3.04 TEMPORARY WATER SERVICE

A. The Contractor shall provide temporary potable water service for construction operations, including drinking water, water necessary for leak testing and disinfection of new construction, and sanitization.

B. The Contractor shall be responsible for costs associated with construction water usage regardless of source.

C. Temporary Water Service to customers, when required, must be provided in conformance with the provisions of **SECTION 01 51 36 – TEMPORARY WATER** of these Specifications.

01.3.05 SANITARY FACILITIES

A. The Contractor shall provide self-contained, single occupant toilet units of the chemical, aerated recirculation, or combustion type, properly vented, and fully enclosed with a fiberglass reinforced polyester shell or similar nonabsorbent material.

END OF SECTION

PART 1 GENERAL

01.1.01 DESCRIPTION

A. This section of the Project Manual includes work related to the furnishing, installing, and maintaining of traffic control devices as it relates to the completion of the Work.

B. The Contractor shall be responsible for detour signing in the Work Zone.

C. The Contractor shall be responsible for any fencing or control for the limits of construction area.

01.1.02 SUBMITTALS

A. The Contractor shall prepare a Construction Traffic Control Plan and submit the plan to the Owner's Representative for approval in accordance with **SECTION 01 33 00 – SUBMITTAL PROCEDURES** of these Specifications.

B. **Technical Provisions**

1. Reserved.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

01.3.01 GENERAL

A. The Contractor shall be responsible for traffic control on the Project, and shall furnish, erect, and maintain all necessary traffic control devices required to provide safe movement of vehicular traffic through the Project, in accordance with the Drawings and these Specifications.

B. The Contractor shall also be responsible for protection of pedestrian traffic during construction.

C. Whenever it is necessary to cross, obstruct, or close roads, driveways, and walks, whether public or private, the Contractor shall obtain approval from the governing party and shall, at Contractor's expense, provide and maintain suitable and safe bridges, detours, and other temporary expedients for the accommodation of public travel. The provisions for temporary expedients will not be required when the Contractor has obtained permission from the owner and tenant of private property, or from the authority having jurisdiction over public property, to obstruct traffic at the designated point.

D. Prior to the start of any construction operations that necessitate traffic control signing that is the Contractor's or Subcontractor's responsibility, the Contractor shall make available for inspection (24 hours prior to installation) all traffic control devices to be furnished and used by the Contractor in order to insure conformance with the Manual on Uniform Traffic Control Devices for Streets and Highways (MUTCD). The Contractor shall have full responsibility for meeting the requirements of the MUTCD.

E. The Contractor shall modify the proposed traffic control devices as deemed necessary by the Owner's Representative.

F. Traffic control devices include, but are not limited to barricades, warning signs, lane marking, trailers, flashers, cones, and drums as required. Devices must have sufficient barricade weights to maintain barricade stability.

G. No hand-lettered signs will be approved for installation.

01.3.02 NOTIFICATIONS

A. The Owner will be notified of ALL alley, street/intersection, and complete direction of travel closures and openings.

B. The School District's Transportation Department (during school times) will be notified of ALL street/intersection and complete direction of travel closures and openings.

C. The County Highway Department will be notified of ALL County street/intersection and complete direction of travel closures and openings.

D. The Township will be notified of ALL Township street/intersection and complete direction of travel closures and openings.

E. The Department of Transportation will be notified of ALL State highway/intersection and complete direction of travel closures and openings.

F. Sanitation Department or others, as appropriate, will be notified of all alley closures.

G. News releases/handouts and personal contact requirements will be determined by the Owner.

01.3.03 DAILY INSPECTIONS

A. The Contractor shall provide surveillance at least once every 24 hours of the traffic control devices to ensure that they are properly placed and in good condition.

B. The Contractor shall immediately repair or replace any traffic control device that is damaged, moved, stolen, or destroyed.

C. Traffic control devices shall be maintained in such a manner that the cleanliness, reflectorization and position is acceptable to the Owner's Representative.

D. The Contractor shall submit to the Owner's Representative a checklist certifying that the daily inspection of the traffic control devices has been taken.

E. The checklist shall be in a form approved by the Owner's Representative.

01.3.04 CONTACT PERSONS

A. The names, addresses, and telephone numbers (not long distance) of at least two local individuals who will be available during non-working hours to maintain or replace traffic control devices shall be furnished to the Owner's Representative. These individuals shall have some knowledge of the maintenance and the proper placement of traffic control signs and devices.

01.3.05 FAILURE TO MAINTAIN

A. If at any time, the Contractor fails to adequately maintain any of the traffic control devices, the Owner may proceed to perform the maintenance and deduct the cost thereof from any monies due or coming due the Contractor. The Contractor shall be solely liable for any damages caused by a failure to maintain the traffic control devices.

01.3.06 SIGNAGE

A. Sign supports, barricades, and other devices placed in or near the roadway shall be crash worthy and meet the applicable requirements of the AASHTO Roadside Design Guide (latest edition).

B. Only sandbags resting on the ground should be used if ballast is required to keep signs or barricades upright.

01.3.07 ACCESS MAINTENANCE

A. The Contractor shall maintain access to all abutting properties, especially for emergency vehicles, and minimize inconvenience to abutting property owners.

B. Providing access maintenance shall be included in the price bid for work affecting access and no additional compensation will be made therefor.

01.3.08 PROTECTION OF PEDESTRIANS

A. The Contractor shall be responsible for the protection of pedestrian and bicycle traffic on sidewalks and bike paths and at intersections by providing a temporary gravel surface after the sidewalk designated for removal has been removed.

B. Providing protection for pedestrians as specified herein shall be included in the price bid for the work that requires the protection of pedestrians, and no additional compensation will be made therefor.

END OF SECTION

PART 1 GENERAL

01.1.01 DESCRIPTION

A. This section of the Project Manual includes the Contractor's coordination of the work with Subcontractors, the Owner, and affected property and utility owners.

01.1.02 NOTICE TO UTILITIES

A. The Contractor shall notify public and private utility companies and municipalities as to any of their properties (such as pole lines, conduits, gas pipes, water pipes, sewers, and tile lines) located within the project site that must be removed or relocated to complete the Project.

B. The notice will specify the locations to which their properties are to be relocated.

C. No warranty is made or implied by the Owner that the utility owners will remove or relocate their properties prior to commencement of construction operations or in sufficient time or manner to prevent interference with the Contractor's operations.

D. The Contractor shall give notice to the owners of all known utilities at least 48 hours (excluding Saturdays, Sundays, and Holidays) before starting any operations affecting those properties.

E. If, during the course of their operations, the Contractor discovers utility property whose existence was not known, the Contractor shall immediately notify the utility company and the Owner's Representative.

F. **Technical Provisions**

1. North Dakota One-Call: 811 or (800) 795-0555. **(ND)**

2. Utilities known to exist in the project area **(Jamestown ND)** are:

UTILITY	OWNER	TELEPHONE
Water/Sewer/Storm Sewer	City of Jamestown	701-252-5900
Communication / Cable TV	CSI	701-252-2225
	Midland Communications	800-888-1300
	Dakota Communications	701-952-1000
Natural Gas	MDU	800-638-3278
Electrical	Otter Tail Power	800-257-4044

3. This list is not meant to be inclusive and other utilities may exist within the project area. The Contractor shall be cautioned that all utilities may not be subject to the One-Call system and should take necessary precautions.

01.1.03 EXISTING UTILITIES

A. Known utilities and facilities adjacent to or within the work area are shown on the Drawings. The locations shown are taken from existing records and the best information available from existing utility plans; however, it is expected that there may be some discrepancies and omissions in the locations and the number and type of utilities shown. The Contractor's request for additional compensation or contract time resulting from encountering utilities not shown will be considered as set forth in the General Conditions. The Contractor is solely responsible for locating and avoiding conflicts with all existing utilities. The Contractor shall pay all costs associated with having utility company representatives on the site for this work and shall include these costs in the price bid for related items of work.

B. No attempt has been made to include information regarding service lines or private underground utilities beyond the responsibility of public utilities.

C. The Contractor shall locate and protect all underground utilities in or near the work whether they are private or public and regardless of whether or not they are shown on the Drawings.

D. Where the Contractor's operations could cause damage or inconvenience to telephone, television, power, oil, gas, water, sewer, or irrigation systems, the Contractor shall make arrangements

necessary for the protection of these utilities and services. The Contractor shall replace existing utilities removed or damaged during construction with equal or better material, unless otherwise provided for in these Contract Documents.

1. Coordination with utilities shall be performed in accordance with **SECTION 01 31 00 – PROJECT MANAGEMENT AND COORDINATION** of these Specifications.

E. Special attention shall be paid to crossings of fiber optics cables and where the carrier pipes have been capped with concrete. In some cases, the bottom portion of the piping is not supported by the concrete cap. The Contractor shall take special precautions in supporting and excavating under these crossings.

F. The Contractor shall notify utility offices that are affected by construction operations at least 48 hours in advance. Under no circumstances expose any utility without first obtaining permission from the appropriate agency. Once permission has been granted, locate, expose, and provide temporary support for the utilities.

G. The Contractor shall protect all utility poles from damage. If interfering utility poles will be encountered, notify the utility company at least 48 hours in advance of construction operations to permit necessary arrangements with the utility company for protection or relocation of the interfering poles. Relocation of utility poles not specified in the contract documents for the Contractor's convenience shall be at the Contractor's expense.

H. The Contractor shall be solely and directly responsible to the owner and operator of such properties for damage, injury, expense, loss, inconvenience, delay, suits, actions, or claims of any character brought because of injuries or damage which may result from construction operations under this Contract.

I. Neither the Owner nor its officers or agents shall be responsible to the Contractor for damages as a result of the Contractor's failure to protect utilities encountered in the work.

J. The Contractor shall maintain a legible log of all utility crossings showing type, depth, date of crossing, location referenced to project stationing, and a notation if the utility was damaged, type of repair, and who made the repair. The Contractor will work with the Engineer to maintain an accurate and complete log which will become part of the as-constructed Contract Drawings.

K. Immediate and adjacent areas where excavations are to be made shall be thoroughly checked by visual examination for indications of underground facilities and also checked with electronic metal and pipe detection equipment. Where there is reasonable cause to verify the presence or absence of any underground facility, the Contractor shall make exploratory excavations prior to proceeding with major construction in the area. Where information on buried facilities is required to verify their nature, shape, configuration, dimensions, materials, or other properties, make exploratory excavations as required to ensure avoidance of conflicts and as acceptable to the Owner and Engineer.

L. The Contractor is advised that there is a One-Call utilities locate number in use for utility location requests within the State of North Dakota for buried gas and electrical lines, buried telecommunication lines, and underground water, sewer, and storm drains. The One-Call number is 1-800-795-0555. It is mandatory to use this system before any excavation work in North Dakota.

M. The Contractor shall assume full responsibility for reimbursing the utility owners for any damages caused by their operations to utility properties whose existence and approximate locations were made known to them before the damage was done.

N. The Contractor shall be responsible for providing buried utility locations for areas on the site which are beyond the responsibility of utility owners.

O. The utility lines beyond the area of responsibility of the utility owners may include but are not necessarily limited to the following:

1. Site specific electrical distribution lines
2. Site specific control wiring
3. Site specific water, sewer, and process lines

4. Site specific natural gas lines

P. Nothing in these Specifications shall make the Contractor liable for damage to utility property located below the ground surface, in the absence of negligence, if the owner of the utility property, after reasonable notice from the Contractor, fails to advise the Contractor of its location and approximate depth below the ground surface.

01.1.04 INTERFERING STRUCTURES

A. The Contractor shall take necessary precautions to prevent damage to existing structures, whether on the surface, above ground, or underground. An attempt has been made to show major structures on the Drawings. While the information has been compiled from the best available sources, its completeness and accuracy cannot be guaranteed.

B. Existing features, fences, retaining walls, mailboxes, decorative pillars, yard décor, culverts, storm sewers, utility poles, rip rap, etc., that are in conflict or adjacent to the project site shall be protected. If they are disturbed, they will be replaced or repaired by the Contractor to equal or better conditions, and the cost shall be incidental to the item of work affecting the features unless specifically itemized in the bid form.

C. The Contractor may remove and replace in equal or better than original condition, small structures such as fences, mailboxes, and signposts that interfere with the Contractor's operations. Replacement of these small structures will be incidental to the work. The Contractor shall obtain permission from the small structure owner prior to removal and replacement. The Contractor shall comply with all regulatory requirements and the provisions of **SECTION 32 05 05 – SELECTIVE DEMOLITION FOR EXTERIOR IMPROVEMENTS** of these Specifications.

01.1.05 SITE CONDITIONS

A. Soil moisture and ground water levels will fluctuate due to seasonal changes, weather, irrigation, and other variations in conditions. Methods and procedures related to differing soils could include adjusting the means and methods of excavation, installation, or removal of soils encountered. The Contractor is responsible to determine construction methods and include these costs in the bid unit prices.

B. The Contractor will be responsible for determining if specialized equipment is necessary to perform the work in an efficient and effective manner according to the soil conditions. No additional compensation or leniency will be allotted based on soil conditions unless otherwise approved by the Owner or Engineer.

C. Groundwater may be present in the project area and may be encountered during construction. All Bidders are strongly encouraged to visit the site of the work and conduct all field investigations at their disposal to become acquainted with the nature of the work. Written authorization shall be obtained from the Owner, utilities, and others who may be directly affected prior to entering the property, conducting field tests, drilling, boring, excavating, or test pumping.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION

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PART 1 GENERAL

01.1.01 DESCRIPTION

A. This section of the Project Manual describes the requirements for final site cleaning.

01.1.02 FINAL CLEAN UP

A. The Contractor shall conduct cleaning and waste-removal operations to comply with local laws and ordinances and Federal and local environmental and anti-pollution regulations.

B. The Contractor shall employ experienced workers or professional cleaners for final clean up.

C. The Contractor shall complete the following cleanup operations before requesting review for certification of Final Completion:

1. Clean the Project site, and all areas disturbed by construction activities, including landscape development areas, of rubbish, waste material, litter, and other foreign substances.
2. Remove all construction debris and surplus materials from the site.
3. Restore turf areas in staging areas and all areas disturbed by the construction.
4. Remove all temporary traffic control devices.
5. Sweep paved areas broom clean.
6. Remove petrochemical spills, stains, and other foreign deposits.
7. Rake grounds that are neither planted nor paved to a smooth, even-textured surface.
8. Remove tools, construction equipment, machinery, and surplus material from the site.
9. Remove debris from limited access spaces, including equipment vaults, manholes, and similar spaces.

D. The Contractor shall comply with safety standards for cleaning.

1. Do not burn waste materials.
2. Do not bury debris or excess materials on Owner's property.
3. Do not discharge volatile, harmful, or dangerous materials into drainage systems.
4. Remove waste materials from Project site and dispose of lawfully.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION

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PART 1 GENERAL

01.1.01 DESCRIPTION

A. This section of the Project Manual includes the submittals and procedures which must be completed before Final Payment can be considered by the Owner.

01.1.02 RELATED WORK

A. The following items of related work are specified and included in other sections of this Project Manual:

SECTION 00 65 00 CLOSEOUT FORMS
SECTION 00 72 00 GENERAL CONDITIONS
SECTION 01 11 00 SUMMARY OF WORK
SECTION 01 29 00 PAYMENT PROCEDURES
SECTION 01 78 00 CLOSEOUT SUBMITTALS

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

01.3.01 GENERAL

A. **Technical Provisions**

1. Reserved.

01.3.02 SUBSTANTIAL COMPLETION

A. Before requesting a review for determining date of Substantial Completion, the Contractor shall complete the following:

1. Prepare a list of items to be completed and corrected (punch list), the value of items on the list, and reasons why the Work is not complete.
2. Complete final clean up requirements.
3. Touch up and otherwise repair and restore damaged portions of the work to eliminate visual defects.
4. The Contractor shall furnish the Owner written releases from property owners and/or public/private agencies where staging activities, or work within easements has been undertaken.
5. In the event the Contractor is unable to secure written releases, the Contractor shall inform the Owner for reasons.
6. The Owner or its representatives will examine the site, and the Owner will direct the Contractor to complete work that are necessary to satisfy terms of the contracts or easements.
7. Should the Contractor refuse to do this work, the Owner reserves the right to have it done by a separate contract and deduct the cost of same from the Contract amount, or require the Contractor to furnish a satisfactory bond in a sum to cover legal claims for damages.
8. When the Owner is satisfied that work has been completed in agreement with the Contract Documents and term of easements, the right is reserved to waive the requirement for written release if the Contractor's failure to obtain such statement is due to the grantor's refusal to sign, and this refusal is not based upon any legitimate claims that the Contractor has failed to fulfill the terms of the easement or if the Contractor is unable to contact or has had undue hardship in contacting the grantor.

B. The Contractor shall submit a written request for review for Substantial Completion.

1. Upon receipt of request, the Owner's Representative, the Owner, and the Contractor's Representative will agree upon a time to proceed with the review.

2. The Owner's Representative will prepare a deficiency list of items found to be incomplete or incorrect and will prepare the Certificate of Substantial Completion. The correction period for the work deemed to be substantially complete shall begin on the date identified on the completed certificate. Contract time will continue to run until the Certificate of Substantial Completion for all work has been issued.

3. The Contractor shall request a subsequent review when the Work identified in previous reviews as incomplete is completed or corrected.

4. Results of completed reviews will form the basis of requirements for Final Completion.

01.3.03 FINAL COMPLETION

A. Before requesting final review for determining date of Final Completion, the Contractor shall complete the following:

1. Submit a final application for payment according to **SECTION 01 29 00 – PAYMENT PROCEDURES.**

2. Submit a certified copy of the Owner's Representative's Substantial Completion review list of items to be completed or corrected (punch list), endorsed and dated by Owner's Representative.

a. The certified copy of the list shall state that each item has been completed or otherwise resolved for acceptance.

3. Submit a written request for final review for acceptance.

a. Upon receipt of request, the Owner's Representative, the Owner, agents of the respective funding agencies, and the Contractor will either proceed with the review or the Owner's Representative will notify the Contractor of unfulfilled requirements.

4. The Owner's Representative will accept the final Certificate for Payment after the review or will notify Contractor of any remaining deficiencies.

5. All forms contained in **SECTION 00 65 00 – CLOSEOUT FORMS** must be filled in, signed, and submitted to the Owner's Representative, as they apply.

A. **Technical Provisions**

1. Reserved.

01.3.04 CORRECTION PERIOD

A. A one (1) year correction period will begin on all work performed by the Contractor once the Certificate of Substantial Completion is issued as required in **Article 15.08** of **SECTION 00 72 00 – GENERAL CONDITIONS** of these Specifications.

B. The performance bond will remain in full force and effect as long as is necessary to cover any and all such guarantee or correction periods.

C. There will be a mandatory 11 – month walkthrough with the Contractor, Owner, and Engineer prior to ending of the correction period as specified in this subsection. All expenses associated with coordination and travel for Contractor to make said walkthrough, will be at the Contractor's expense.

D. **Technical Provisions**

1. Reserved.

2. The correction period as specified in part A this subsection, will begin on all work performed by the Contractor once the Certificate of Final Completion has been issued. **(PRSP)**

01.3.05 PROJECT RECORD DOCUMENTS

A. The Contractor shall submit Record Documents per **SECTION 01 78 00 – CLOSEOUT SUBMITTALS** of these Specifications.

01.3.06 OPERATION AND MAINTENANCE DATA

A. Where applicable, the Contractor shall submit operation and maintenance data to the Owner's Representative per **SECTION 01 78 00 – CLOSEOUT SUBMITTALS** of these Specifications.

01.3.07 SPARE PARTS AND MAINTENANCE MATERIALS

A. Where applicable, the Contractor shall provide products, spare parts, maintenance, and extra materials in quantities specified in individual Specification Sections.

B. Where applicable, the Contractor shall deliver and place spare parts and materials in a location as directed by the Owner and obtain receipt prior to final payment.

END OF SECTION

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PART 1 GENERAL

01.1.01 GENERAL

A. This section of the Project Manual describes the administrative and procedural requirements for closeout submittals.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

01.3.01 RECORD DRAWINGS

A. The Contractor shall submit one set of marked-up Record Prints to the Owner's Representative at the conclusion of construction.

B. Record drawings shall be maintained by the Contractor and comply with the following:

C. The Contractor shall maintain one set of prints of the Contract Drawings and Shop Drawings.

1. The Contractor shall mark record prints to show the actual installation where installation varies from that shown on the Drawings.
    a. The mark ups should be made by the individual or entity that obtained the record data, whether the individual or entity is the installer, Subcontractor, or similar entity.
    b. Give particular attention to information on concealed elements that will be difficult to identify or measure and record after completion of the work.
    c. Record data as soon as possible after obtaining it. Record and check the markup before enclosing concealed installations.
    d. Record locations of underground pipes, fittings, corporation stops, and valves.
    e. Record Drawings shall also include changes in pipe length, depths, stations, type/size of material, fittings, notes, etc.
2. The Contractor shall mark the Contract Drawings or Shop Drawings, whichever is most capable of showing actual physical conditions, completely and accurately.
    a. If Shop Drawings are marked, the cross-reference on the Contract Drawings shall be shown.
3. The Contractor shall mark record sets with erasable, red-colored pencil.
    a. The use of other colors to distinguish between changes for different categories of the Work at same location is permissible.
    b. Record sets shall be made available for review by the Owner's Representative throughout the Project.
4. The Contractor shall note Construction Change Directive numbers, alternate numbers, Change Order numbers, and similar identification, where applicable.

D. The Contractor shall maintain one copy of each submittal during the construction period for Project Record Document purposes.

E. The Contractor shall post changes and modifications to Project Record Documents as they occur.

01.3.02 OPERATION AND MAINTENANCE DATA

A. The Contractor shall submit four (4) Operation and Maintenance Manuals to the Owner's Representative prior to start-up of any equipment for which said manual are to be provided.

B. These manuals shall be received by the Owner's Representative seven (7) days before the first scheduled day of operator training, if required.

C. The Contractor shall review each O & M Manual before submitting it to the Owner's Representative to ascertain that it is acceptable in terms of providing sufficient information and data to the Owner to instruct the Owner as to how to properly and safely operate and maintain the equipment to minimize operation and maintenance costs and down time.

D. The manuals shall include:

1. Factory catalog cuts on all mechanical equipment installed indicating specific model number and detailed parts lists.
2. Shop drawings on all installed equipment bearing the Owner's Representative's stamp of acceptance.
3. Specific handwritten instructions on start-up, operation, maintenance, adjustment, trouble shooting and shut-down.
4. Maintenance schedules which describe daily, weekly, monthly, semi-annual, and annual maintenance work required for each component of the equipment.

E. The Contractor shall submit the bound copies of the Operation and Maintenance Manual (O & M) Manuals to the Owner's Representative for review and acceptance.

F. Upon acceptance, the manuals will be given to the Owner by the Owner's Representative.

END OF SECTION

PART 1 GENERAL

03.1.01 DESCRIPTION

A. This Specification includes common work results for concrete construction including, but not limited to; curb and gutters, sidewalks, driveways, valley gutters, and other concrete construction complete in place.

03.1.02 REFERENCES

A. The current publications listed below form a part of this Specification.

B. Standards

ASTM A36	Standard Specification for Carbon Structural Steel
ASTM A153	Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware
ASTM A184	Standard Specifications for Welded Deformed Steel Bar Mats for Concrete Reinforcement
ASTM A416	Standard Specification for Low-Relaxation, Seven-Wire Steel Strand for Prestressed Concrete
ASTM A615	Standard Specifications for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement
ASTM A666	Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Plate, and Flat Bar
ASTM A705	Standard Specification for Age-Hardening Stainless Steel Forgings
ASTM A706	Standard Specification for Deformed and Plain Low-Alloy Steel Bars for Concrete Reinforcement
ASTM A1064	Standard Specification for Carbon-Steel Wire and Welded Wire Reinforcement, Plain and Deformed, for Concrete
ASTM C31	Standard Practice for Making and Curing Concrete Test Specimens in the Field
ASTM C33	Standard Specification for Concrete Aggregates
ASTM C39	Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens
ASTM C94	Standard Specification for Ready-Mixed Concrete
ASTM C109	Standard Test Method for Compressive Strength of Hydraulic Cement Mortars
ASTM C136	Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates
ASTM C138	Standard Test Method for Density (Unit Weight), Yield, and Air Content (Gravimetric) of Concrete
ASTM C140	Standard Test Methods for Sampling and Testing Concrete Masonry Units and Related Units
ASTM C143	Standard Test Method for Slump of Hydraulic-Cement Concrete
ASTM C144	Standard Specification for Aggregate for Masonry Mortar
ASTM C150	Standard Specification for Portland Cement
ASTM C172	Standard Practice for Sampling Freshly Mixed Concrete
ASTM C173	Standard Test Method for Air Content of Freshly Mixed Concrete by the Volumetric Method
ASTM C191	Standard Test Methods for Time of Setting of Hydraulic Cement by Vicat Needle
ASTM C231	Standard Test Method for Air Content of Freshly Mixed Concrete by the Pressure Method
ASTM C260	Standard Specification for Air-Entraining Admixtures for Concrete
ASTM C287	Standard Specification for Chemical-Resistant Sulfur Mortar
ASTM C309	Standard Specification for Liquid Membrane-Forming Compounds for Curing Concrete
ASTM C333	Standard Specification for Lightweight Aggregates for Structural Concrete
ASTM C494	Standard Specification for Chemical Admixtures for Concrete

ASTM C595	Standard Specification for Blended Hydraulic Cements
ASTM C618	Standard Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use in Concrete
ASTM C642	Standard Test Method for Density, Absorption, and Voids in Hardened Concrete
ASTM C989	Standard Specification for Slag Cement for Use in Concrete and Mortars
ASTM C1012	Standard Test Method for Length Change of Hydraulic-Cement Mortars Exposed to a Sulfate Solution
ASTM C1017	Standard Specification for Chemical Admixtures for Use in Producing Flowing Concrete
ASTM C1064	Standard Test Method for Temperature of Freshly Mixed Hydraulic Cement Concrete
ASTM C1107	Standard Specification for Packaged Dry, Hydraulic-Cement Grout
ASTM C1157	Standard Performance Specification for Hydraulic Cement
ASTM D98	Standard Specification for Calcium Chloride
AASHTO M31	Standard Specification for Deformed and Plain Billet-Steel Bars for Concrete Reinforcement
AASHTO M32	Standard Specification for Steel Wire, Plain, for Concrete Reinforcement
AASHTO M55	Standard Method of Test for Steel Welded Wire Reinforcement, Plain, for Concrete
AASHTO M213	Standard Specification for Preformed Expansion Joint Fillers for Concrete Paving and Structural Construction
AASHTO T260	Standard Test for Sampling and Testing for Chloride Ion in Concrete and Concrete Raw Materials
ACI	American Concrete Institute
AWS	American Welding Society
MIL	Military Specifications
ACI	American Concrete Institute

03.1.03 RELATED WORK SPECIFIED ELSEWHERE

A. The following items of Related Work are specified and included in other sections of these Specifications.

SECTION 01 11 00	**SUMMARY OF WORK**
SECTION 01 22 19	**MEASUREMENT AND PAYMENT**
SECTION 01 33 00	**SUBMITTAL PROCEDURES**
SECTION 03 11 00	**CONCRETE FORMING**
SECTION 03 15 00	**CONCRETE ACCESSORIES**
SECTION 03 20 00	**CONCRETE REINFORCING**
SECTION 03 30 00	**CAST-IN-PLACE CONCRETE**
SECTION 03 35 00	**CONCRETE FINISHING**
SECTION 03 39 00	**CONCRETE CURING**
SECTION 03 60 00	**GROUTING**
SECTION 32 05 00	**COMMON WORK RESULTS FOR EARTHWORK**

03.1.04 SUBMITTALS

A. Shop drawings and product data must be submitted for concrete, reinforcing bars, expansion material, and other pertinent items in accordance with **SECTION 01 33 00 – SUBMITTAL PROCEDURES** of these Specifications.

PART 2 PRODUCTS

03.2.01 GENERAL

A. Refer to Related Work sections for applicable product details if not included herein.

B. Where the provisions contained within **SECTION 02 32 00 – GEOTECHNICAL INVESTIGATION** are more stringent than those contained in this Section, the provisions of **SECTION 02 32 00 – GEOTECHNICAL INVESTIGATION** shall govern.

PART 3 EXECUTION

03.3.01 GENERAL

A. The Contractor shall thoroughly compact concrete into its final position, assuring that it is thoroughly consolidated around fittings and embedded items. All reinforcement and embedded items must be accurately placed as shown on the plans and must be clean and free from coatings of dried mortar, detrimental rust, scale, oil, or foreign matter. The Contractor shall place concrete meeting the applicable requirements of **SECTION 03 30 00 – CAST-IN-PLACE CONCRETE** of these Specifications.

03.3.02 CONCRETE CONSISTENCY

A. The Contractor shall assure concrete is of such consistency that it will flow around reinforcing steel, but individual particles of the coarse aggregate, when isolated, show a coating of mortar containing its proportionate quantity of sand. The consistency of the concrete will be gauged by the ability of the equipment to properly place the concrete in its final position and not by the difficulty in mixing or transporting. The Contractor shall use the minimum quantity of mixing water necessary to provide workability within the ranges of slump specified.

03.3.03 CONCRETE MIXING

A. Concrete may be mixed at the site or by the ready-mix method.

B. For ready-mix concrete, the Contractor shall comply with requirements of ASTM C94, and as herein specified.

C. The Contractor shall thoroughly mix concrete to assure a uniform distribution of the materials throughout the mass. Concrete must be mixed only in quantities required for immediate use and placed within the time limits specified. Unused concrete in which initial set has begun, must be disposed of. Retempering of concrete is prohibited. Aggregates or bags of cement containing lumps or crusts of hardened material must not be used. Concrete must be mixed in an approved truck mixer meeting the requirements of ASTM C94 herein.

D. The volume of mixed concrete in the mixing drum must not exceed the manufacturer's rating, on the capacity plate.

E. A recording water metering device is always required at the primary point of the batching operation.

F. Mixing time must be recorded. Mixing time will be measured from the time all solid materials are in the drum until discharge of that batch begins.

03.3.04 TRANSPORTING CONCRETE

A. The capacity of the plant and the transportation equipment must ensure delivery at a rate that will permit proper handling, placement, and finishing at the point of delivery. The concrete delivery rate must be maintained to provide for the continuous operation of placing, handling, and finishing concrete as is practical. The interval between delivery of loads must be maintained so that layers or lifts of concrete in place do not harden before succeeding layers or lifts are placed. In general, no lift or layer of concrete can remain exposed for more than 20 minutes before being covered by fresh concrete.

B. Water must not be added to concrete in transit. Water may be introduced into the mixer at the job site under direction of the Engineer if the specified water-cement ratio is not exceeded. Water must be added in accordance with ASTM C94. The drum must revolve continuously after the introduction of the cement and water until the concrete is discharged.

C. No mixed or agitated concrete that has remained in the drum of the truck mixer more than 10 minutes without agitation can be used.

D. The Contractor shall provide a revolution counter on each truck that registers the number of revolutions of the drum.

1. The counter must be mounted such that it can be easily read by both the operator and the Engineer.

03.3.05 NIGHT LIMITATIONS

A. Concreting operations must be ceased when darkness prevents obtaining the specified placing and finishing work. Night operations may be conducted with written approval and when approved artificial lighting is provided.

03.3.06 HOT WEATHER CONCRETING

A. Hot weather is defined as job-site conditions that accelerate the rate of moisture loss or rate of cement hydration of freshly mixed concrete.

B. Hot weather concreting must be performed in accordance with ACI 305.

C. When hot weather concreting is anticipated, the Contractor shall submit a hot weather concreting plan to the Engineer for review and approval. The plan must include detailed procedures, including production, placement, finishing, curing, and protection of concrete.

D. During hot weather, or under conditions contributing to rapid setting of concrete, a shorter mixing time than specified in ANSI/ASTM C94 may be required.

E. The Contractor is solely responsible for concrete placed in hot weather. Should the concrete placed under such conditions prove unsatisfactory in any way, the Engineer may reject the work although the plans and work were carried out with the Engineer's permission.

03.3.07 COLD WEATHER CONCRETING

A. Cold weather is defined as when the weather forecast predicts air temperatures below 35°F at any time during the specified curing and protection period following concrete placement.

B. Cold weather concreting must be performed in accordance with ACI 306.

C. When cold weather concreting is anticipated, the Contractor shall submit a cold weather concreting plan to the Engineer for review and approval. The plan must include detailed procedures, including production, placement, finishing, curing, temperature monitoring, and protection of concrete.

D. Except by specific written authorization, concreting operations must cease when a descending air temperature in the shade and away from artificial heat falls below 40°F.

E. Before any concrete is placed, all ice, snow, and frost must be removed completely from the formwork receiving the concrete.

F. Heating and Placing Concrete:

1. When concreting is authorized during cold weather, the Contractor must assure that concrete temperature meets ASTM C94.

G. The Contractor is solely responsible for concrete placed in cold weather. Should the concrete placed under such conditions prove unsatisfactory in any way, the Engineer may reject the work although the plans and work were carried out with the Engineer's permission.

03.3.08 TESTING

A. All concrete must be tested by an ACI Grade I or equivalent certified testing technician. Unless otherwise specified, all testing during the on-site placement of the concrete will be subject to acceptance or rejection by the Engineer.

B. The Engineer or their representative shall be given access to the ready-mix production facility for sampling constituent materials during production to assure the materials meet these Specifications and represent those stated on the approved mix design.

C. Testing frequency and other related quality control criteria will be performed by the Contractor in accordance with the provisions of **SECTION 01 45 00 – QUALITY CONTROL** of these Specifications.

D. The following concrete tests must be performed for all concrete schedules as lined out herein.

E. Standard Slump Test:

1. The Engineer will check the consistency of the concrete by slump test during each day's placement. A slump test will also be made each time that strength specimens are made. Slump tests are performed meeting ASTM C143.

F. Compression Tests:

1. A minimum of three specimens, 6-inch in diameter or 4-inch, must be made and tested for every concrete placement. One set of test cylinders must be molded and tested for every 100 yards of concrete or fraction thereof placed each day. On a given project, if the total volume of concrete is such that frequency of testing required above would generate less than 5 strength tests for a given class of concrete, tests must be made from at least 5 randomly selected batches or from each batch if fewer than 5 batches are used. These cylinders must be cured under laboratory conditions except that additional test cylinders cured entirely under field conditions may be required by the Engineer to check the adequacy of curing and protection of the concrete.

2. Samples for strength tests must be taken in accordance with ASTM C172.

3. The molding of test cylinders and laboratory curing must be performed in accordance with ASTM C31.

4. Cylinders must be tested in accordance with ASTM C39, using an independent testing laboratory, as approved by the Engineer.

5. Of each of the 3 cylinders taken for a pour, one must be tested for information strength at 7 days and two must be tested for acceptance strength at 28 days. To meet this Specification, average strength of two cylinders from the same sample, tested at 28 days or the specified earlier age, is required for each strength test. Strength level of an individual class of concrete is considered satisfactory if both of the following requirements are met:

   a. The average of all sets of 3 consecutive tests equals or exceeds the specified strength.

   b. No individual strength test (average of two cylinders) falls below specified strength by more than 500 psi (3400 kPa).

6. Field-cured test cylinders must be molded in accordance with ASTM C31 at the same time and from the same samples as laboratory-cured test cylinders. Procedures for protecting and curing concrete must be improved when strength of field-cured cylinders at the test age designated for measuring specified strength is less than 85 percent of that of companion laboratory-cured cylinders. When laboratory-cured cylinder strengths are appreciably higher than the specified strength, field-cured cylinder strengths need not exceed the specified strength by more than 500 psi (3400 kPa) even though the 85 percent criterion is met.

7. The strengths of any specimens cured on the job are to indicate the adequacy of protection and curing of the concrete and may be used to determine when the forms may be stripped, shoring removed, or the structure placed in service. When the strengths of the job-cured specimens are below those specified above, the Contractor shall improve the procedures for protecting and curing the concrete.

8. When concrete fails to meet the requirements above or when tests of field-cured cylinders indicate deficiencies in protection and curing, the Owner's representative may order tests on the hardened concrete under Chapter 17.3 of ACI-301-84 or order load tests in Chapter 20 of the ACI Building Code (ACI 318-83) for that portion of the structure where the questionable concrete has been placed. In the event the load or core tests indicate that the structure is unsatisfactory, the Contractor shall make all modifications as directed by the Engineer to make the structure sound. If the load or core tests indicate the concrete is satisfactory, all cost of testing shall be paid by Owner.

G. Air Content Tests:

1. The Engineer will during each strength test, check the air content by either the "Method of Test for Air Content of Freshly Mixed Concrete by the Pressure Method" (ASTM C231), "Method of Test for Air Content of Freshly Mixed Concrete by the Volumetric Method" (ASTM C173), or "Method of Test for Unit Weight, Yield and Air Content (Gravimetric) of Concrete" (ASTM C138).

H. Temperature Tests:

1. Concrete temperature will be measured in accordance with ASTM C1064. Temperature must be tested hourly when air temperature is 40°F and below, and when 80°F and above; and each time a set of compression test specimens is made.

END OF SECTION

PART 1 GENERAL

03.1.01 DESCRIPTION OF THE WORK

This section consists of concrete schedules to indicate the class of concrete required for the various components of cast-in-place concrete as shown on the Drawings and as specified herein.

03.1.02 RELATED WORK SPECIFIED ELSEWHERE

The following items of related work are specified and included in other sections of this Project Manual:

SECTION 01 11 00 SUMMARY OF WORK
SECTION 01 33 00 SUBMITTAL PROCEDURES
SECTION 03 30 00 CAST-IN-PLACE CONCRETE

PART 2 PRODUCTS

Concrete shall conform to the following classifications based on the application noted in the following schedule. The requirements for each classification are detailed in **SECTION 03 30 00 – CAST-IN-PLACE CONCRETE** of this Project Manual.

COMPONENT OR DESCRIPTION	CONCRETE CLASS
Concrete Floor Toppings	Class AA with 3/8" maximum Coarse Aggregate Size, Fiber Reinforced, no air entrainment
Structures	Class AAA

PART 3 CONSTRUCTION REQUIREMENTS (NOT USED)

END OF SECTION

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PART 1 GENERAL

03.1.01 DESCRIPTION OF THE WORK

A. This Specification consists of concrete forming and all appurtenances thereto required for the placement of cast-in-place concrete as shown on the Drawings and as specified herein.

03.1.02 REFERENCES

A. Reserved.

03.1.03 RELATED WORK SPECIFIED ELSEWHERE

A. The following items of related work are specified and included in other sections of these Specifications:

SECTION 01 11 00 SUMMARY OF WORK
SECTION 01 22 19 MEASUREMENT AND PAYMENT
SECTION 01 33 00 SUBMITTAL PROCEDURES
SECTION 03 05 00 COMMON WORK RESULTS FOR CONCRETE
SECTION 03 30 00 CAST-IN-PLACE CONCRETE

03.1.04 SUBMITTALS

A. Shop drawings and product data must be submitted in accordance with **SECTION 01 33 00 – SUBMITTAL PROCEDURES** for the following:

1. All materials associated with formwork that will remain embedded or attached to the concrete.
2. Form ties.
3. Form release agents.

PART 2 PRODUCTS

03.2.01 FORMS

A. Forms must be of suitable material and must be of the type, size, shape, quality, and strength to build the structure as designed on the Drawings.

B. The surfaces of forms must be smooth and free from irregularities, dents, sags, and holes.

C. Forms must include 3/4-inch chamfer strips at all corners of the formwork to produce beveled edges on exposed edges unless noted otherwise.

D. Forms must include temporary openings at the base of column and wall formwork and at other locations where necessary to facilitate cleaning and inspection prior to the placement of the concrete.

03.2.02 FORM RELEASE AGENTS

A. Form coating or releasing agent must be a non-oil-based compound completely compatible with the membrane curing compound used and which does not stain concrete.

B. Form release agents for use inside basins containing potable water must be non-toxic, non-staining, and leave no residual on the formed surface.

C. **Technical Provisions**

1. Reserved.

03.2.03 FORM TIES

A. Form ties must be factory-fabricated, removable, or snap-off metal ties of a design that will not permit form deflection and will not spall concrete upon removal.

1. Solid backing must be provided for each tie. Ties must be fitted with devices that will leave holes in the concrete surface not less than 3/8-inch nor more than 1-inch in diameter and not more than 1-inch deep, except as noted below:

    a. That portion of the tie remaining permanently in the concrete must not project beyond the surface of the concrete and must be at least 1-inch back from any concrete surface that will be exposed, painted, damp proofed, or will receive direct applications of plaster.

    b. Bolts and rods that are to be completely withdrawn must be coated with a non-staining bond breaker.

    c. All form ties must be snapped off beneath the concrete surfaces on all construction.

B. Form ties used for liquid retaining structures must be fitted on both ends with cones which will form a void at least 1-1/2 inches deep at least 1-inch diameter at the surface in order to provide suitable space for dry-patching mortar.

1. In lieu of this, at the Contractor's option, similar recesses may be formed by reaming with power tools as approved immediately after forms are removed.

2. Form ties to be completely removed from the concrete must not be used for liquid containing structures unless the method of sealing of holes is accepted by the Owner's Representative in writing.

3. The ties used for liquid containing structures must be fitted with integral water seals on the portion remaining within the concrete.

PART 3 EXECUTION

03.3.01 GENERAL

A. The Contractor shall furnish all equipment, labor, materials, and tools necessary to erect and remove concrete formwork as required for cast-in-place concrete as shown on the Drawings and specified herein.

03.3.02 MATERIALS STORAGE

A. All materials must be stored in a manner which protects them from dampness, damage, and freezing.

03.3.03 COLD WEATHER CONCRETING

A. All concrete forms with which the concrete is to come in contact must be free from frost.

B. The Contractor shall drill holes in the forms and provide thermometer wells 1/2-inch to 1-inch in depth where required by the Owner's Representative to determine the temperature of the concrete.

03.3.04 FORMS

A. Concrete must not be placed until all the forms and reinforcements have been reviewed by the Owner's Representative.

1. The forms must be true to line and grade and must be mortar-tight and sufficiently rigid to prevent displacement and sagging between supports.

2. Flexible or curved metal forms must be used to fit specified curvatures.

3. The Contractor shall bear the responsibility for the adequacy and design of all forms and falsework.

B. The Contractor shall ensure that formwork is held firmly against hardened concrete to prevent offsets or loss of mortar at construction joints and to maintain a flush surface across the joint.

C. The internal ties must be arranged so that, when the forms are removed, no metal will show in the concrete surface or discolor the surface when exposed to weathering.

D. The Contractor shall clean all debris from within the forms just prior to the placement of the concrete.

1. Openings in the forms at the base of columns and walls must be used to accommodate this cleaning.

2. The Contractor shall secure all cleaning access panels in the forms prior to placing the concrete.

E. All forms must be coated with a non-staining form release agent which is to be applied shortly before the concrete is placed.

F. Forms must be constructed so that they can be removed without injuring the concrete or concrete surface.

G. Forms supported by falsework under slabs, beams, girders, arches, and similar construction must not be removed until tests indicate that at least 70% of the design strength of the concrete has developed nor sooner than 5 days after the concrete is cast.

1. The Contractor shall cast additional test cylinders which are to be cured with the same protection as the work they represent per the requirements of **SECTION 03 05 00 – COMMON WORK RESULTS FOR CONCRETE** of these Specifications.

2. These cylinders will be used for determining when the shoring can be removed.

03.3.05 COORDINATION WITH OTHER TRADES

A. Project coordination will comply with **SECTION 01 31 00 – PROJECT MANAGEMENT AND COORDINATION** of these Specifications.

B. All Subcontractors whose work is related to, embedded in, or supported by the concrete, shall be given ample notice and opportunity to furnish and/or incorporate their work before the closing of the forms and placement of concrete.

03.3.06 CURING AND PROTECTION

A. The forms for slabs and beams must remain in place for the full duration of the curing period unless approved otherwise by the Owner's Representative.

03.3.07 STRIPPING FORMS

A. The Contractor shall remove forms when the concrete is sufficiently set to prevent chipping or spalling. When forms are removed before the curing period has expired, the Contractor shall protect the concrete edges with moist earth or spray edges with curing compound. Forms must be cleaned, oiled, and examined for defects before they are used again.

END OF SECTION

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PART 1 GENERAL

03.1.01 DESCRIPTION OF THE WORK

A. This Specification consists of concrete accessories including expansion joints, inserts, waterstops, and all appurtenances thereto required for the placement of cast-in-place concrete as shown on the Drawings and as specified herein.

03.1.02 REFERENCES

A. The current publications listed below form a part of this Specification.

B. Standards

ASTM D1751	Standard Specification for Preformed Expansion Joint Filler for Concrete Paving and Structural Construction
ASTM D6690	Standard Specifications for Joint and Crack Sealants, Hot Applied, for Concrete and Asphalt Pavements
USACE CRD-C572	Specifications for Polyvinylchloride Waterstop

03.1.03 RELATED WORK SPECIFIED ELSEWHERE

A. The following items of related work are specified and included in other sections of these Specifications:

SECTION 01 11 00 SUMMARY OF WORK
SECTION 01 22 19 MEASUREMENT AND PAYMENT
SECTION 01 33 00 SUBMITTAL PROCEDURES
SECTION 03 05 00 COMMON WORK RESULTS FOR CONCRETE
SECTION 03 30 00 CAST-IN-PLACE CONCRETE

03.1.04 SUBMITTALS

A. Submit shop drawings and product data must be submitted in accordance with **SECTION 01 33 00 – SUBMITTAL PROCEDURES** for the following:

1. Waterstop materials.
2. Inserts, including product data and structural capacities.
3. Expansion joint materials, if required.
4. Any other accessory materials to be utilized.

PART 2 PRODUCTS

03.2.01 EXPANSION JOINT MATERIAL

A. Expansion Joint Material must be used in expansion joints as shown on the Drawings.

B. Expansion joint material must be of the type shown on the Drawings. Where a type of material is not called out on the Drawings, the Contractor may use any of the types described below.

1. Pre-molded Bituminous Fiber

   a. Pre-molded Bituminous Fiber or Bituminous Felt must consist of preformed strips of one (1) continuous piece per joint which have been formed from cane or other similar fibers of cellular nature securely bound together and uniformly impregnated with an asphaltic binder conforming to ASTM D1751.

2. Flexible Foam Joint Filler

   a. Flexible foam preformed joint filler must be gray in color to closely match the color of the concrete.

b. **Technical Provisions**

i. Reserved.

ii. Flexible foam joint filler must be Pressure Relief as distributed by W.R. Meadows, Inc., or prior approved equal. **(WILL_OFF)**

3. Hot-poured Sealant

a. Expansion joints exposed to the weather must be sealed with a hot-poured "Para Plastic" rubberized asphalt sealing compound conforming to ASTM D6690.

C. Interior expansion joints must be sealed with non-sag caulk of a color to match the concrete.

03.2.02 PREFORMED WATERSTOPS

A. Unless otherwise shown on the Drawings or specified in these Specifications, waterstops must be extruded from virgin polyvinyl chloride plastic resins conforming to:

1. U.S. Army Corps of Engineers waterstop specification CRD-C572, latest edition.

2. All PVC waterstops must be 6 inches wide and 3/8-inch thick and have center bulbs and serrated surfaces unless shown otherwise on the Drawings.

3. The serrations must extend no less than 0.3125-inch from the surface of the waterstop.

B. PVC waterstops may be substituted where moldable waterstops are shown on the plans.

C. PVC waterstops must be prefabricated from the waterstop manufacturer for all joints with the exception of butt splices.

03.2.03 MOLDABLE WATERSTOP/JOINT SEALER

A. Moldable waterstops must be placed at the locations shown on the Drawings.

B. Moldable waterstops must not be substituted for PVC waterstops.

C. **Technical Provisions**

1. Reserved.

2. Moldable waterstop/joint sealer must be Waterstop-RX as manufactured by American Colloid Company, or prior approved equal.

03.2.04 WALL SLEEVES

A. Wall sleeves must be provided for all penetrations that require a modular mechanical seal.

B. Wall sleeves must be made of PVC or HDPE and must include an integral waterstop.

C. **Technical Provisions**

1. Reserved.

2. Wall sleeves must be Model PWS as manufactured by Advanced Products and Systems or;

3. Century Line as manufactured by GPT or;

4. prior approved equal.

03.2.05 VAPOR BARRIERS

A. Vapor barriers must be polyethylene sheeting conforming to Commercial Standard, not less than 6 mil thickness.

B. Vapor barriers must be installed under floors to receive a finish covering such as tile or carpet and where shown on the Drawings.

03.2.06 CONCRETE BONDING AGENT

A. A bonding agent must be used on all surfaces where structural topping is to be installed, and any other areas where fresh concrete is to be installed adjacent to or over existing concrete.

B. All construction joints in water or wastewater containment basins and below-grade basements and dry wells must have a bonding agent applied to the construction joint prior to placing the next lift or section of new concrete.

C. The bonding agent must be mixed and applied according to the manufacturer's recommendations.

D. **Technical Provisions**

1. Reserved.

2. Bonding agents must be Thorobond, Acryl 60, or prior approved equal.

PART 3 EXECUTION

03.3.01 GENERAL

A. The Contractor shall furnish all equipment, labor, materials, and tools necessary to construct concrete accessories as required for cast-in-place concrete as shown on the Drawings and specified herein.

03.3.02 MATERIALS STORAGE

A. All materials must be stored in a manner, which protects them from dampness, damage, and freezing.

03.3.03 EXPANSION JOINTS

A. The Contractor shall install pre-formed joint filler between concrete and any fixed structure, such as a buildings, bridges, or utility poles etc. All expansion joint materials must extend the full depth of the concrete. Isolation joints must be placed at radius points, junctions with existing concrete, and opposite to or at expansion joints in adjacent concrete. Contractor shall form cold joints at unions of consecutive pours as shown on the Drawings or directed by the Engineer. The cold joint shall be vertical, the full depth of the concrete, and tooled to a 1/4 - inch radius.

B. Expansion joint filler material must be securely fastened to the surface of existing concrete before subsequent concrete is cast against the joint.

C. Joints must be sealed within fourteen (14) days after they are installed.

03.3.04 WATERSTOPS

A. PVC waterstops that are to be placed in joints must be positioned accurately in accordance with the Drawings and supported against displacement with wire ties prior to placement of concrete.

1. Wire ties must not penetrate the waterstop at any location that is further than one inch from the edge of the waterstop.

B. Concrete surfaces to which moldable waterstops are to be attached must be coated with a primer recommended by the manufacturer.

1. Moldable waterstops must be fastened to the concrete surfaces with concrete nails at 12" intervals.

03.3.05 EMBEDDED ITEMS

A. Inserted items must be true to line and grade and must be mortar-tight and sufficiently secured to prevent displacement during placement of the concrete.

03.3.06 COORDINATION WITH OTHER TRADES

A. Project coordination must comply with **SECTION 01 31 00 – PROJECT MANAGEMENT AND COORDINATION** of these Specifications.

B. All Subcontractors, whose work is related to, embedded on, or supported by the concrete, shall be given ample notice and opportunity to introduce and/or furnish embedded items before closing of the forms and placement of concrete.

END OF SECTION

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PART 1 GENERAL

03.1.01 DESCRIPTION

A. This Specification includes work for furnishing and placing reinforcing steel or wire fabric meeting the quality, type, and size specified in the contract.

03.1.02 REFERENCES

A. The current publications listed below form a part of this Specification.

B. Standards

ASTM A184	Standard Specifications for Welded Deformed Steel Bar Mats for Concrete Reinforcement
ASTM A615	Standard Specifications for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement
ASTM A705	Standard Specification for Age-Hardening Stainless Steel Forgings
ASTM A1064	Standard Specification for Carbon-Steel Wire and Welded Wire Reinforcement, Plain and Deformed, for Concrete
AASHTO M31	Standard Specification for Deformed and Plain Billet-Steel Bars for Concrete Reinforcement
AASHTO M32	Standard Specification for Steel Wire, Plain, for Concrete Reinforcement
AASHTO M55	Standard Method of Test for Steel Welded Wire Reinforcement, Plain, for Concrete
ACI	American Concrete Institute

03.1.03 RELATED WORK SPECIFIED ELSEWHERE

A. The following items of related work are specified and included in other sections of these Specifications.

SECTION 01 11 00	**SUMMARY OF WORK**
SECTION 01 22 19	**MEASUREMENT AND PAYMENT**
SECTION 01 33 00	**SUBMITTAL PROCEDURES**
SECTION 03 05 00	**COMMON WORK RESULTS FOR CONCRETE**
SECTION 03 30 00	**CAST-IN-PLACE CONCRETE**

03.1.04 SUBMITTALS

A. The Contractor shall submit shop drawings and product data in accordance with **SECTION 01 33 00 – SUBMITTAL PROCEDURES** for reinforcing steel and accessories.

B. Shop drawings must indicate bending diagrams, assembly diagrams, lap splices, shapes, and details of reinforcing bars and accessories.

C. Reinforcing steel shop drawings must be prepared in accordance with Manual of Standard Practice for Detailing Reinforced Concrete Structures, ACI 315.

D. Bar lengths must be based on dimensions shown on the Drawings, not scaled dimensions.

PART 2 PRODUCTS

03.2.01 BAR REINFORCEMENT

A. Furnished deformed reinforcement steel must meet the requirements of ASTM A615, (AASHTO M31) or ASTM A705, Grade 40 or Grade 60.

1. Small quantities purchased from warehouses may, at the Engineer's direction, be accepted if bend tested under ASTM A615 or AASHTO M31. The test specimen must cold bend around a pin without cracking on the outside of the bent portion.

B. Bars which are to be welded must be Grade 60 and must conform to ASTM A706.

C. Minimum Bend Requirements:

1. Where bars are to be bent, the diameter of the bend measured on the inside of the bar, other than for stirrups and ties, must not be less than the following values:

BAR SIZE	MINIMUM DIAMETER
#3 through #8	6 bar diameters
#9, #10, and #11	8 bar diameters
#14 and #18	10 bar diameters

2. Inside diameter of bends for stirrups and ties must not be less than 4 bar diameters for #5 bar and smaller. For #6 bar and larger, minimum bend diameter must be as shown in the above table.

3. All reinforcement must be bent cold unless otherwise permitted by the Owner's Representative.

4. At the time that concrete is placed, metal reinforcement must be free from mud, oil, or other nonmetallic coatings that adversely affect bonding capacity.

5. Metal reinforcement with rust, mill scale, or a combination of both will be considered satisfactory provided that the minimum dimensions (including height of deformations) and weight of a hand-wire brushed test specimen are not less than the applicable ASTM specification requirements.

03.2.02 BAR SUPPORTS

A. Approved bar supports must be used to support reinforcing bars.

1. Pre-molded concrete blocks must be used at the bottom of slabs on grade having a minimum 4 square inches bearing area and having a compressive strength equal to the concrete being placed.

2. Bar spacers made of steel must be used between layers of bars. These must have sufficient strength to support construction loads without deformation.

3. Steel bar spacers must not come in contact with the forms.

4. Bolsters with non-corroding feet must be used to support bars on suspended slabs.

5. Bolsters with non-corroding feet must be used to provide the spacing required between reinforcing steel and formed wall surfaces.

03.2.03 WIRE AND WIRE MESH

A. Furnished wire must meet cold-drawn steel wire AASHTO M32 requirements.

B. Furnished wire mesh for concrete reinforcement must meet AASHTO M55 and ASTM A1064 requirements.

C. Furnished bar mats must meet ASTM A184 requirements.

D. Tie wire must be No. 16 gauge annealed wire.

03.2.04 REBAR SPLICE SYSTEM

A. Technical Provisions

1. Reserved.

2. The rebar splice system must be Grade 60 and as manufactured by Richmond Screw Anchor Co., Inc. or an approved equal.

3. For dowel bar substitution and rebar splice systems other than Richmond Screw Anchor Co., Inc., the Contractor shall submit manufacturer's literature, product samples, and certified test reports to the Owner's Representative.

a. Test reports must show yield and ultimate tensile load capacities. All male threads must be rolled (UN or UNC); cut threads are not permitted. Tension failure must occur in the nominal bar diameter of the Dowel-In.

03.2.05 MECHANICAL SPLICES

A. Mechanical reinforcement bar splices must be made with devices that are capable of transferring 125% of the yield strength of the bar size being joined across the splice.

PART 3 EXECUTION

03.3.01 GENERAL

A. The Contractor shall furnish all labor, materials, and services necessary for the construction of all reinforcement and appurtenances thereto as shown on the Drawings and specified herein.

03.3.02 PROTECTION

A. The Contractor shall protect steel reinforcement from damage at all times. Steel must be placed free from dirt, detrimental scale, paint, oil, and other foreign substance. The Contractor shall clean steel reinforcement having easily removed rust, loose scale, and dust using an approved method.

B. All materials shall be stored in a manner which protects them from dampness, damage, and freezing.

C. Reinforcing steel must not be stored in direct contact with the ground.

03.3.03 FABRICATION

A. The Contractor shall not field bend bars, unless specified. If field bending is specified, the Contractor shall bend reinforcing bars cold. The Contractor shall not field bend any bar partially imbedded in concrete, except as specified on the plans.

B. Bar reinforcement must be shipped in standard bundles, tagged, and marked meeting ACI 315 requirements.

C. Concrete reinforcement and accessory details not covered herein or on the drawings, must meet ACI 315 requirements.

03.3.04 PLACING AND FASTENING

A. The Contractor shall accurately place and hold firm all steel reinforcement in the plan locations as concrete is being placed.

B. All reinforcement must be supported and fastened to prevent displacement due to construction loads. Approved bar chairs and spacers must be used over form work. For concrete surfaces exposed to the weather in the finished structure, the Contractor shall assure the portions of all accessories within 1/2 inch of the concrete surface are noncorrosive or protected against corrosion.

C. The Contractor shall overlap welded wire fabric for successive mats or rolls providing an overlap measured between outermost cross wires of each fabric sheet at least 2 inches. The fabric must be extended across supporting beams and walls to within 4 inches of concrete edges. It may extend through contraction joints. Fabric must be adequately supported during concrete placement to maintain its position in the slab using the methods previously described or by laying the fabric on a concrete layer of the required depth before placing the upper slab layer.

D. The Contractor shall offset vertical bars in columns at least one bar diameter at lap splices. Templates must be furnished for all column dowels.

E. Reinforcing bars must be free of ice, loose rust, and loose mill scale prior to placement of the concrete.

F. Splices must be lapped as shown on the Drawings.

1. Bars must not be welded, flame cut, or heated.

2. Splices for direct tension ties must be mechanical.

G. All splices must be staggered unless noted otherwise.

H. The Contractor shall obtain Engineer approval for all splices not shown on the plans. Mechanical connectors for reinforcing bars may be used if approved.

I. The Contractor shall not use pebbles, pieces of broken stone, concrete rubble, broken brick or building blocks, metal pipe, or wooden block to position the fabric.

J. The Contractor shall follow the minimum concrete protective covering for reinforcement below.

1. Concrete deposited against ground — 3 inches
2. Formed surfaces exposed to weather or in contact with the ground:
   a. #6 bars or larger — 2 inches
   b. Smaller than #6 — 1 1/2 inches
3. Interior surfaces:
   a. Beams, girders, and columns — 1 1/2 inches
   b. Slabs, walls, and joists:
      i. #11 bars or smaller — 3/4 inches
      ii. #14 and #18 bars — 1 1/2 inches

K. Fabric reinforcement shipped in rolls must be straightened into flat sheets before being placed.

03.3.05 REINFORCEMENT THROUGH EXPANSION JOINTS

A. The Contractor shall not continue reinforcement or other embedded metal items bonded to the concrete through expansion joints.

B. Dowels bonded on only one side of a joint and waterstops must extend through the joint.

03.3.06 COLD WEATHER CONCRETING

A. All concrete reinforcement, with which the concrete is to come in contact with must be free from frost.

03.3.07 EMBEDDED ITEMS

A. Clear cover between embedded items and reinforcing steel must be at least two inches.

03.3.08 PLACING CONCRETE

A. Vibrators must be manipulated so as not to displace reinforcement or forms.

03.3.09 DEFECTIVE WORK

A. Concrete placed prior to the Engineer's approval of reinforcing is subject to removal at no additional cost to the Owner.

B. The Contractor shall correct any defective work with regard to reinforcement and its placement prior to the casting of the concrete.

END OF SECTION

PART 1 GENERAL

03.1.01 DESCRIPTION OF THE WORK

This section consists of concrete reinforcement and appurtenances thereto constructed in accordance with this Project Manual and placed at the locations shown on the Drawings.

03.1.02 RELATED WORK SPECIFIED ELSEWHERE

The following items of related work are specified and included in other sections of this Project Manual:

SECTION 01 11 00 SUMMARY OF THE WORK
SECTION 01 33 00 SUBMITTAL PROCEDURES
SECTION 03 11 00 CONCRETE FORMING
SECTION 03 30 00 CAST-IN-PLACE CONCRETE

03.1.03 SUBMITTALS

A. Submit shop drawings in accordance with **SECTION 01 33 00 SUBMITTAL PROCEDURES** for reinforcing steel and accessories.

B. Shop drawings shall indicate bending diagrams, assembly diagrams, lap splices, shapes and details of reinforcing bars and accessories.

C. Reinforcing steel shop drawings shall be prepared in accordance with Manual of Standard Practice for Detailing Reinforced Concrete Structures, ACI 315.

D. Bar lengths shall be based on dimensions shown on the Drawings, not scaled dimensions.

PART 2 PRODUCTS

03.2.01 REINFORCING STEEL

A. Reinforcing steel shall be Grade 60 deformed bars conforming to ASTM A615.

B. Bars which are to be welded shall be Grade 60 and shall conform to ASTM A706.

C. Wire mesh reinforcing shall comply with the requirements of ASTM A 185 or ASTM A 82.

D. Tie wire shall be No. 16 gauge annealed wire.

E. Approved bar supports shall be used to support reinforcing bars.

1. Pre-molded concrete blocks shall be used at the bottom of slabs on grade.
2. Bar spacers made of steel shall be used between layers of bars. These shall have sufficient strength to support construction loads without deformation.
3. Steel bar spacers shall not come in contact with the forms.
4. Bolsters with non-corroding feet shall be used to support bars on suspended slabs.
5. Bolsters with non-corroding feet shall be used to provide the spacing required between reinforcing steel and formed wall surfaces.

F. Minimum Bend Requirements:

1. Where bars are to be bent, the diameter of the bend measured on the inside of the bar, other than for stirrups and ties, shall not be less than the following values:

BAR SIZE	MINIMUM DIAMETER
#3 through #8	6 bar diameters
#9, #10, and #11	8 bar diameters
#14 and #18	10 bar diameters

2. Inside diameter of bends for stirrups and ties shall not be less than 4 bar diameters for #5 bar and smaller. For #6 bar and larger, minimum bend diameter shall be as shown in the above table.

3. All reinforcement shall be bent cold unless otherwise permitted by the Owner's Representative.

4. At the time that concrete is placed, metal reinforcement shall be free from mud, oil, or other nonmetallic coatings that adversely affect bonding capacity.

5. Metal reinforcement with rust, mill scale, or a combination of both shall be considered satisfactory provided that the minimum dimensions (including height of deformations) and weight of a hand-wire brushed test specimen are not less than the applicable ASTM specification requirements.

03.2.02 REBAR SPLICE SYSTEM

A. Rebar splice system shall be Grade 60 and as manufactured by Richmond Screw Anchor Co., Inc. or an approved equal.

B. For dowel bar substitution and rebar splice systems other than Richmond Screw Anchor Co., Inc., the Contractor shall submit manufacturer's literature, product samples and certified test reports to the Owner's Representative.

1. Test reports shall show yield and ultimate tensile load capacities. All male threads shall be rolled (UN or UNC); cut threads are not permitted. Tension failure must occur in the nominal bar diameter of the Dowel-In.

03.2.03 MECHANICAL SPLICES

Mechanical reinforcement bar splices shall be made with devices that are capable of transferring 125% of the yield strength of the bar size being joined across the splice.

PART 3 CONSTRUCTION REQUIREMENTS

03.3.01 GENERAL

A. The Contractor shall furnish all labor, materials and services necessary for the construction of all reinforcement and appurtenances thereto as shown on the Drawings and specified herein.

B. All work shall be subject to the review of the Owner's Representative.

03.3.02 MATERIALS STORAGE

All materials shall be stored in a manner which protects them from dampness, damage and freezing when required.

03.3.03 COLD WEATHER CONCRETING

All concrete reinforcement, with which the concrete is to come in contact with shall be free from frost.

03.3.04 PLACING REINFORCEMENT

A. Reinforcement shall be free of materials deleterious to bond.

B. Reinforcement shall be placed in a manner that preserves the minimum concrete cover over the reinforcing and to embedded items as shown on the Drawings and specified herein.

C. All reinforcement shall be placed within +/- 3/8 inch of the locations shown on the Drawings and held firmly in position during placement of concrete.

D. Reinforcing bars shall be fastened together at intersections.

E. Shop drawing lists and bending details shall be supplied by the Contractor to the Owner's Representative.

F. Reinforcing bars shall be free of ice, loose rust and loose mill scale prior to placement of the concrete.

G. Splices shall be welded or lapped as shown on the Drawings.

1. Welding shall only be used on reinforcement conforming to ASTM A706.
2. Splices for direct tension ties shall be mechanical or welded.

H. All splices shall be staggered unless noted otherwise.

I. Location of splices not shown on the Drawings shall be approved by the Owner's Representative.

03.3.05 FIELD BENDING OR STRAIGHTENING

When permitted, bend or straighten reinforcement partially embedded in concrete in accordance with the following procedures:

A. Reinforcing bar sizes No. 3 (Metric size 10) to No. 5 (Metric size 16) may be bent cold the first time provided reinforcing bar temperature is above 32° F.

B. Reinforcing bars sizes No. 6 (Metric size 19) and larger shall be preheated before bending.

1. Apply heat by any method that does not harm the reinforcing bar material or cause damage to the concrete
2. Preheat a length of reinforcing bar equal to at least 5 bar diameters in each direction from the center of the bend but do not extend preheating below the surface of the concrete.
3. Do not allow the temperature of the reinforcing bar at the concrete interface to exceed 500 F.
4. The preheat temperature of the reinforcing bar shall be between 1100° F and 1200° F.
5. Maintain the preheat temperature until bending or straightening is complete.
6. Measure the preheat temperature by temperature measurement crayons, contact pyrometer or other acceptable methods.
7. Do not artificially cool heated reinforcing bars until the temperature of the bar is less than 600° F.

03.3.06 REINFORCEMENT THROUGH EXPANSION JOINTS

A. Do not continue reinforcement or other embedded metal items bonded to the concrete through expansion joints.

B. Dowels bonded on only one side of a joint and waterstops shall extend through the joint.

03.3.07 EMBEDDED ITEMS

Clear cover between embedded items and reinforcing steel shall be at least two inches

03.3.08 PLACING CONCRETE

Vibrators shall be manipulated so as not to displace reinforcement or forms.

03.3.09 DEFECTIVE WORK

The Contractor shall correct any defective work with regard to reinforcement and its placement prior to the casting of the concrete.

END OF SECTION

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PART 1 GENERAL

03.1.01 DESCRIPTION

A. This Specification includes work for the construction of various cast-in-place concrete.

03.1.02 REFERENCES

A. The current publications listed below form a part of this Specification.

B. Standards

ACI American Concrete Institute

03.1.03 RELATED WORK SPECIFIED ELSEWHERE

A. The following items of related work are specified and included in other sections of these Specifications:

SECTION 01 11 00 SUMMARY OF WORK
SECTION 01 22 19 MEASUREMENT AND PAYMENT
SECTION 01 33 00 SUBMITTAL PROCEDURES
SECTION 03 05 00 COMMON WORK RESULTS FOR CONCRETE
SECTION 03 11 00 CONCRETE FORMING
SECTION 03 15 00 CONCRETE ACCESSORIES
SECTION 03 20 00 CONCRETE REINFORCING
SECTION 03 35 00 CONCRETE FINISHING
SECTION 03 39 00 CONCRETE CURING

03.1.04 SUBMITTALS

A. Shop drawings and product data must be submitted for concrete, reinforcing bars, expansion material, and other pertinent items in accordance with **SECTION 01 33 00 – SUBMITTAL PROCEDURES** of these Specifications.

B. The Contractor shall submit proposed construction joints and contraction joints. Any differences from those indicated on the Drawings must be noted.

PART 2 PRODUCTS

03.2.01 GENERAL

A. Only approved materials, conforming to the requirements of these Specifications will be used in the work.

03.2.02 CLASSIFICATION

A. These Specifications divide the concrete into five classes as follows:

CLASS	COMPRESSIVE STRENGTH AT 28 DAYS (psi)
AAA	4500
AA	4000
CLSM	60

B. All concrete must be air entrained unless noted otherwise or approved by the Owner's Representative.

C. Concrete to be used for any item of work must be of the 4000-psi class as shown above unless noted otherwise.

D. Concrete from the 4000-psi and the 4500-psi classes as shown above must have a minimum cement content of six (6) sacks per cubic yard.

PART 3 EXECUTION

03.3.01 GENERAL

A. The Contractor shall furnish all labor, materials and services necessary for the completion of all work as shown on the Drawings and specified herein. All work will be subject to the review of the Owner's Representative.

03.3.02 MATERIALS STORAGE

A. All materials must be stored and handled in a manner to insure the preservation of their quality and fitness for use and which protects them from dampness, damage, and freezing.

03.3.03 EMBEDDED ITEMS

A. Before placing concrete, any items that are to be embedded must be firmly and securely fastened in place as indicated.

B. Embedded items must be clean and free from rust, scale, oil, or any foreign matter.

C. The embedding of wood must be avoided.

D. The concrete must be consolidated around and against embedded items.

E. Clear cover between embedded items and reinforcing steel must be at least two inches.

F. All Subcontractors whose work is related to, embedded in, or supported by the concrete, shall be given ample notice and opportunity to furnish and/or incorporate their work before the closing of the forms and placement of concrete.

03.3.04 PLACING CONCRETE

A. All equipment for handling and transporting materials and concrete must be clean before any material or concrete is placed therein.

B. All concrete must be placed during daylight, unless otherwise approved.

C. The concrete must not be placed until the depth and character of the foundation, the adequacy of forms and falsework, and the placing of steel reinforcement have been reviewed by the Owner's Representative.

D. Concrete must be placed as soon as practical after mixing, and no later than 90 minutes after water has been added to the mix, unless otherwise approved by the Engineer with consideration of admixtures used.

1. No water may be added after 60 minutes.

E. The method and manner of placing will be such to avoid segregation and displacement of the foundation, forms, and reinforcement.

1. Troughs, pipes, and chutes must be used as an aid in placing concrete when necessary.
2. Dropping the concrete a distance of more than five (5) feet, or depositing a large quantity at one point, will not be permitted.

F. Concrete must be placed upon clean surfaces, free from running water, or upon properly consolidated damp soil.

G. All concrete must be consolidated by suitable mechanical vibrators.

1. When necessary, vibrating may be supplemented by hand spading with suitable tools to assure proper and adequate consolidation.
2. Vibrators must be manipulated so as not to displace reinforcement or forms.
3. The vibration at any point must be of sufficient duration to accomplish consolidation but shall not be prolonged to the point where segregation occurs.
4. Vibrators must not be used to level or otherwise relocate concrete.

5. The use of vibrating screeds will not be considered an adequate means of providing consolidation of concrete flatwork, regardless of concrete thickness. Flat work concrete must be consolidated by means of a concrete vibrator.

H. Any relocation or leveling of concrete must be done with shovels or rakes in a manner so as to minimize the potential for segregation.

I. Concrete deposited under water must be carefully placed in a compact mass in its final position by means of a tremie, a closed bottom dump bucket, or other approved method and must not be disrupted after being deposited.

J. A delay, at least until the concrete in columns and walls is no longer plastic, must occur before casting or erecting beams, girders, or slabs supported on them.

K. Beams, girders, brackets, column capitals and haunches will be considered as part of the slab system and must be placed monolithically with the slab.

03.3.05 CONSTRUCTION JOINTS

A. The layout of construction joints must be approved by the Owner's Representative prior to commencement of the concrete work.

B. Where construction joints are shown on the Drawings, they will be included in the work unless noted otherwise.

C. When the placing of concrete is suspended, provisions must be made for joining future work before the placed concrete takes its initial set.

1. For the proper bonding of old and new concrete, provisions must be made for grooves, steps, keys, dovetails, reinforcing bars, or other devices as may be prescribed.

D. The work must be arranged so that a section begun on any day will be finished during daylight of the same day.

E. Before depositing new concrete on or against concrete which has been hardened, the surface of the hardened concrete must be cleaned, and thoroughly coated with a latex bonding agent.

F. Beams, girders, or slabs supported by columns or walls must not be cast or erected until concrete in the vertical support member is no longer plastic.

G. Construction joints in floors must be located near the middle of spans of slabs, beams, or girders, unless a beam intersects a girder at the middle location, in which case joints in the girders must be offset a distance equal to twice the width of the beam.

H. Provisions, subject to the approval of the Owner's Representative, must be made for transfer of shear and other forces through the construction joint.

03.3.06 ISOLATION AND EXPANSION JOINTS

A. Isolation and expansion joints must extend the full depth and should only be constructed to isolate fixed objects abutting or within the paved area.

B. Pre-molded filler must be cut to the same shape as that of the surfaces being joined.

C. Filler must be fixed firmly against the surface of the concrete already in place in such a manner that it will not be displaced when concrete is deposited against it.

03.3.07 CONTRACTION (CONTROL) JOINTS

A. The layout of contraction joints must be approved by the Owner's Representative prior to commencement of the concrete work.

B. Contraction joints must be tooled or sawn at the locations shown on the Drawings, and as directed by the Owner's Representative. Joint spacing must not exceed 30 times the concrete thickness with a maximum spacing of 15 feet.

C. Angles less than 60-degrees must be avoided by offsetting at least 1.5 feet perpendicular to the adjoining joint.

D. The depth of the joints must be at least 1.5 inches but no deeper than within 0.5 inch of the reinforcing steel.

E. Joint width must be as shown on the Drawings and as specified herein to accommodate joint filler material if specified.

1. **Technical Provisions**

a. Reserved.

F. Sawn contraction joints must be installed within 24 hours of termination of the moist cure.

G. Sawing performed during the moist curing period must be conducted in a manner that minimizes the interruption of the moist cure.

03.3.08 TESTING

A. Testing for concrete must be performed in accordance with **SECTION 03 05 00 – COMMON WORK RESULTS FOR CONCRETE** of these Specifications.

B. Slump of the concrete must fall within the following ranges:

Columns, walls, suspended slabs	1 to 4 inches
Footings	1 to 3 inches
Slab on grade	2 to 4 inches
Pavements	1 to 2 inches
Grout	6 inch maximum

03.3.09 CLEANUP

A. As work progresses, the Contractor shall remove debris, excess concrete, and complete to finish grade each portion of the work. Once the work is complete, the Contractor shall clear debris and finish the entire site to smooth, uniform slopes presenting a neat and workmanlike appearance.

B. Cleanup will include the removal and disposal of all unsuitable/excess materials.

C. Concrete waste material must be disposed of at a suitable location designated by the Contractor. The Contractor may furnish a concrete waste disposal container for onsite use at no expense to the Owner. Local, state, and federal regulations for disposal must be upheld.

D. Before final acceptance, cleanup of the site must be completed in accordance with the provisions of **SECTION 01 74 23 – FINAL CLEANING** of these Specifications

03.3.10 DEFECTIVE WORK

A. Any defective work disclosed after the forms have been removed must be immediately removed and replaced.

B. If any dimensions are deficient, or if the surface of the concrete is bulged, uneven, or shows honeycomb, which in the opinion of the Owner's Representative cannot be repaired satisfactorily, the entire section must be removed and replaced at no additional expense to the Owner.

END OF SECTION

PART 1 GENERAL

03.1.01 DESCRIPTION

A. This Specification includes furnishing structural concrete meeting all specified requirements that is composed of Portland cement, aggregates, and water. The Contractor shall furnish Ready-Mixed concrete meeting ASTM C94 unless otherwise specified.

03.1.02 REFERENCES

A. The current publications listed below form a part of this Specification.

B. Standards

ASTM C31	Standard Practice for Making and Curing Concrete Test Specimens in the Field
ASTM C33	Standard Specification for Concrete Aggregates
ASTM C39	Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens
ASTM C94	Standard Specification for Ready-Mixed Concrete
ASTM C136	Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates
ASTM C138	Standard Test Method for Density (Unit Weight), Yield, and Air Content (Gravimetric) of Concrete
ASTM C143	Standard Test Method for Slump of Hydraulic-Cement Concrete
ASTM C144	Standard Specification for Aggregate for Masonry Mortar
ASTM C150	Standard Specification for Portland Cement
ASTM C173	Standard Test Method for Air Content of Freshly Mixed Concrete by the Volumetric Method
ASTM C231	Standard Test Method for Air Content of Freshly Mixed Concrete by the Pressure Method
ASTM C260	Standard Specification for Air-Entraining Admixtures for Concrete
ASTM C494	Standard Specification for Chemical Admixtures for Concrete
ASTM C595	Standard Specification for Blended Hydraulic Cements
ASTM C618	Standard Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use in Concrete
ASTM C989	Standard Specification for Slag Cement for Use in Concrete and Mortars
ASTM C1012	Standard Test Method for Length Change of Hydraulic-Cement Mortars Exposed to a Sulfate Solution
ASTM C1017	Standard Specification for Chemical Admixtures for Use in Producing Flowing Concrete
ASTM C1157	Standard Performance Specification for Hydraulic Cement
ASTM D98	Standard Specification for Calcium Chloride
AASHTO T260	Standard Test for Sampling and Testing for Chloride Ion in Concrete and Concrete Raw Materials
ACI 301	Standard Specifications for Structural Concrete

03.1.03 RELATED WORK SPECIFIED ELSEWHERE

A. The following items of Related Work are specified and included in other sections of these Specifications.

SECTION 01 11 00	**SUMMARY OF WORK**
SECTION 01 22 19	**MEASUREMENT AND PAYMENT**
SECTION 01 33 00	**SUBMITTAL PROCEDURES**
SECTION 03 05 00	**COMMON WORK RESULTS FOR CONCRETE**
SECTION 31 23 23.33	**FLOWABLE FILL**

03.1.04 SUBMITTALS

A. The Contractor shall prepare design mixes for each type and strength of concrete by either laboratory trial batch or field experience methods as specified in ACI 301. If trial batch method is

used, an independent testing facility acceptable to the Engineer must be used for preparing and reporting proposed mix designs. Mix designs for each class of concrete must be submitted to the Owner's Representative in accordance with the requirements of **SECTION 01 33 00 – SUBMITTAL PROCEDURES**.

B. Written reports of each proposed mix for each class of concrete must be submitted at least 15 days prior to start of work. Concrete production must not begin until mixes have been reviewed and approved. Sufficient time must be allowed so that sampling and testing can be completed prior to the beginning of construction.

C. Concrete mix designs must meet the mix proportions specified in ACI 301, Chapter 3. Submittals will include the following:

1. Cement, lbs (kgs) ..... Type and source of supply
2. Coarse aggregate ..... Size and source of supply
3. Fine aggregate ..... Size and source of supply
4. Water, gallons (liters) .....City or well
5. Admixtures, oz/yd3(g/M3) ..... Brand and description*
    a. (*) description as retarder, accelerator, air entraining, etc.

D. Prior to construction, the Contractor shall submit certified analyses of the cement, coarse aggregate, fine aggregate, fly ash, and admixtures.

E. When the brand, type, size, or source of cementitious materials, aggregates, water, ice, or admixtures are requested to be changed, the Contractor shall submit new field data or data from new trial mixtures or furnish evidence that indicates that the change will not adversely affect the relevant properties of the concrete for acceptance before using the concrete

PART 2 PRODUCTS

03.2.01 GENERAL

A. Concrete type and strength requirements must be as specified in the respective Sections of Work within these Specifications.

B. All concrete must be air entrained unless noted otherwise or approved by the Owner's Representative.

C. Materials may be subjected to inspection and tests by the Owner's Representative at any time during the progress of their preparation or use.

D. The source of supply of each of the materials must be approved by the Owner's Representative before delivery or use is started.

E. Representative preliminary samples of the materials must be submitted to an independent laboratory by the Contractor, when required, for examination and testing.

F. The costs of testing and sampling and providing materials will be included in the price bid for related work.

G. In no case will the use of pit-run or naturally mixed aggregates be permitted.

H. All fine and coarse aggregates must be stored separately and kept clean.

I. The mixing of different kinds of aggregates from different sources in one storage pile or alternating batches of different aggregates will not be permitted.

03.2.02 CEMENTITIOUS MATERIAL

A. Cementitious material must consist of Portland cement meeting ASTM C150, with or without the addition of supplementary cementitious materials (SCMs) meeting ASTM C618 or ASTM C989, or blended hydraulic cement meeting ASTM C595 or hydraulic cement meeting ASTM C1157. Unless otherwise specified, cementitious material must meet ASTM C150 Type I or Type II. The

cementitious material used in concrete must be the same brand and type and from the same plant of manufacture as the cementitious material used in the concrete represented by the submitted field test data or used in the trial mixtures.

B. Cement, which has been exposed to damp conditions, must not be used.

03.2.03 SUPPLEMENTAL CEMENTITIOUS MATERIAL (SCM)

A. At the Contractor's option or as shown on the Drawings or specified herein, SCM's may be substituted for cement subject to the following restrictions:

B. Fly Ash:

1. Class C fly ash substitutions must not exceed 15 percent, on a pound for pound basis, by weight of the required Portland cement.

2. Class F fly ash substitutions must either:

   a. Not exceed 10 percent, on a pound for pound basis of the required Portland cement; or

   b. Replace 3 pounds of Portland cement with 4 pounds of fly ash up to a maximum of 15 percent reduction from the required Portland cement weight.

3. Class F fly ash must conform to the standards and specifications of ASTM C618 except as noted below:

   a. The calcium oxide content must be limited to no more than 20 percent by weight.

   b. The fly ash must conform to the standards and specifications of ASTM C1012 for sulfate resistance.

   c. Certified test results showing conformance to these requirements for Class F fly ash must be substituted with the mix designs.

C. Silica Fume: May replace from 5-12% of the cement in the mix.

D. Blast Furnace Slag: may replace from 20-70% of the cement in the mix.

E. Regardless of the amount or class of SCM used, all other requirements of these specifications must be met including strength, air entrainment, and slump.

03.2.04 AGGREGATES

A. During the construction period the Contractor shall, at all times, make available to the Owner's Representative samples of aggregate.

03.2.05 FINE AGGREGATE

A. Except as noted herein, the fine aggregate must conform to the requirements of ASTM C33. Fine aggregate must be natural sands washed clean, consisting of hard, strong, sharp uncoated grains, free of dust, lumps, mica, shale, organic matter, or other deleterious substances.

B. Fine aggregate must be graded within the following limits when tested in conformity with ASTM C136.

FINE AGGREGATE GRADATION REQUIREMENTS

SIEVE SIZE	PERCENT PASSING
3/8''	100
No. 4	95 - 100
No. 8	80 - 100
No. 16	50 - 85
No. 30	25 – 60
No. 50	5 – 30
No. 100	0 – 10
Fineness Modulus	2.3 – 3.1

The fine aggregate must not have more than 45% passing any sieve and retained on the next consecutive sieve of those shown.

C. The testing, sampling, and quality of mortar sand for use in cement mortar must conform to ASTM C144.

03.2.06 COARSE AGGREGATE

A. Except as noted herein, the coarse aggregate used must conform to the requirements of ASTM C33.

B. Coarse aggregate must consist of gravel or broken stone, composed of strong, hard, durable, uncoated pebbles or rock fragments, washed clean, and free from more than 0.7% by weight, amounts of shale, coal, clay, lumps, soft fragments, dirt, glass, organic or any other deleterious substances larger than the No. 4 sieve.

C. Coarse aggregate must be graded from coarse to fine within one of the following limits when tested in conformity with ASTM C136.

D. The coarse aggregate with a nominal maximum aggregate size of 3/8 inch may only be used where specified or approved by the Owner's Representative.

E. Once a gradation is adopted for use, no change in gradation will be made during the course of the work.

COARSE AGGREGATE GRADATIONS

NOMINAL MAXIMUM COARSE AGGREGATE SIZE

	1-1/2"	**1"**	**3/4"**	**3/8"**
SIEVE SIZE	**PERCENT PASSING**			
2"	100			
1 1/2	95-100	100		
1"		95-100	100	
3/4"	35-70		90-100	
1/2"		25-60		100
3/8"	10-30		20-55	85-100
No. 4	0-5	0-10	0-10	10-30
No. 8		0-5	0-5	0-10
No. 16				0-5

F. The nominal maximum aggregate size must not exceed 75% of the spacing between adjacent reinforcing bars nor 75% of the clear cover between concrete surfaces and reinforcing bars.

03.2.07 WATER AND ICE

A. Water used in concrete must be clean and free from injurious amounts of oils, acids, alkalis, salts, organic materials, or other substances that may be deleterious to concrete or reinforcement.

B. Water must be subject to test and approval as required by the Owner's Representative.

C. The cost of testing and sampling will be included in price bid for related work.

03.2.08 ADMIXTURES

A. Substances other than cement, water, aggregates, and air-entraining agents must not be used in the concrete except as when permitted in writing by the Owner's Representative or unless otherwise required or provided in the Drawings or as specified herein.

B. Submitted admixtures must meet the following requirements:

1. Air entraining, admixtures - ASTM C260
2. Chemical admixtures - ASTM C494

3. Chemical admixtures for use in producing, flowing concrete - ASTM C1017
4. Calcium Chloride - ASTM D98

C. Admixtures used must be the same as those used in the concrete represented by submitted field test data or in trial mixtures.

D. When admixtures are used to control hydration, the Contractor shall submit to the Owner's Representative, manufacturer's recommended dosage guidelines along with estimated increase in working time.

E. No admixture may be used which interferes with proper control of the entrained air content of concrete.

F. Permission to use any admixtures may be withdrawn at any time if the properties of the admixture are not uniform or if satisfactory results are not being obtained.

G. Should the Contractor request and obtain permission to use admixtures for his own benefit, no additional compensation will be allowed for the cost of furnishing the admixtures and incorporating them into the concrete mixture.

03.2.09 MIX DESIGN

A. Mix designs and tests for each concrete mix to be used must be made using aggregates which have been approved.

1. The amounts and proportions of fine and coarse aggregates to be used in each mix must be such as to produce a plastic, workable mix, free from harshness, which can be readily placed into the corners and angles of the forms and around reinforcement and other embedded work without undue accumulation of water on the surface, and such that there will be no honeycombing in the structure.
2. Proportions of fine and coarse aggregates must be such that the ratio of the coarse to the fine aggregate will not be less than one (1) nor more than two (2).
3. Concrete proportions, including the water/cement ratio, may be established on the basis of field experience, laboratory trial batches with materials to be employed, or by water-cement ratio proportioning.
4. Proportioning Based on Field Experience:
   a. Where a concrete production facility has a record based on at least 10 consecutive strength tests accumulated over a period of over 60 days that represent similar materials and conditions to those expected, required average compressive strength used as the basis for selecting concrete proportions must exceed specified compressive strength at twenty-eight (28) days by at least the following strengths:

i.	400 psi	if standard deviation is less than	300	psi
ii.	550 psi	if standard deviation is	300 to 400	psi
iii.	700 psi	if standard deviation is	400 to 500	psi
iv.	900 psi	if standard deviation is	500 to 600	psi

   b. If standard deviation exceeds 600 psi, concrete proportions must be selected to produce an average strength at least 1200 psi greater than the required compressive strength.
   c. Strength test data for the determining standard deviation must be considered to comply with the requirements of this section if the data represent either a group of at least 15 consecutive tests or a statistical average for two groups totaling 30 or more tests. Neither of the two groups may consist of less than 10 tests.
   d. Strength tests used to establish the standard deviation must represent concrete produced to meet a specified strength or strengths within 1000 psi of that specified for the proposed work.

e. Variations in materials quality and proportions within the population of background tests used to establish the standard deviation must not have been more closely restricted than for the purposed work.

f. The Contractor shall furnish the Owner's Representative with two (2) copies of the above-mentioned record of tests together with a calculation of the standard deviation and proposed mix design for approval by the Owner's Representative.

5. Proportioning by Laboratory Trial Batches:

a. When laboratory trial batches are used as the basis for selecting concrete proportions, strength tests must be made in accordance with ASTM C39 on cylinders prepared in accordance ASTM C192.

b. When the laboratory trial batches are made, air content must be within +/- 0.5 percent and slump within +/- 0.75 inches of the maximums permitted by these Specifications.

c. A curve must be established showing the relationship between water/cement ratio (or cement content) and compressive strength.

i. The curve must be based on at least three (3) points representing batches which produce compressive strengths above and below the average compressive strength as required in the above paragraph.

ii. Each point on the curve must represent the average of at least three (3) test cylinders.

d. The maximum permitted water to cement ratio (or minimum cement content) for concrete to be used in the structure must be that shown by the curve to produce concrete with a strength equal to or greater than the average required strength as indicated in this Section.

6. Proportioning by Water-Cementitious Material Ratio:

a. If Suitable recorded test data from field experience or from laboratory trail batches are not available, permission in writing from the Owner's Representative may be granted upon written request from the Contractor to base concrete proportions on the following water – cementitious material ratios for air-entrained concrete:

CLASS CONCRETE	SPECIFIED 28-DAY COMPRESSIVE STRENGTH (PSI)	RATIO BY WEIGHT OF WATER TO CEMENT
(Reserved)	6,000	0.32
(Reserved)	5,000	0.40
(Reserved)	4,000	0.48
(Reserved)	3,000	0.59
(Reserved)	2,000	0.74
CLSM	60	0.60

B. Test of Design Mix: Concrete proportioned under the provisions of this section must be tested before placement on the job.

1. A minimum of six (6) test cylinders must be prepared in accordance with ASTM C192 and tested in accordance ASTM C39 at 28 days at a test facility approved by the Owner's Representative.

2. A report of such test must be prepared and submitted to the Owner's Representative.

3. The approval of the Owner's Representative is required prior to placing the concrete on the job.

4. The cost of these tests will be borne by the Contractor.

C. CLSM (Controlled Low Strength Material)

1. CLSM or flowable fill must be placed at the locations shown on the Drawings in accordance

with the requirements of **SECTION 31 23 23.33 – FLOWABLE FILL** of these Specifications.

03.2.10 AIR ENTRAINMENT

A. All structural concrete must have air entrained by use of an air-entraining admixture. Air content of the air-entrained concrete shall conform to the following:

MAXIMUM NOMINAL AGGREGATE SIZE - INCHES	AIR CONTENT BY VOLUME
1-1/2	4 - 6%
3/4 or 1	5 - 7%
3/8 or 1/2	6-1/2 to 8-1/2%

03.2.11 QUICK-SET HYDRAULIC CEMENT

A. A quick-set hydraulic cement must be used for grouting and sealing around pipes, anchor bolts, or as directed by the Owner's Representative.

B. The compound must instantly stop running water or seepage through concrete or masonry walls and floors.

PART 3 EXECUTION

03.3.01 GENERAL

A. Refer to Related Work sections for applicable construction related activity related to Structural Concrete if not included herein.

03.3.02 TESTING

A. The Contractor shall employ at his expense a testing laboratory acceptable to the Engineer to perform material evaluation tests and/or perform the mix design prior to placing any concrete.

B. Testing for concrete must be performed in accordance with the provisions of **SECTION 03 05 00 – COMMON WORK RESULTS FOR CONCRETE** of these Specifications.

END OF SECTION

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PART 1 GENERAL

03.1.01 DESCRIPTION

A. The work covered under this Specification consists of finishing concrete constructed in accordance with these Specifications and placed at the locations shown on the Drawings.

03.1.02 REFERENCES

A. Reserved.

03.1.03 RELATED WORK SPECIFIED ELSEWHERE

A. The following items of related work are specified and included in other sections of these Specifications:

SECTION 01 11 00 SUMMARY OF WORK
SECTION 01 22 19 MEASUREMENT AND PAYMENT
SECTION 01 33 00 SUBMITTAL PROCEDURES
SECTION 03 05 00 COMMON WORK RESULTS FOR CONCRETE
SECTION 03 30 00 CAST-IN-PLACE CONCRETE

03.1.04 SUBMITTALS

A. The Contractor must submit shop drawings and product data in accordance with **SECTION 01 33 00 – SUBMITTAL PROCEDURES** for concrete finishing products.

PART 2 PRODUCTS

03.2.01 CONCRETE SURFACE FINISHER

A. All concrete surfaces that are exposed to view except the top surface of floors, curb and gutter, and slabs on grade must be finished with a concrete surface finisher composed of cementitious material with a latex or acrylic based bonding agent as shown on the Drawings or scheduled herein.

B. **Technical Provisions**

1. Reserved.

2. Concrete surface finisher must be "Thoroseal Plaster Mix" as manufactured by Thoro System Products, Inc., or "Concrete Finisher" as manufactured by Tamms Industries Company, or equal.

PART 3 EXECUTION

03.3.01 GENERAL

A. The Contractor shall furnish all labor, materials, and services necessary for the completion of all work as shown on the Drawings and specified herein. All work will be subject to the review of the Owner's Representative.

03.3.02 SURFACE FINISH

A. All exposed concrete surfaces must be true, smooth, free from open or rough spaces, depressions, or projections.

B. All exposed concrete must be float finished on all surfaces unless otherwise shown on the Drawings.

C. Within 24 hours after form removal, all fins and irregular projections must be removed from all concrete surfaces.

D. All form ties must be removed without causing spalling or damage to the concrete.

E. Concrete surfaces, which are to be exposed, waterproofed, damp proofed, painted, or coated with concrete surface finishes must be finished as follows:

1. Cavities resulting from form tie removal, sand pockets, honeycombing and all other holes greater than 1/2-inch in any direction must be cleaned, saturated with water, and completely filled with mortar consisting of one-part cement and two parts fine sand.

2. All depressions and voids must be filled so as to allow painting or coating with damp proofing compounds to be applied without undue difficulty in covering or filling remaining voids.

F. Concrete Surface Finisher as specified herein must be applied to surfaces as scheduled herein or as shown on the Drawings.

G. Tolerances for floors will be:

1. 1/8" above or below the line in 10'-0".

2. 1/16" above or below the line in 5'-0".

3. 1/32" above or below the line in 2'-0".

03.3.03 MATERIALS STORAGE

A. All materials must be stored and handled in a manner ensure the preservation of their quality and fitness for use and which protects them from dampness, damage, and freezing.

03.3.04 CURING AND PROTECTION

A. The Contractor shall be responsible for verifying that curing compounds and methods are compatible with the concrete surface finisher and floor finishes.

03.3.05 DEFECTIVE WORK

A. Any concrete that is not finished as specified herein must be immediately removed and replaced at no additional cost to the Owner.

SCHEDULE 03 35 00

CONCRETE FINISHES

DESCRIPTION/LOCATION	SURFACE FINISH
Manhole walls, floor and cover	Concrete Surface Finisher

END OF SECTION

PART 1 GENERAL

03.1.01 DESCRIPTION

A. The work covered under this Specification consists of protecting and curing concrete constructed in accordance with these Specifications and placed at the locations shown on the Drawings.

03.1.02 REFERENCES

A. The current publications listed below form a part of this Specification.

B. Standards

ASTM C140	Standard Test Methods for Sampling and Testing Concrete Masonry Units and Related Units
ASTM C309	Standard Specification for Liquid Membrane-Forming Compounds for Curing Concrete
ASTM C642	Standard Test Method for Density, Absorption, and Voids in Hardened Concrete

03.1.03 RELATED WORK SPECIFIED ELSEWHERE

A. The following items of related work are specified and included in other sections of these Specifications:

SECTION 01 11 00 SUMMARY OF WORK
SECTION 01 22 19 MEASUREMENT AND PAYMENT
SECTION 01 33 00 SUBMITTAL PROCEDURES
SECTION 03 05 00 COMMON WORK RESULTS FOR CONCRETE
SECTION 03 30 00 CAST-IN-PLACE CONCRETE

03.1.04 SUBMITTALS

A. The Contractor must submit shop drawings and product data in accordance with **SECTION 01 33 00 – SUBMITTAL PROCEDURES** for concrete curing products.

PART 2 PRODUCTS

03.2.01 LIQUID MEMBRANE-FORMING COMPOUNDS FOR CURING CONCRETE

A. The Contractor shall furnish liquid membrane-forming compound meeting the requirements of ASTM C309, Type 1 or Type 2.

B. The curing compound must be free from permanent color that would change the color of the natural concrete. The concrete surface must maintain its natural color after curing.

03.2.02 EMULSIFIED LINSEED OIL COMPOUND

A. All requirements of ASTM C309 must be met. The compound must contain at least 2.7 pounds of linseed oil per gallon. A manufacturer's certification showing that the formulated weight of linseed oil per gallon equals or exceeds this limit must be furnished to the Engineer.

PART 3 EXECUTION

03.3.01 GENERAL

A. The Contractor shall furnish all labor, materials, and services necessary for the completion of all work as shown on the Drawings and specified herein. All work will be subject to the review of the Owner's Representative.

B. The Contractor shall thoroughly cure concrete surfaces subject to premature drying by covering as soon as possible with canvas, plastic sheets with sealed joints, burlap and sand, or other satisfactory materials and keep concrete moist. If the concrete surfaces are not covered, they must be kept moist by flushing or sprinkling. Curing must continue for at least 7 days after placing the

concrete. Concrete surfaces placed against forms may be cured by leaving the forms in place for at least 7 days, when approved.

C. Concrete must be protected against freezing or other conditions detrimental to strength development meeting the applicable requirements of this Specification.

D. To aid finishing, side forms on ornamental work, curbs, and sidewalks, railing and parapets may be removed after 12 hours, not to exceed 48 hours, depending on weather conditions. Moist curing must continue during the concrete finishing operation.

E. Untreated forms and existing concrete must be kept continuously wet for at least 1 hour before any concrete is placed and kept wet until covered with concrete. Adequately treated forms must be thoroughly washed with a water spray immediately before placing the concrete.

F. The work must be protected from natural elements, flowing water and from defacement of any type.

G. The curing of concrete, by either water curing or membrane curing, must be as included herein unless otherwise approved by the Engineer.

03.3.02 MATERIALS STORAGE

A. All materials must be stored and handled in a manner to ensure the preservation of their quality and fitness for use and which protects them from dampness, damage, and freezing.

03.3.03 WATER CURING

A. The Contractor shall keep all concrete top surfaces continuously moist after finishing, with a fine water spray, until the concrete has set. The moist concrete must be covered with water or an approved curing covering.

B. Concrete deck slabs and concrete floors must be cured for at least 7 days. Cure may be achieved by placing burlap, cotton mats or other absorptive material as close behind the finishing operation as possible without marring the finished surface. The absorptive material must be kept continuously moist for the full time it is used. The absorptive material may be kept in place for the entire curing period, or it may be removed as soon as practical and the entire surface covered with approximately 1-1/2 inches of sand, kept continuously moist for the entire curing period.

C. When it becomes necessary to remove forms and repair surface irregularities, it must be accomplished without interfering with any of the curing requirements. As soon as the vertical forms have been removed and the surface irregularities repaired, the concrete with absorptive material must be covered and kept continuously wet for the balance of the curing a period.

03.3.04 IMPERVIOUS MEMBRANE CURING

A. The Contractor shall assure membrane curing compounds are delivered to the job in the manufacturer's original container, clearly labeled to show the name of the manufacturer and the contents.

B. The compound must be ready for use as shipped by the manufacturer. Dilution must be as per the manufacturer's recommendations. Sampling will not be required if manufacturer's certification is available. Curing compound must be applied under pressure with a spray nozzle to cover the entire exposed surface thoroughly and completely with a uniform film not exceeding manufacturer's specifications. The required pressure in the spray machine must be maintained to force the material to leave the nozzle in a fine mist. All concrete surfaces must be kept moist with a fine water spray or with wetted burlap until the sealing compound is applied. The curing compound application must be kept close to the finishers of the top surface of concrete at all times. The concrete must be sealed immediately after the finishing operations have been completed, to the satisfaction of the Engineer.

C. If it is necessary to allow workers or equipment on the surface before the 7-day curing period is completed, the top surface of sealed concrete must be covered with a protective cushion for runways. A cushion must be used consisting of a moist, 1-inch minimum thick layer of fine sand, or layers of moist burlap that will prevent damage to the finished concrete. The approved cushion must be covered with four-foot by eight-foot sheets of 3/4-inch plywood laid over the cushion. The

cushion material must not be placed for at least 8 hours after the final application of the curing compound. The Engineer's written approval must be obtained for any other proposed cushion material before use. Layers of plastic, visqueen, or canvas are not acceptable cushion materials.

D. Concrete, which has not completed its curing period, must be kept continuously moist during the stripping and surface repair operations. All surface irregularities must be removed and all depressions, voids, or holes, including those formed by trapped air must be repaired to the satisfaction of the Engineer. The curing compound must be applied immediately before the surface has had an opportunity to dry out. Concrete, from which forms have been stripped, must be kept continuously moist until surface repair and finishing are completed, and the impervious membrane curing has been applied.

03.3.05 DEFECTIVE WORK

A. Any concrete that is not cured and protected as specified herein must be immediately removed and replaced at no additional cost to the Owner.

END OF SECTION

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PART 1 GENERAL

03.1.01 DESCRIPTION

A. This Specification covers precast, conventionally reinforced, or prestressed structural concrete construction, including product design not shown on contract Drawings, manufacturing, transportation, erection, and other related items such as anchorage, bearing pads, storage, and protection of precast concrete.

03.1.02 REFERENCES

A. The current publications listed below form a part of this Specification.

B. Standards

ASTM A36	Standard Specification for Carbon Structural Steel
ASTM A153	Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware
ASTM A416	Standard Specification for Low-Relaxation, Seven-Wire Steel Strand for Prestressed Concrete
ASTM A615	Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement
ASTM A666	Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Plate, and Flat Bar
ASTM A706	Standard Specification for Deformed and Plain Low-Alloy Steel Bars for Concrete Reinforcement
ASTM A1064	Standard Specification for Carbon-Steel Wire and Welded Wire Reinforcement, Plain and Deformed, for Concrete
ASTM C33	Standard Specification for Concrete Aggregates
ASTM C150	Standard Specification for Portland Cement
ASTM C260	Standard Specification for Air-Entrained Admixtures for Concrete
ASTM C333	Standard Specification for Lightweight Aggregates for Structural Concrete
ASTM C494	Standard Specification for Chemical Admixtures for Concrete
AASHTO	American Association of State Highway and Transportation Officials
ACI	American Concrete Institute
AWS	American Welding Society
MIL	Military Specifications
PCI	Precast Concrete Institute

03.1.03 QUALITY ASSURANCE

A. Manufacturer qualifications: The precast concrete manufacturing plant must be certified by the Prestressed Concrete Institute, Plant Certification Program, prior to the start of production.

B. Erector qualifications: Erectors shall be regularly engaged for at least 5 years in the erection of the precast structural concrete similar to the requirements of this project.

C. Welder qualifications: In accordance with AWS D1.1.

D. Testing: In general, compliance with testing provisions in PCI MNL-116, Manual for Quality Control for Plants and Production of Precast and Prestressed Concrete Products is required.

E. Requirements of regulatory agencies: All local codes plus the following specifications, standards and codes are a part of these Specifications:

1. ACI 318 - Building Code Requirements for Reinforced Concrete.
2. AWS D1.1 - Structural Welding Code - Steel.
3. AWS D1.4 - Structural Welding Code - Reinforced Steel.
4. ASTM Specifications - As referred to in these Specifications.

F. Attestation:

1. When requested by the Engineer, written evidence must be submitted to show experience qualifications and adequacy of plant capability and facilities for performance of Contract requirements.

03.1.04 RELATED WORK SPECIFIED ELSEWHERE

A. The following items of related work are specified and included in other sections of these Specifications:

SECTION 01 11 00 SUMMARY OF WORK
SECTION 01 22 19 MEASUREMENT AND PAYMENT
SECTION 01 33 00 SUBMITTAL PROCEDURES
SECTION 03 05 00 COMMON WORK RESULTS FOR CONCRETE

03.1.05 SUBMITTALS

A. The Contractor must submit manufacturer's product data for the following items. Information shall be submitted as per **SECTION 01 33 00 – SUBMITTAL PROCEDURES** for review and acceptance prior to fabrication.

1. Erection drawings.
   a. Plans and elevations locating and defining all material furnished by manufacturer.
   b. Sections and details showing connections, cast-in items and their relationship to the structure.
   c. Description of all loose, cast-in and field hardware.
   d. Field installed anchor location drawings.
   e. Erection sequences and handling requirements.
   f. All dead, live, and other applicable loads used in the design.
2. Production drawings
   a. Elevation view of each member.
   b. Sections and details to indicate quantities and position of reinforcing steel, anchors, inserts, etc.
   c. Lifting and erection inserts.
   d. Dimensions and finishes.
   e. Prestress for strand and concrete strengths.
   f. Estimated cambers.
   g. Method of transportation.
3. Loadings for design, calculations and deviations
   a. Initial handling and erection stresses.
   b. All dead and live loads as specified on the contract drawings.
   c. All other loads specified for member, where applicable.
   d. Design calculations of products not completed on the contract drawings must be performed by a registered Engineer experienced in precast, prestressed concrete design. Submittals must bear the Engineer's certification for the state in which the precast, prestressed products are erected.
   e. Design deviations will be permitted only after the Engineer's written approval of the manufacturer's proposed design supported by complete design calculations and drawings.

f. Design deviations must provide an installation equivalent to the basic intent without incurring additional cost to the Owner.

PART 2 PRODUCTS

03.2.01 MATERIAL

A. Portland cement:
   1. ASTM C150 - Type I or II

B. Admixtures:
   1. Air-entraining admixtures: ASTM C260
   2. Water reducing, retarding, accelerating, high range water reducing admixture: ASTM C494

C. Aggregates:
   1. ASTM C33 or C330

D. Water:
   1. Potable or free from foreign materials in amounts harmful to concrete and embedded steel

E. Reinforcing Steel:
   1. Bars:
      a. Deformed billet-steel: ASTM A615
      b. Deformed low-alloy steel: ASTM A706 (when bars are welded)
   2. Wire:
      a. Cold-drawn steel: ASTM A1064
   3. Wire fabric:
      a. Welded steel: ASTM A1064
      b. Welded deformed steel: ASTM A1064

F. Strand:
   1. Uncoated, 7-wire, stress-relieved strand: ASTM A416 (including supplement) - Grade 250K or 270K

G. Anchors and Inserts:
   1. Material:
      a. Structural steel: ASTM A36
      b. Malleable iron
      c. Stainless steel: ASTM A666
   2. Finish:
      a. Shop primer: Manufacturer's standards
      b. Hot dipped galvanized: ASTM A153
      c. Zinc-rich coating: MIL-P-21035, self-curing, one component, sacrificial
      d. Cadmium coating

H. Grout:
   1. Cement grout: Portland cement, sand, and water sufficient for placement and hydration
   2. Non-shrink grout: Premixed, packaged ferrous and non-ferrous aggregate shrink-resistant grout

3. Epoxy-resin grout: Pre proportioned three component epoxy grout as manufactured by SIKA Corporation or equivalent

I. Bearing Pads:

1. Chloroprene (neoprene): Conform to Division II, Section 25 of AASHTO Standard Specifications for Highway Bridges.

2. Random oriented fiber reinforced: Must support a compressive stress of 3000 psi with no cracking, splitting, of delaminating in the internal portions of the pad. One specimen must be tested for each 200 pads used in the project.

3. Duck layer reinforced pad: Conform to Division II, Section 10.3.12 of AASHTO Standard Specifications for Highway Bridges or Military Specification MIL-C-882C.

4. Plastic: Multi-monomer plastic strips must be non-leaching and support construction loads with no visible overall expansion.

5. Tetraflouroethylene (TFE) reinforced with glass fibers and applied to stainless or structural steel plates.

J. Welded Studs:

1. AWS D1.1

K. Rigid Panel Insulation:

1. Insulation when specifically called for to be used in precast/prestressed wall panels, must be polyisocyanurate foam providing no less than a minimum R value of 14.3 per 2" thickness.

L. Cast-In-Place Wood:

1. All wood members specifically called for to be cast-in-place at openings and panel ends and where detailed on the drawings must consist of pressure treated, construction grade lumber firmly anchored to resist pull-out.

03.2.02 CONCRETE MIXES

A. 28-day compressive strength: Minimum of 5000 psi

B. Release strength: Minimum of 3500 psi, for wet cast products; or 4500 psi minimum for dry cast products

C. Use of calcium chloride, chloride ions or other salts is not permitted.

PART 3 EXECUTION

03.3.01 MANUFACTURE

A. Manufacturing procedures must be in general compliance with PCI MNL-116.

B. Manufacturing tolerances must comply with PCI MNL-116.

C. Finishes:

1. Standard form side surfaces: Resulting from casting against approved forms using good industry practice in cleaning of forms, design of concrete mix, placing and curing. Small surface holes caused by air bubbles, normal form joint marks, and minor chips and spalls will be tolerated, but no major or unsightly imperfections, honeycomb, or other defects will be permitted. All air pockets and holes over 1/4-inch in diameter must be filled with sand-cement paste and rubbed flush.

2. Standard unformed side surfaces: Result of vibrating screed and additional hand finishing at projections. Normal color variations, minor identifications, minor chips and spalls will be permitted. No major imperfections, honeycomb, or defects will be permitted. The surface must first be floated and then be lightly broomed.

3. Exposed vertical ends: Strands must be recessed and the ends of the member shall receive sacked finish. All form offsets or fins over 1/8-inch must be ground smooth.

D. Special finish: Only if specifically called for on the Plans or specified herein.

E. Openings:

1. Primarily on thin sections, the manufacturer shall provide for those openings 10 inches or larger, round or square as shown on the structural drawings. Other openings must be located and field core drilled or saw cut by the trade requiring them after the precast, prestressed products have been erected. Openings must be approved by the Engineer before drilling or cutting. No openings may be created by jack hammering or hammer drills.

F. Patching:

1. All patching (patchwork) must be performed by the precast manufacturer and will be acceptable providing the structural adequacy of the product and the appearance are not impaired.

G. Fasteners:

1. Aside from the manufacturer's standard erection plates, the manufacturer shall also cast in all other structural inserts, bolts and plates as detailed or required by the contract drawings.

H. Paint:

1. If applicable, paint and primers must conform to the requirements of **SECTION 09 91 00 – PAINTING** of these Specifications.

03.3.02 PRODUCT DELIVERY, HANDLING AND STORAGE

A. Delivery and handling:

1. Precast concrete members must be lifted and supported during manufacturing, stockpiling, transporting, and erection operations only at the lifting or supporting point, or both, as shown on the shop drawings, and with approved lifting devices. Lifting inserts must have a minimum safety factor of 5.

2. Transportation, site handling, and erection must be performed with acceptable equipment and methods, and by qualified personnel.

B. Storage:

1. All units must be stored off ground.

2. Stored units must be placed so that identification marks are discernable.

3. Stacked members must be separated by battens across full widths of each bearing point.

4. Stacked members must be stacked so that lifting devices are accessible and undamaged.

5. The upper member of stacked tier must not be used as storage area for shorter member or heavy equipment.

03.3.03 ERECTION

A. Site Access:

1. Contractor shall be responsible for providing suitable access to the points of erection, proper drainage, and firm, level bearing for the hauling and erection equipment to operate under their own power.

B. Erection Tolerances and Alignment:

1. Precast/prestressed concrete products erected in place must be within the following erection tolerances:

a. Variation from level, flatness or slopes shown: Soffits, horizontal joints and conspicuous other lines: 1/4-inch in any bay or 20 feet max. 1/2-inch in 40 feet or more (non-cumulative).

b. Variations of linear building lines from established position in plan and their position (non-cumulative) related to columns: 1/4-inch in any bay or 20 feet maximum. 1/2-inch in 40 feet or more.

c. Variation of anchors and fasteners from established position in plan and their position related to columns: 1/4-inch.

d. Maximum differential between adjacent units in erected position: 1/4-inch.

2. Alignment must follow PCI allowable tolerances according to the PCI manual. Variations in excess of PCI tolerances between adjacent members must be reasonably leveled.

C. Preparation:

1. General Contractor shall be responsible for:

a. Providing true, level bearing surfaces on all field placed bearing walls and other field placed supporting members.

b. Placement and accurate alignment of anchor bolt, plates or dowels in column footings, grade beams and other field placed supporting members.

c. All shoring required for composite beams and slabs. Shoring must have a minimum load factor of 1.5 X (dead load plus construction load).

D. Installation:

1. Installation of precast, prestressed concrete must be performed by the manufacturer or a qualified erector. Members must be lifted by means of suitable lifting devices at points provided by the manufacturer. Temporary shoring and bracing, if necessary, must comply with manufacturer's recommendations.

E. Setting and Anchorage:

1. Setting of prestressed concrete units must meet requirements of ACI 525 for erection.

2. Metal anchors, inserts, clip angles, anchor plates, shims, bolts, wedge head bolts and other devices and fastening accessories must be provided as necessary for erection of prestressed concrete units complete in place. During erection, units must be secured to structural elements as detailed. Install clips, plates, straps, bolts, and nuts for attachment of cast units. Nuts must have one flat and one lock washer. Stainless steel bolts and anchors must be used where sulfide resistance is necessary.

03.3.04 FIELD WELDING

A. Field welding is to be done by qualified welders using equipment and materials compatible to the base material.

03.3.05 ATTACHMENTS

A. Subject to approval of the Engineer, precast, prestressed products may be drilled or "shot" provided no contact is made with the prestressing steel. Should spalling occur, it must be repaired by the trade doing the drilling or the shooting.

03.3.06 DAMAGED WORK AND ACCEPTANCE

A. Damage: Any unit which exhibits damage to surfaces, finish, corners, or edges which will be exposed to view after setting in-place, or which are broken or cracked due to shrinkage, temperature, transportation, handling, or erection must be replaced; except that in specific instances approved in writing by the Engineer, work may be repaired in-place. In-place repairs must be made by the precast manufacturer.

B. Acceptance: Acceptance of repaired work, which has been repaired pursuant to such written approval, will be contingent upon the repairs being acceptably done so as to be sound, permanent, flush with adjacent surfaces and of color and texture matching similar adjoining surfaces and showing no apparent line of demarcation between original and repaired work. Other work affected by removal of defective cast members must be removed and replaced.

03.3.07 PAINTING

A. All structural steel hangers and embedded items exposed to view or otherwise not protected from the environment must be shop primed in accordance with **SECTION 09 91 00 – PAINTING** of these Specifications. Stainless steel hardware need not be painted.

END OF SECTION

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PART 1 GENERAL

03.1.01 DESCRIPTION

A. This Specification covers cementitious grouts and all appurtenances thereto required for the placement of grouts as shown on the Drawings and specified herein.

03.1.02 REFERENCES

A. The current publications listed below form a part of this Specification.

B. Standards

ASTM C109	Standard Test Method for Compressive Strength of Hydraulic Cement Mortars
ASTM C191	Standard Test Methods for Time of Setting of Hydraulic Cement by Vicat Needle
ASTM C287	Standard Specifications for Chemical-Resistant Sulfur Mortar
ASTM C1107	Standard Specification for Packaged Dry, Hydraulic-Cement Grout

03.1.03 RELATED WORK SPECIFIED ELSEWHERE

A. The following items of related work are specified and included in other sections of these Specifications:

SECTION 01 11 00	**SUMMARY OF WORK**
SECTION 01 22 19	**MEASUREMENT AND PAYMENT**
SECTION 01 33 00	**SUBMITTAL PROCEDURES**
SECTION 03 05 00	**COMMON WORK RESULTS FOR CONCRETE**
SECTION 03 30 00	**CAST IN PLACE CONCRETE**

03.1.04 SUBMITTALS

A. The Contractor must submit the following in accordance with **SECTION 01 33 00 – SUBMITTAL PROCEDURES**.

1. Mix designs for concrete grout.
2. Product Data for non-shrink, non-metallic grout.

PART 2 PRODUCTS

03.2.01 GENERAL

A. All grout mixes must conform to ASTM C287, C191 and C109 for non-shrink performance, workability and strength, respectively.

03.2.02 CONCRETE GROUT

A. Portland Cement: as specified in **SECTION 03 31 00 – STRUCTURAL CONCRETE**.

B. Fine Aggregate: as specified in **SECTION 03 31 00 – STRUCTURAL CONCRETE**.

C. Coarse Aggregate: as specified in **SECTION 03 31 00 – STRUCTURAL CONCRETE**.

D. Water: as specified in **SECTION 03 31 00 – STRUCTURAL CONCRETE**.

03.2.03 NON-SHRINK, NON-METALLIC GROUT

A. Non-shrink, non-metallic grout must conform to the requirements of:

1. Corps of Engineers CRD-C-621.
2. ASTM C1107.

B. **Technical Provisions**

1. Reserved.
2. Non-shrink, non-metallic grouts must be 588 Precision Grout by Sealtight, Sonogrout 10K by Sonneborn, or prior approved equal.

03.2.04 NON-SHRINK, METALLIC GROUT

A. Non-shrink, metallic grout must be used where necessary to support dynamic loads and precision load bearing support.

B. Non-shrink, metallic grout must conform to the requirements of:

1. Corps of Engineers CRD-C-621.
2. ASTM C1107.

C. **Technical Provisions**

1. Reserved.
2. Non-shrink, metallic grouts must be Embers 636 Plus Grout by Sonneborn, Embers 885 by Sonneborn, or 100 Non-Shrink Metallic Grout by Conspec or prior approved equal.

03.2.05 BOND COAT

A. Bond coat must consist of one-part Portland Cement and one-part fine aggregate, by weight thoroughly mixed with sufficient water to produce a grout of brushable consistency.

PART 3 EXECUTION

03.3.01 MIXING

A. The grout must be thoroughly mixed either by hand, turning the entire dry mix over sufficient times to insure even distribution of its components; or mixed in a mechanical type mixer for not less than 3 minutes.

03.3.02 PLACEMENT

A. Preparation: Where equipment supports require grouting, the equipment must be placed and aligned and/or leveled on shims and the bolts drawn tight.

1. Supports to be grouted must be at the temperature of the room and/or atmosphere when the grout is placed.
2. The space to be occupied by the grout must be thoroughly cleaned, removing all dirt, oil, grease, and loose material.
3. The contact concrete surface must be saturated with water, but no free water shall remain on the surfaces when the grout is placed.

B. Bond Coat: Immediately prior to placing the grout, the bond coat must be brushed onto the saturated surface of the concrete and scrubbed into that surface throughout the contact area or for a distance as far back under the bedplate of the equipment as is practicable.

1. The grout must be placed before the bonding coat has dried or taken an initial set.

C. Grouting

1. The grout will be placed by whatever means is most practicable, depending on the equipment to be grouted in.
    a. The grout may be dry packed by ramming, pressure grouted by gravity, by pneumatic pressure, or by pumping, or poured in place.
2. Whatever means for placing the grout is employed, the grout must be thoroughly compacted and all air pockets removed.
3. Whenever practicable, grout must be poured from one end or side only to avoid excessive air entrapment.

END OF SECTION

PART 1 GENERAL

31.1.01 DESCRIPTION

A. This Specification includes work common to earthwork, grading, excavation and fill and all appurtenances thereto as shown on the Drawings and specified herein.

31.1.02 REFERENCES

A. The current publications listed below form a part of this Specification.

B. Standards

AASHTO T99	Standard Test Method for Moisture-Density Relations of Soils and Soil-Aggregate Mixtures Using 5-lb (2.5kg) Rammer and 12-inch (305mm) Drop
ASTM D698	Standard Test Method for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft ^{3} or 600 kN-m/m ^{3})
ASTM D1556	Standard Test Method for Density and Unit Weight of Soil In-Place by the Sand-Cone Method
ASTM D4318	Standard Test Methods for Liquid Limit, Plastic Limit, and Plasticity Index of Soils
ASTM D6938	Standard Test Method for In-Place density and Water Content of Soil and Soil-Aggregate by Nuclear Methods (Shallow Depth)

31.1.03 RELATED WORK SPECIFIED ELSEWHERE

A. The following items of related work are specified and included in other Sections of these Specifications:

SECTION 01 11 00	**SUMMARY OF WORK**
SECTION 01 22 19	**MEASUREMENT AND PAYMENT**
SECTION 01 33 00	**SUBMITTAL PROCEDURES**
SECTION 01 45 00	**QUALITY CONTROL**
SECTION 31 05 00	**SOIL STRIPPING AND STOCKPILING**
SECTION 31 22 19	**FINISH GRADING**
SECTION 31 23 00	**EXCAVATION AND FILL**
SECTION 31 23 13	**SUBGRADE PREPARATION**
SECTION 31 23 19	**DEWATERING**
SECTION 31 23 23.23	**FLOWABLE FILL**
SECTION 31 23 33	**TRENCHING AND BACKFILLING**
SECTION 31 23 36	**STRUCTURAL EXCAVATION AND FILL**
SECTION 31 25 00	**EROSION AND SEDIMENT CONTROLS**
SECTION 31 50 00	**EXCAVATION SUPPORT AND PROTECTION**
SECTION 32 05 00	**COMMON WORK RESULTS FOR EXTERIOR IMPROVEMENTS**
SECTION 33 05 00	**COMMON WORK RESULTS FOR UTILITIES**

31.1.04 SUBMITTALS

A. Refer to Related Work sections for applicable submittals required in these Contract Documents if not included herein.

PART 2 PRODUCTS

31.2.01 TYPE 1 BEDDING

A. Bedding shall be as specified by prior approved Pipe Manufacturer's Requirements to top of pipe.

31.2.02 ON-SITE EMBANKMENT

A. Fill and backfill materials are to consist of natural soils free from organic matter, frozen material, refuse, construction debris, or other man-made items. The Contractor shall obtain approval of the Engineer for all fill before placing and use only the fill from designated borrow areas.

31.2.03 STRUCTURAL BACKFILL

A. Structural backfill shall be in accordance with **SECTION 31 23 36 – STRUCTURAL EXCAVATION AND FILL** included within these Specifications.

PART 3 EXECUTION

31.3.01 GENERAL

A. These general construction requirements apply to all site grading, structure excavation, utility excavation and earthwork.

B. Until expiration of the guarantee period, the Contractor shall assume full responsibility and expense for all backfill settlement and shall refill and restore the work as directed to maintain an acceptable surface condition, regardless of location.

31.3.02 REMOVALS

A. The removal of surface improvements (pavement, curb and gutter, walks) shall be held to a minimum, and shall be in accordance with **SECTION 32 05 05 – SELECTIVE DEMOLITION FOR EXTERIOR IMPROVEMENTS** of these Specifications. All materials to be removed and means of replacement shall be subject to the approval of the Owner's Representative where said removals are not detailed on the Drawings.

1. Any surface or sub-surface objects not designated for removal including irrigation systems, landscaping, and structures that are damaged or destroyed shall be replaced by the Contractor.

31.3.03 LIMITS OF CONSTRUCTION

A. The Contractor shall limit the operation of their equipment to those areas shown on the Drawings or as directed by the Owner's Representative to be construction areas.

B. The indiscriminate operation of equipment outside of designated construction areas will not be permitted.

31.3.04 CONTINUITY OF EXISTING TRAFFIC

A. The Contractor shall not interrupt or change existing traffic, delivery, or parking without prior written approval from the Owner's Representative. When interruption is required, coordinate schedule with the Owner agency to minimize disruptions. When working in public right-of-way, obtain all necessary approvals and permits from applicable agency.

B. When Contractor's activities impede or obstruct traffic flow, Contractor shall provide traffic control devices, signs, and flaggers in accordance with other Contract Documents and the current version of the MUTCD, or as shown on the Drawings. A Traffic Control Plan shall be submitted in accordance with **SECTION 01 33 00 – SUBMITTAL PROCEDURES**, and **SECTION 01 55 26 – TRAFFIC CONTROL**.

31.3.05 PROTECTION AND CONTINUITY OF EXISTING UTILITIES

A. The Contractor shall protect and maintain continuity of existing utilities per **SECTION 01 31 00 – PROJECT MANAGEMENT AND COORDINATION** and **SECTION 01 71 00 – EXAMINATION AND PREPARATION** of these Specifications.

B. The Contractor shall verify the locations of any water, drainage, gas, sewer, electric, telephone/communication, fuel, steam lines or other utilities and site features which may be encountered in any excavations or other sitework. All lines shall be properly underpinned and supported in a manner approved by the utility owner to avoid disruption of service.

C. The Contractor shall not interrupt or change existing utilities without prior written approval from the Owner's Representative, affected utilities, and users. Notify all users impacted by outages a minimum of 48 hours in advance of outage. Notification shall be provided in writing and describe the nature and duration of outages and provide the name and number of Contractor's foreman or other contact.

D. Any service connections encountered which are to be removed shall be cut off at the limits of the excavation and capped in accordance with the requirements of applicable codes and any specifications governing such removals.

31.3.06 DUST CONTROL

A. The Contractor shall be responsible for dust control in accordance with **SECTION 01 35 43 – ENVIRONMENTAL PROCEDURES** of these Specifications.

31.3.07 STORMWATER/EXCAVATION WATER MANAGEMENT

A. The Contractor shall be responsible for control measures to prevent damage from flooding, erosion, and sedimentation to on-site and off-site areas, and follow all requirements described in **SECTION 31 25 00 – EROSION AND SEDIMENTATION CONTROLS** of these Specifications.

B. The Contractor shall control grading around structures, pitch ground to prevent water running into excavated areas. Pits, trenches within building lines, and other excavations shall be maintained free of water. Contractor shall provide trenching, pumping, and other facilities required.

C. The Contractor shall notify Engineer if springs or running water are encountered in excavation and provide discharge by trenches, drains, or pumping to a point outside of excavation. The Contractor shall provide information to Engineer of points and areas that water will be discharged and method of discharge.

31.3.08 BLASTING

A. It is not anticipated that blasting will be required for the Project. Should the Contractor exhaust conventional equipment and methods for rock excavation and removal and desire to use explosives to accomplish this Work, the Contractor shall comply with the following:

1. The Owner's Representative shall be notified of any need for blasting to remove materials which cannot be broken up mechanically, and there shall be no blasting operations conducted until the Owner's Representative has been properly notified.

2. Blasting will be allowed only when proper precautions are taken to protect life and property, and then shall be restricted as the Owner's Representative directs.

3. The Contractor shall assume full responsibility for any damages caused by blasting, regardless of the requirements for notification and approval.

4. The Contractor shall secure any required permits for blasting and shall conduct blasting operations in conformance with all applicable federal, state, and local laws, regulations, and ordinances.

31.3.09 SURPLUS MATERIAL AND BORROW

A. The Contractor shall inform and satisfy themselves as to the character, quantity, and distribution of material to be excavated.

B. Material in excess of that required for permanent work and/or materials deemed by the Owner's Representative to be unsuitable for use, with the exception of topsoil, shall be disposed of off-site at a location provided by the Contractor unless a disposal site is noted on the Drawings.

C. Borrow material, if required, shall be provided by the Contractor at no additional expense to the Owner.

1. The Contractor shall notify the Owner's Representative sufficiently in advance of opening any borrow areas so that the borrow material can be tested by the Contractor's Quality Control laboratory before being used.

2. Sufficient time for testing the borrow material shall be allowed.

D. Borrow sites shall be obtained by the Contractor unless an Owner-provided borrow site is shown on the Drawings.

E. Borrow sites and excess soil disposal sites, where shown on the Drawings, must be graded to drain, must not impede an existing drainage, and must be re-seeded unless written agreements with the borrow site owner are obtained stating otherwise.

F. Private or off site borrow and excess soil disposal sites shall be restored to the satisfaction of the landowner.

31.3.10 UNDERCUTTING

A. Undercutting shall be performed where rock or soft, spongy, unstable, or other similarly unsuitable material is encountered in the excavation.

B. Where such materials are encountered, they shall be removed to a depth as directed by the Owner's Representative.

C. Rock shall be removed to a depth of no less than 6 inches below the plan shown grade established for the excavation.

D. Undercut areas shall be backfilled with granular fill or low strength concrete as directed by the Owner's Representative.

31.3.11 COMPACTION

A. Compaction of backfill and embankments shall be obtained by means of tamping rollers, sheepsfoot rollers, pneumatic tire rollers, vibrating rollers, or other mechanical tampers.

B. All such equipment shall be of a size and type sufficient to meet the minimum requirements specified herein.

C. Flooding shall not be considered an acceptable means of obtaining compaction nor shall the use of a backhoe bucket.

D. Permission on the part of the Owner or Owner's Representative to use specific compaction equipment shall not be construed as guaranteeing or implying that the use of such equipment will not result in damage to adjacent ground, existing improvements, or improvements installed under the contract or that the equipment will achieve the required compaction.

E. The Contractor shall be responsible for any damage caused by compaction equipment.

F. Material for mechanically compacted backfill and embankments must be placed in lifts which, prior to compaction, do not exceed the thickness as specified in the Related Work sections herein.

1. Lifts to be compacted with hand-directed mechanical tampers must not exceed a thickness of four (4) inches prior to compaction.

G. A minimum of six (6) inches of backfill material must be placed over the top of a pipe before operating vibratory or sheepsfoot type compaction equipment.

1. This material must be compacted using hand-directed mechanical tampers.

H. Mechanical equipment must be compatible with the material being placed.

I. Each layer shall be evenly spread, moistened, or dried, if necessary, and then tamped or rolled until the specified relative compaction has been attained.

J. Compaction adjacent to all foundations, footings, manholes, catch basins, valve boxes, curb boxes, end of sewer services and similar structures shall be performed by the use of hand-directed mechanical tampers with lifts not exceeding that specified above.

K. Each layer of backfill or embankment shall be compacted to the density specified below.

1. The material shall be compacted at a moisture content of no less than 3 percentage points above or below the optimum moisture of the Standard Proctor as defined by ASTM D698.

   The locations below shall refer to future as well as present uses. Requirements for minimum density may also be contained in **SECTION 02 32 00 – GEOTECHNICAL INVESTIGATION**. If there is a discrepancy, the more restrictive shall apply.

MINIMUM DENSITY EXPRESSED AS A PERCENTAGE OF STANDARD PROCTOR

LOCATION	PROCTOR (ASTM D698)
Unimproved areas (eg. Lawns, etc.)	90%
Surface Improved Areas (parking lots, streets, walks)	95%
Embankments	95%
Structures (buildings, manholes, floors, basins, etc.)	100%
Lagoon and earthen basin floors (lined and unlined)	98%

31.3.12 TESTING

A. The Contractor's Quality Control testing shall be in accordance with **SECTION 01 45 00 – QUALITY CONTROL** of these Specifications.

B. The Contractor shall be responsible for obtaining and providing to the Engineer, test results showing the moisture-density relationships (Standard Proctor) of representative samples of the materials to be used in all embankment and backfill construction including excavated material, engineered fill, and borrow material. The Contractor will provide additional Proctor analysis when so directed by the Engineer or at the Contractor sole discretion when soil conditions appear to have changed. The Proctor analysis must be completed prior to compaction testing being accepted. The Contractor, at the Contractor's sole risk may test the compaction of trenches, streets, and roads prior to the completion of a Proctor analysis, realizing that the Engineer has the right to reject the work and require that compaction efforts be re-done until the compaction meets the requirements of the specification.

C. Testing shall be performed by an independent testing laboratory in accordance with the requirements of ASTM D698.

D. The following Quality Control tests shall be made by the Contractor to determine the Contractor's compliance with the specifications: *(Some tests may not apply to the work to be completed during this project)*.

1. Proctor analysis and in-place density tests for trench compaction for all underground utilities installed by the Contractor.
2. In-place density test of sub-grade backfill, sub-base, base, and asphalt paving courses.
3. Gradation, liquid limit, and plasticity index tests of sub-base, base and surfacing aggregates. Tests of sub-base and base course materials shall be made from material in place. Tests of plant mix aggregates shall be made from samples obtained from the hot bins of the hot plant. Tests of concrete aggregates shall be made from samples at the mixer site.
4. Stripping tests, volume swell tests, fracture tests, wear tests, and soundness tests shall be made prior to or during the Contractor's crushing operations.

E. Acceptance and rejection of materials will be determined from tests made of the various courses complete and in-place in the field. While the Engineer may, during the course of construction, make tests at the source or point of production; it is the responsibility of the Contractor to conduct Quality Control Testing with an independent third-party testing firm to control and test his production operations in such a manner that the materials produced will meet the specification requirements. The Owner reserves the right to reject a third-party testing firm for previous substandard work or inexperienced staff.

F. The Contractor will be reimbursed for the costs of independent testing services if provisions for such reimbursement are included in **SECTION 01 21 16 – CONTINGENCY ALLOWANCES** and the Bid Form. If no allowance is made for reimbursement, the testing shall be incidental to the other bid items.

31.3.13 CLEANUP

A. Cleanup of the site shall be completed before final acceptance of the work can be made.

B. Cleanup shall include the removal and disposal of all unsuitable materials.

C. All equipment shall be removed from the site.

D. The site shall be left in a manner so as to present a clean and neat appearance.

E. Utility Cleanup:

1. All surplus waste materials remaining after completion of the backfilling operations shall be disposed of in an acceptable manner within 24 hours after completing the backfill work on each particular pipeline section.

2. Disposal at any location within the project limits shall be as specified, or as approved by the Owner's Representative; otherwise, disposal shall be accomplished outside the project limits at a location provided by the Contractor.

3. The backfilling and surplus or waste disposal operations shall be a part of the work required under the utility installation items, not as work that may be delayed until final cleanup.

4. Utility lines and trench backfill shall be tested in accordance with the provisions of **DIVISION 33 – UTILITIES** and **SECTION 31 23 33 – TRENCHING AND BACKFILL**.

31.3.14 GUARANTEE

A. The Contractor shall repair or replace as necessary any damage to the work caused by settlement that occurs within the time established in Part 01.1.04 of **SECTION 01 77 00 – CLOSEOUT PROCEDURES**.

B. Said repairs shall be made at no cost to the Owner.

END OF SECTION

PART 1 GENERAL

31.1.01 DESCRIPTION OF WORK

A. Work in this section shall include but not be limited to the following:

1. Topsoil
2. Horizon B soils
3. Stripping and Stockpiling topsoil and B Horizon soils

31.1.02 RELATED WORK SPECIFIED ELSEWHERE

The following items of related work are specified and included in other sections of this Project Manual:

SECTION 01 11 00 SUMMARY OF WORK
SECTION 31 05 00 COMMON WORK RESULTS FOR EARTHWORK
SECTION 31 11 00 CLEARING AND GRUBBING

PART 2 PRODUCTS

31.2.01 TOPSOIL (SPGM AND HORIZON B) MATERIAL

A. Contractor shall not perform any site clearing or topsoil stripping activities without specific written authorization from Owner.

B. Topsoil is the top layer of dark-colored soil down to the next color change (i.e., at the A/B horizon interface or as otherwise directed by the Owner.

1. In the construction plan drawings, topsoil may also be referred to as "suitable plant growth material" or "SPGM".

C. Except topsoil material, no soil materials shall be stockpiled directly over existing topsoil.

D. Topsoil and Horizon B soils will be stripped and stockpiled separately during the cell excavation, road construction and clay borrow excavation activities and from areas where other site improvements (e.g. sedimentation basins, drainage swales, etc.) are to be constructed.

E. Small amounts of the subsoil (Horizon B) may be mixed with the top layer.

1. In the construction in plan drawings, the Horizon B subsoil may also be referred to as "Rooting Layer".
2. Therefore, the equipment operator may remove the first 5 inches of Horizon B along with the top layer to ensure all of the topsoil is removed.

F. Topsoil and Horizon B stockpiles referred to as SPGM will typically be located at locations shown on the plan drawings.

1. Stockpile locations will be coordinated with USF&WS to avoid impacts to the wetlands easements.
2. Topsoil stockpiles will be vegetated upon their completion to reduce soil loss or erosion.

G. Depending on the location and features of the stockpile silt fence, straw bales, ditches or other erosion control mechanisms shall be employed by CONTRACTOR.

1. OWNER will provide temporary nurse crop (seeding).

PART 3 CONSTRUCTION REQUIREMENTS

31.3.01 STRIPPING AND STOCKPILING TOPSOIL (SPGM AND HORIZON B) EXCAVATION

A. Stockpiling

1. Contractor shall stockpile topsoil obtained in the stripping operation for replacement.

a. For areas where topsoil is to be replaced after underground utility construction

b. For areas involving site grading where topsoil is to be replaced in order to sustain vegetative growth.

2. In areas where topsoil will not be required as specified above, Contractor shall place topsoils in existing or proposed stockpile locations as directed by Owner.

B. Stripping

1. Remove all topsoil located at proposed:

a. Roads

b. Structures

c. Swale excavation areas

d. Buried pipes

e. Final cover and Liner areas

f. Soil borrow source and stockpile areas

g. Berms

END OF SECTION

PART 1 GENERAL

31.1.01 DESCRIPTION

A. This Specification includes clearing and grubbing including the disposal of materials for all areas within the limits required for the construction shown on the Drawings, specified herein or as directed by the Owner's Representative.

31.1.02 REFERENCES

A. Reserved

31.1.03 RELATED WORK SPECIFIED ELSEWHERE

A. The following items of related work are specified and included in other sections of these Specifications:

SECTION 01 11 00	**SUMMARY OF WORK**
SECTION 01 22 19	**MEASUREMENT AND PAYMENT**
SECTION 31 05 00	**COMMON WORK RESULTS FOR EARTHWORK**

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

31.3.01 GENERAL

A. Clearing and grubbing shall consist of clearing the surface of the ground of the designated areas of all trees, stumps, down timber, logs, snags, brush, undergrowth, hedges, heavy growth of grass or weeds, fences, structures, debris, and rubbish of any nature, natural obstructions or such material which in the opinion of the Owner's Representative is unsuitable to remain exposed in the construction areas.

B. The materials cleared from the site shall be disposed of by the Contractor off site at their own expense.

C. The areas to be cleared shall include all areas within construction limits and where otherwise designated on the Drawings.

D. All spoil materials removed by clearing and grubbing shall be disposed of at a landfill or site that accepts such material.

1. Burning will be at the Contractor's discretion and must be in compliance with all Federal and State and Local laws and regulations relative to building fires at the site.
2. If burning of the trees, brush and burnable debris is used as a method of disposal, the Contractor shall dispose of the remaining ash material off site at their own expense.
3. The material left over after burning, waste concrete, asphalt, stones, rocks and other non-organic material may not be buried on the site.
4. The Contractor shall be required to locate a disposal area outside the property limits at their own expense.
5. The Contractor shall obtain and file with the Owner's Representative, permission in writing from the property owner for use of private property for this purpose.
6. All off-site disposals shall be in compliance with all Federal, State and Local laws.
7. No blasting shall be permitted.
8. The removal of existing utilities required to permit orderly progress of work shall be accomplished by local agencies, unless otherwise shown on the Drawings.

E. Whenever a telephone or telegraph pole, gas pipeline, conduit, roadway, or other utility is encountered and must be removed or relocated, the Contractor shall notify the proper local authority or owner and attempt to secure prompt action, in accordance with **SECTION 01 31 00 – PROJECT MANAGEMENT AND COORDINATION** and **SECTION 01 71 00 – EXAMINATION AND PREPARATION** of these Specifications.

F. The Contractor shall clear the staked or indicated area of all objectionable materials.

G. Trees unavoidably falling outside the specified limits must be cut up, removed, and disposed of in a satisfactory manner.

H. In order to minimize damage to trees that are to be left standing, trees shall be felled toward the center of areas being cleared.

I. The Contractor shall preserve and protect from injury all trees and plants not to be removed.

END OF SECTION

PART 1 GENERAL

31.1.01 DESCRIPTION

A. This Specification includes stripping and stockpiling soil including topsoil from areas to be excavated for trenching and backfilling, excavation and backfill, or site grading and all work included thereto, as shown on the Drawings and as specified herein.

31.1.02 REFERENCES

1. Reserved

31.1.03 RELATED WORK SPECIFIED ELSEWHERE

A. The following items of related work are specified and included in other Sections of these Specifications:

SECTION 01 11 00	**SUMMARY OF WORK**
SECTION 01 22 19	**MEASUREMENT AND PAYMENT**
SECTION 31 05 00	**COMMON WORK RESULTS FOR EARTHWORK**
SECTION 31 25 00	**EROSION AND SEDIMENT CONTROLS**

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

31.3.01 GENERAL

A. Topsoil within the limits of excavation or embankment shall be salvaged prior to excavation or embankment by excavating the topsoil and stockpiling the material at designated locations as shown on the Drawings or as designated by the Owner in a manner that will facilitate measurement, minimize sediment damage, and not obstruct natural drainage.

31.3.02 TOPSOIL STRIPPING

A. Topsoil shall be stripped to a depth of no less than six (6) inches from all areas where excavation is to take place.

B. The full depth of topsoil shall be stripped in areas where embankment is to be placed.

C. Stripped topsoil exceeding the quantity required under the Contract shall be disposed of at the Contractor's expense.

31.3.03 TOPSOIL STOCKPILES

A. Stockpiles shall be placed and maintained to provide erosion and sediment control in accordance with **SECTION 31 25 00 – EROSION AND SEDIMENT CONTROLS** of these Specifications.

B. Imported topsoil shall be hauled to the site and stockpiled in locations designated by the Owner.

C. The Contractor shall not remove topsoil from the site without written approval from the Owner.

D. The Contractor shall restore all topsoil stockpile areas to their original condition upon placement of the stockpiled topsoil.

31.3.04 SOIL STOCKPILES

A. Stockpiles shall be placed and maintained to provide erosion and sediment control in accordance with **SECTION 31 25 00 – EROSION AND SEDIMENT CONTROLS** of these Specifications.

B. The Contractor shall restore all soil stockpile areas to their original condition upon placement of the stockpiled soil.

END OF SECTION

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PART 1 GENERAL

31.1.01 DESCRIPTION

This Section of the Project Manual includes finish grading and seed bed preparation for excavation, backfilled and embankment areas and all work included thereto, as shown on the Drawings and as specified herein.

31.1.02 RELATED WORK SPECIFIED ELSEWHERE

The following items of related work are specified and included in other Sections of this Project Manual:

SECTION 01 11 00	**SUMMARY OF WORK**
SECTION 01 33 00	**SUBMITTAL PROCEDURES**
SECTION 31 14 13	**SOIL STRIPPING AND STOCKPILING**
SECTION 31 23 00	**EXCAVATION AND FILL**
SECTION 31 23 13	**SUBGRADE PREPARATION**
SECTION 31 23 33	**TRENCHING AND BACKFILLING**
SECTION 31 50 00	**EXCAVATION SUPPORT AND PROTECTION**
SECTION 32 92 00	**TURF AND GRASSES**

PART 2 PRODUCTS (NOT USED)

PART 3 CONSTRUCTION REQUIREMENTS

31.3.01 GENERAL

A. Once the work is completed, topsoil shall be uniformly spread over all areas to receive turf establishment or agricultural areas.

B. The topsoil shall be spread to a thickness to match the existing topsoil or as directed by the Owner's Representative.

C. The topsoil shall be spread and left in a condition such that seeding or sodding can be accomplished with a minimum of additional soil preparation or tillage.

D. Excess topsoil shall be spread to provide gentler slopes or shall be removed from the site by the Owner or as directed by the Owner's Representative.

E. The Contractor shall not remove topsoil from the site without written approval from the Owner.

F. If insufficient topsoil is available on the site to spread as required herein, the Contractor shall furnish the additional topsoil required at no additional expense to the Owner.

G. The Contractor shall restore all topsoil stockpile areas to their original condition.

31.3.02 TOPSOIL FINISH GRADING

A. Earthwork finishing and topsoil covering operations shall be conducted concurrently with the grading and backfilling operations so as to permit prosecution and completion of erosion control items at the earliest practicable time.

B. Topsoil covering operations shall be carried out as soon as possible after the subsoil has been finished to grade on any significant area.

C. At the time the topsoil covering is placed, the subsoil shall be in a loose, friable condition for a uniform depth of at least 3 inches, and there shall be no erosion rills or washouts in the grading areas exceeding 3 inches.

D. To achieve this condition scarification of the subsoil will be required as directed by the Owner's Representative where ever the subsoil has been compacted by equipment operation or has become dried out and crusted, and where necessary to obliterate erosion rills.

E. All debris and any stones exceeding 1 inch in diameter on the soil surface at the time of performing the final blading operations shall be removed from the site.

F. All work involved in the finishing operations, as specified herein and as otherwise required by the Contract, shall be compensated for as part of the payment for Contract items covering excavation, trenching and backfill and no additional compensation will be made therefor.

END OF SECTION

PART 1 GENERAL

31.1.01 DESCRIPTION

A. This Specification includes work for excavation and filling or backfilling to the specified lines, grades and cross sections as shown in the Contract Documents.

31.1.02 REFERENCES

A. The current publications listed below form a part of this Specification.

B. Standards

AASHTO T99	Standard Test Method for Moisture-Density Relations of Soils and Soil-Aggregate Mixtures Using 5-lb (2.5kg) Rammer and 12-inch (305mm) Drop
ASTM D698	Standard Test Method for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft ^{3} or 600 kN-m/m ^{3})

31.1.03 RELATED WORK SPECIFIED ELSEWHERE

A. The following items of Related Work are specified and included in other sections of these Specifications.

SECTION 01 11 00	**SUMMARY OF WORK**
SECTION 01 22 19	**MEASUREMENT AND PAYMENT**
SECTION 01 33 00	**SUBMITTAL PROCEDURES**
SECTION 31 05 00	**COMMON WORK RESULTS FOR EARTHWORK**

31.1.04 SUBMITTALS

A. Laboratory test results of fill materials must be submitted to the Engineer.

B. Shop drawings and product data shall be submitted for in accordance with **SECTION 01 33 00 – SUBMITTAL PROCEDURES** of these Specifications.

PART 2 PRODUCTS

31.2.01 ON-SITE EMBANKMENT

A. Fill and backfill materials are to consist of natural soils free from organic matter, frozen material, refuse, construction debris or other man-made items. Obtain approval of the Engineer for all fill before placing and use only the fill from designated borrow areas.

31.2.02 IMPORTED BORROW MATERIALS (FOR EMBANKMENTS IN-PLACE)

A. If required, the Contractor shall obtain borrow soil for embankments from areas off the project site. Imported borrow shall be furnished at Contractor expense unless otherwise specified. Engineer approval of borrow areas is required. Imported borrow is to meet the requirements of On-Site Embankment as included herein.

PART 3 EXECUTION

31.3.01 EXCAVATION

A. Excavations shall be made to the specified lines and grades without causing rutting, pumping or other disturbance to underlying materials.

B. Excavation made outside the specified grade limits is not measured for payment in the Excavation or Embankment In-Place quantities.

1. The Contractor shall restore sub-excavated areas as directed by the Engineer. The Contractor shall correct subgrade disturbance by removing the disturbed soil and replacing and compacting to reach at least 95% of the maximum laboratory dry density determined by AASHTO T99 or ASTM D698.
2. The Contractor shall correct subgrade disturbance before placing overlying fill, backfill, base course or other courses. Disturbed soils may be replaced with imported material approved

by the Engineer and compacted to 95% of maximum laboratory dry density determined by AASHTO T99 or ASTM D698.

C. The subgrade shall be maintained to drain at all times. Side ditches or gutters from cuts to embankments shall be constructed to prevent erosion damage to embankments.

D. The Contractor shall construct and maintain temporary drainage where existing surface drainage, sewers, or under-drainage are disturbed during the work until permanent drainage facilities are completed. The Contractor shall protect and preserve all existing drains, sewers, subsurface drains, conduits, gas lines, and other underground structures which may be affected by the work. All damage to these facilities or structures resulting from the work shall be repaired to the satisfaction of the Engineer.

E. The Contractor shall excavate to minimize foundation soil and/or subgrade soil exposure to erosion, drying or infiltrating moisture. The Contractor shall excavate to provide drainage away from foundation/subgrade soils and minimize the potential for surface runoff to enter the foundation/subgrade soils.

F. The Contractor shall grade all intersecting streets and approaches within the project limits as specified or as directed using suitable materials on the surfaces to produce smooth riding and satisfactory approaches to the intersections.

31.3.02 EMBANKMENT PLACEMENT

A. General

1. The Contractor shall place fill materials (embankment) to the specified lines and grade in uniform layers not exceeding 8 inches in loose thickness. Once placed, each layer shall be moistened or aerated, mixed, and compacted as specified. Clay soils shall be worked to maximum 2-inch nominal size before compacting. Fill placement shall not begin until the subgrade construction has been approved by the Engineer. Fill shall not be placed on wet or frozen areas. Heavy equipment for spreading or compacting fill shall not be operated within 4 feet of structures.
2. If grading operations are suspended due to weather, the entire area shall be bladed until it is smooth, free of depressions and ruts, and crowned to drain water.

B. Rocks in Embankment

1. Individual rocks up to 24 inches in its longest dimension may be placed in the embankment when they are evenly distributed and are spaced to allow placing and compacting of soil between the rocks.
2. Rocks exceeding 4 inches in its longest dimension must not be placed in the top 1 foot of the finished grade.

C. Compaction

1. Compaction shall be performed in accordance with **SECTION 31 05 00 – GENERAL WORK RESULTS FOR EARTHWORK** of these Specifications.

31.3.03 SUB-EXCAVATION/REPLACEMENT BELOW SUBGRADE

A. Sub-excavation/replacement below subgrade shall be performed in accordance with **SECTION 32 11 13 – SUBGRADE MODIFICATIONS** of these Specifications.

31.3.04 TESTING

A. Testing shall include but not be limited to, Field Density Testing and Laboratory Maximum Density and Optimum Moisture.

B. Testing shall be performed in accordance with the provisions lined out in **SECTION 31 05 00** – **COMMON WORK RESULTS FOR EARTHWORK** of these Specifications.

C. Testing frequency and other related quality control criteria shall be performed in accordance with the provisions of **SECTION 01 45 00 – QUALITY CONTROL** of these Specifications.

END OF SECTION

PART 1 GENERAL

31.1.01 DESCRIPTION

A. This Specification includes subgrade preparation for areas to receive aggregate base or surface course and all work included thereto, as shown on the Drawings and as specified herein.

31.1.02 REFERENCES

A. Reserved.

31.1.03 RELATED WORK SPECIFIED ELSEWHERE

A. The following items of related work are specified and included in other Sections of these Specifications:

SECTION 01 11 00 SUMMARY OF WORK
SECTION 01 22 19 MEASUREMENT AND PAYMENT
SECTION 31 05 00 COMMON WORK RESULTS FOR EARTHWORK

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

31.3.01 GENERAL

A. Any unstable sections of subgrade discovered after excavation must be repaired per the requirements of **SECTION 32 11 13 – SUBGRADE MODIFICATIONS** of these Specifications.

B. After unstable sections of the subgrade have been repaired, and after any existing base or surface courses required to be removed have been removed, subgrade preparation as described below may be performed.

1. The Contractor shall compact and shape the subgrade for its full width as may be necessary to produce, at the time the base or surface course or topsoil is placed, the required density and stability in the upper zone of the subgrade and to produce the required grade and cross section.

    a. This upper zone of the subgrade must be re-compacted to the requirements of **SECTION 31 05 00 – COMMON WORK RESULTS FOR EARTHWORK** included in these Specifications.

    b. The "required grade and cross section" will consist of a smooth subgrade surface conforming to the prescribed elevations for the particular subgrade being prepared, prior to constructing an additional course thereon.

2. The Contractor shall scarify, dry the material, or apply water as may be necessary to obtain the required density and stability.

    a. The "required stability" will be such that when any material for base or surface courses is deposited on the subgrade, no rutting or displacement of the surface will occur.

3. All deleterious material must be removed.

4. All rocks that interfere with the trimming equipment must be removed.

5. The prescribed elevation for any point on the subgrade surface where measurement is made will be as determined from the grades shown on the Drawings or as directed by the Owner's Representative within the following tolerances:

    a. When the subgrade is being prepared for placement of an Aggregate Wearing Course or is being finished for acceptance of the grading construction, the elevation of the finished surface must not vary by more than 0.10 foot from the prescribed elevation at any point where measurement is made.

b. When the subgrade is being prepared for placement of an Aggregate Base course, the elevation of the finished surface at the time the next layer is placed must not vary by more than 0.05 foot above or 0.10 foot below the prescribed elevation at any point where measurement is made.

c. When the subgrade is being prepared for placement of a bituminous or concrete base, stabilized base, or surface course, the elevation of the finished surface at the time the next layer is placed must not vary by more than 0.05 foot from the prescribed elevation at any point where measurement is made.

31.3.02 TESTING

A. The Contractor shall retain the services of an independent testing company to test the subgrade in accordance with **SECTION 01 45 00 – QUALITY CONTROL** and **SECTION 31 05 00 – COMMON WORK RESULTS FOR EARTHWORK** of these Specifications.

B. Proof-rolling:

1. All subgrade areas of sufficient length and width to allow the passing of proof-roll equipment are subject to proof-roll testing as determined by the Engineer.

2. Definitions:

a. Deflection: Vertical movement under load, including both elastic and plastic deformation.

b. Pumping: Recoverable vertical heave of the soil created by the test load.

3. Proof-Roll Vehicle:

a. Tri-axle truck (only two rear axles with surface contact allowed).

b. 24-Ton minimum gross vehicle weight.

c. Tire size and pressure per manufacturer's specifications.

4. Execution:

a. The surface must be compacted with a smooth-drum compactor immediately before proof-rolling.

b. All surfaces must be covered completely with a single pass of the proof-roll vehicle, driving forward with observation at the rear axles.

c. Operating speed must not exceed 3 mph.

5. Evaluation Criteria:

a. New Construction: 1-inch deflection. No pumping. No surface cracking.

b. Reconstruct or Stabilized Subgrade: 0.5-inch deflection. No pumping. No surface cracking.

6. Remediation:

a. Areas not passing the required evaluation criteria must be reworked per the requirements of this Section or removed and repaired per the requirements of **SECTION 32 11 13 – SUBGRADE MODIFICATIONS** of these Specifications.

b. Roller marks and irregularities must be repaired prior to the installation of the base course.

C. Subgrade Preparation will not be paid more than once for any given area, regardless of how many times the area is re-worked due to failing tests.

END OF SECTION

PART 1 GENERAL

31.1.01 DESCRIPTION

A. This Specification includes dewatering for earthwork, utility, and structural excavations and all work included thereto, as shown on the Drawings and as specified herein.

31.1.02 REFERENCES

A. Reserved.

31.1.03 RELATED WORK SPECIFIED ELSEWHERE

A. The following items of related work are specified and included in other Sections of these Specifications:

SECTION 01 11 00 SUMMARY OF WORK
SECTION 01 22 19 MEASUREMENT AND PAYMENT
SECTION 31 05 00 COMMON WORK RESULTS FOR EARTHWORK

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

31.3.01 GENERAL

A. Drainage and dewatering shall be the responsibility of the Contractor.

B. The Contractor shall be responsible for investigating and becoming familiar with all site conditions that may affect the Work including surface water, potential flooding conditions, level of groundwater, and time of year the work is to be done.

C. The Contractor shall be responsible for obtaining all permits required for dewatering and disposal of the water.

D. The Contractor shall maintain the site in a fashion that will provide positive surface drainage to the basins and prevent surface water from flowing into excavations.

E. Surface flows shall be directed in a manner so as to minimize the flow across soils which, when exposed, may be eroded and carried into storm sewers or wetlands or other protected waters.

F. At no time during construction shall the Contractor affect existing surface or subsurface drainage patterns of adjacent property. Any damage to adjacent property resulting from the Contractor's alteration of surface or subsurface drainage patterns shall be repaired by the Contractor at no additional cost to the Owner.

G. Ample equipment shall be provided by the Contractor to remove and dispose of all water entering excavations at all times during the course of the work.

H. Dewatering shall not cease until such time the backfilling has progressed to where buoyancy of the fill or structure or pipe will not affect the alignment or integrity of the work.

I. The Contractor shall be responsible for any damage arising from the disposal of water.

J. Excavations for utilities shall be dewatered to an elevation that is at least one foot below the invert of the pipe, or as stated in **SECTION 02 32 00 – GEOTECHNICAL INVESTIGATION**, whichever is more conservative.

K. Excavations for other structures shall be dewatered to an elevation that is at least two feet beneath the bottom of the structure, or as stated in **SECTION 02 32 00 – GEOTECHNICAL INVESTIGATION**, whichever is more conservative.

L. Water removed from excavations may not be disposed into the sanitary sewer system.

M. The Contractor shall remove all temporary water control facilities when they are no longer needed or at the completion of the Project.

N. The costs of dewatering and drainage including permit fees shall be included in the price bid for the work requiring the dewatering and no direct compensation shall be made therefor.

END OF SECTION

PART 1 GENERAL

31.1.01 DESCRIPTION

A. This Specification consists of furnishing and placing Flowable Fill to the lines and grades shown on the plans as backfill in trenches and/or at other locations.

B. Flowable Fill is a self-compacting cementitious material using mineral aggregates (sand and/or gravel), native or processed materials, fly ash/cement, water, air entraining solution and (optionally) other admixtures. Flowable Fill is also known as Controlled Low-Strength Material (CLSM) and Controlled Density Fill (CDF). Flowable Fill is only permitted when specifically called out in the Contract Documents or approved by the Engineer.

31.1.02 REFERENCES

A. The current publications listed below form a part of this Specification.

B. Standards

ASTM C39	Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens
ASTM C94	Standard Specification for Ready-Mix Concrete
ASTM C150	Standard Specification for Portland Cement
ASTM C618	Standard Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use in Concrete
ASTM C494	Standard Specification for Chemical Admixture for Concrete
ASTM D4832	Standard Test Method for Preparation and Testing of Controlled Low Strength (SLSM) Test Cylinders
ACI 304	Guide for Measuring, Mixing, Transporting and Placing Concrete

31.1.03 RELATED WORK SPECIFIED ELSEWHERE

A. The following items of Related Work are specified and included in other sections of these Specifications.

SECTION 01 11 00	**SUMMARY OF WORK**
SECTION 01 22 19	**MEASUREMENT AND PAYMENT**
SECTION 01 33 00	**SUBMITTAL PROCEDURES**
SECTION 03 05 00	**COMMON WORK RESULTS FOR CONCRETE**
SECTION 31 05 00	**COMMON WORK RESULTS FOR EARTHWORK**
SECTION 31 23 33	**TRENCHING AND BACKFILL**
SECTION 32 05 00	**COMMON WORK RESULTS FOR EXTERIOR SITE IMPROVEMENTS**
SECTION 33 05 00	**COMMON WORK RESULTS FOR UTILITIES**

31.1.04 SUBMITTALS

A. Shop drawings and product data shall be submitted for in accordance with **SECTION 01 33 00 – SUBMITTAL PROCEDURES** of these Specifications.

B. The Contractor is to provide the Engineer with a mix design by either trial batch or field experience methods to verify the required compressive strength of the flowable fill at the 28-day age. The submittal must include the proportions and sources of all constituent materials, air content, other admixtures, and yield, expressed as cubic yard batch weights. Proportions shall be selected on the basis of unconfined, air-cured compressive strength test specimens.

PART 2 PRODUCTS

31.2.01 MATERIALS

A. Portland Cement: Portland cement must conform to the requirements of ASTM C150, Type 11.

B. Fly Ash: Fly Ash must conform to ASTM C618, Class C or F.

C. Coarse Aggregate, Fine Aggregate and Native Materials: Any aggregate gradation which produces performance characteristics of the flowable fill specified herein will be accepted, except as follows: The amount of material passing the #200 sieve must not exceed 20 percent. In addition, liquid limit and plasticity index must not exceed 25 and 5, respectively.

D. Water: Water used in mixing must be free of oil, salt, acid, alkali, sugar, vegetable matter or other substances injurious to the finished product.

E. Chemical Admixtures: Chemical Admixtures must conform to the requirements of ASTM C494.

31.2.02 PROPORTIONS

A. A variety of sand/gravel aggregates, and/or native (or processed) materials meeting the above requirements in conjunction with appropriate amounts of Portland cement and flyash, air entraining solution, and (optionally) other admixtures may be used to produce the required mix properties described herein.

B. The mix must contain a minimum of 50 pounds of cement and up to 250 pounds fly ash per cubic yard, with the remainder of the volumes composed of aggregates, water, and any approved admixtures.

C. **Technical Provisions**

1. Reserved.

2. The mix design for CLSM in all non-DOT areas must be similar to the following: **(WILL_OFF)**

Portland Cement	50 Lbs
Fly Ash	250 Lbs
Aggregate	2910 Lbs
Water	60 Gallons

3. Fly ash must be replaced with Portland Cement when the air temperature is less than 45 º F. **(WILL_OFF)**

4. The aggregate for CLSM must conform to the following gradation: **(WILL_OFF)**

Sieve Size	Percent Passing
¾ Inch	100
No. 200	0-10

5. The aggregate gradation must be adjusted as directed by the Owner's Representative if necessary to produce a flowable mixture. **(WILL_OFF)**

31.2.03 COMPRESSIVE STRENGTH

A. Flowable Fill must be designed to achieve a 28-day compressive strength of 30 to 500 psi when tested in accordance with ASTM C39. Excavatable mixes must be designed to attain 28-day strengths in the range of 30 - 150 psi. Test specimens must be made in accordance with ASTM

D4832. Compressive strength tests must be performed at frequencies of at least one test set per 150 cubic yards and at least one test set per day of placement unless otherwise specified.

31.2.04 CONSISTENCY

A. Consistency of the fresh mixture must be such that the mixture may be readily placed without segregation. High flowability material generally has a slump greater than 8 inches. As an alternative to slump testing, desired consistency may be approximated by filling an open-ended 3-inch diameter cylinder, 6 inches high, with the mixture and cylinder immediately pulled straight up. The correct consistency of the mixture will produce an approximate 8-inch diameter circular type spread without segregation. Adjustments of the proportions of constituents may be made to achieve proper solid suspension and optimum flowability. However, strength requirements and proper yield must be maintained for the actual batch weights.

PART 3 EXECUTION

31.3.01 GERNERAL

A. CLSM or flowable fill must be placed at the locations shown on the Drawings and may be used by the Contractor in lieu of backfill in areas where obtaining compaction of other backfill materials is considered impractical.

B. The Contractor shall comply with ACI 304 and ASTM C94 for Measuring, Mixing, Transporting, and Placing the Flowable Fill, and as herein specified.

C. The Contractor shall incorporate measures during the placement of CLSM to prevent the floating of pipes, fittings, valves, tanks or vessels around which the material is placed.

31.3.02 LIMITATIONS OF PLACEMENT

A. CLSM must not be placed on frozen ground. Mix and place only when the air temperature is at least 35 degrees F and rising. At the time of placement, Flowable Fill must be at least 40 degrees F. Stop mixing and placement when the air temperature is 40 degrees F and falling.

B. Flowable backfill must be placed by methods that preserve the quality of the material in terms of compressive strength, flow, homogeneity, plasticity and workability. The material must be transported, placed, and/or consolidated so that it flows easily around, adjacent to and under structures. It must have the flow, consistency, and workability such that the material is self-compacting.

C. Freshly placed Flowable Fill must be protected from premature drying, excessive cold, or hot temperatures. The air in contact with the backfill surface must be maintained at temperatures above freezing. Begin curing immediately following placement before the backfill has dried. Continue with curing until the backfill has attained the 28-day strength requirement. This strength is to be determined prior to any load applications or construction activity, unless otherwise directed by the Engineer.

31.3.03 NON-SHRINK BACKFILL ROAD PATCH

A. **Technical Provisions**

1. Reserved.

31.3.04 TESTING

A. Testing procedures must be performed in accordance with the provisions of **SECTION 03 31 00 – STRUCTURAL CONCRETE** of these Specifications

B. Testing frequency and other related quality control criteria must be performed in accordance with the provisions of **SECTION 01 45 00 – QUALITY CONTROL** of these Specifications.

END OF SECTION

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PART 1 GENERAL

31.1.01 DESCRIPTION

A. This Specification includes earthwork for the trenching and backfilling for pipelines and appurtenances and all work included thereto, as shown on the Drawings and as specified herein.

31.1.02 REFERENCES

A. Reserved

31.1.03 RELATED WORK SPECIFIED ELSEWHERE

A. The following items of related work are specified and included in other Sections of these Specifications:

SECTION 01 11 00	**SUMMARY OF WORK**
SECTION 01 22 19	**MEASUREMENT AND PAYMENT**
SECTION 01 33 00	**SUBMITTAL PROCEDURES**
SECTION 31 05 00	**COMMON WORK RESULTS FOR EARTHWORK**
SECTION 33 05 00	**COMMON WORK RESULTS FOR UTILITIES**

31.1.04 SUBMITTALS

A. Shop drawings and product data shall be submitted for in accordance with **SECTION 01 33 00 – SUBMITTAL PROCEDURES** of these Specifications.

PART 2 PRODUCTS

A. Trenching and Backfilling shall be constructed of the materials as shown on the Drawings, and as described herein. The respective materials shall conform to the provisions of **SECTION 31 05 00 – COMMON WORK RESULTS FOR EARTHWORK** of these Specifications.

PART 3 EXECUTION

31.3.01 GENERAL

A. Trenching operations shall proceed only so far in advance of the utility installation as will satisfy the needs for coordination of work and permit advance verification of unobstructed line and grade as planned.

B. Where interference with existing structures is possible or in any way indicated, and where necessary to establish elevation or direction for connections to in-place structures, the excavating shall be done at those locations in advance of the main operation so actual conditions will be exposed in sufficient time to make adjustments without resorting to extra work or unnecessary delay.

C. Any surface or sub-surface objects not designated for removal including irrigation systems, landscaping, and structures that are damaged or destroyed shall be replaced by the Contractor at no expense to the Owner.

31.3.02 TOPSOIL

A. Topsoil shall be stripped and stockpiled in accordance with the provisions of **SECTION 31 14 13 – SOIL STRIPPING AND STOCKPILING** of these Specifications.

B. Topsoil shall be spread and finish graded in accordance with **SECTION 31 22 19 – FINISH GRADING** of these Specifications.

31.3.03 DEWATERING

A. Dewatering shall be performed in accordance with the provisions of **SECTION 31 23 19 – DEWATERING** of these Specifications.

31.3.04 SURPLUS MATERIAL AND BORROW

A. Surplus and unacceptable material shall be disposed of in accordance with the provisions of **SECTION 31 05 00 – COMMON WORK RESULTS FOR EARTHWORK** of these Specifications.

B. Borrow shall be obtained for the sources and be of the quality specified in **SECTION 31 05 00 – COMMON WORK RESULTS FOR EARTHWORK** of these Specifications.

31.3.05 UNDERCUTTING

A. Undercutting shall be performed in accordance with the provisions of **SECTION 31 05 00 – COMMON WORK RESULTS FOR EARTHWORK** of these Specifications.

31.3.06 ROCK EXCAVATION

A. Rock excavation shall include removal and disposal of the following: (1) all boulders measuring 1/3 of a cubic yard or more in volume; (2) all rock material in ledges, bedding deposits, and un-stratified masses which cannot be removed without systematic drilling and blasting; (3) concrete or masonry structures which have been abandoned; and (4) conglomerate deposits which are so firmly cemented that they possess the characteristics of solid rock and which cannot be removed without systematic drilling and blasting. Except where trees are indicated to be removed, trees shall be protected from injury during construction operations. No tree roots over 2 inches in diameter shall be cut without express permission of the Engineer. Trees shall be supported during excavation by any means previously reviewed by the Engineer.

B. It is expected that nearly all excavation can be accomplished using conventional equipment. For general excavation, a D9R Caterpillar tractor with a single shank ripper, or equivalent equipment, is considered conventional equipment, if it can rip at a production rate of at least 300 bank cubic yards per hour. For trench excavation, a 336F Caterpillar excavator with a medium stick and a rock ripping bucket, or equivalent equipment, is considered conventional equipment, if it can excavate at a production rate of at least 30 bank cubic yards per hour. If material is encountered which the Contractor believes cannot be excavated by conventional equipment, the Engineer shall be immediately notified. The Contractor shall provide performance tests of the specified conventional or equivalent equipment. If the Engineer confirms in writing that the specified conventional equipment cannot perform at the production rates specified, the excavation shall be considered rock excavation.

C. Whenever ledge rock is encountered the Contractor shall strip from the same all overlying earth and he shall then notify the Engineer that rock is ready for measurement. The Engineer may then take levels upon the surface of the rock or he may at his discretion defer measurement until after the excavation is completed. In any event, the Contractor shall not refill any trench where rock is encountered until he is notified by the Engineer that measurement has been made. He will not be allowed any payment for any rock claimed unless the same shall have been measured as herein provided. The rock shall be excavated to a depth of six (6) inches below the bottom of the pipe and the trench shall be refilled to the proper grade with pipe bedding material.

D. Payment for rock excavation shall be as provided in the bid form as a unit price item, where provided. If a unit price item for rock excavation is not provided in the bid form, the extra cost for excavation of rock shall be paid for under Miscellaneous Work and in accordance with **SECTION 00 72 00 – GENERAL CONDITIONS**.

E. All rock found in the trench having greater diameter than eight (8) inches shall not be used as backfill but shall be disposed of as directed by the Engineer.

31.3.07 EXPLOSIVES AND BLASTING:

A. It is not anticipated that blasting will be required for this Project. Should the Contractor exhaust conventional equipment and methods for rock excavation and removal and desire to use explosives to accomplish this WORK, it shall comply with **SECTION 31 05 00 – COMMON WORK RESULTS FOR EARTHWORK**.

31.3.08 PROTECTION

A. Protection of excavations for utilities and appurtenances shall be performed in accordance with the provisions of **SECTION 31 50 00 – EXCAVATION SUPPORT AND PROTECTION** of these Specifications.

31.3.09 COMPACTION

A. Compaction of embankments shall be performed in accordance with the provisions of **SECTION 31 05 00 – COMMON WORK RESULTS FOR EARTHWORK** of these Specifications.

31.3.10 ALIGNMENT AND GRADE

A. Trench excavating shall be to a depth that will permit preparation of the foundation with bedding material a minimum of four (4) inches below the required grade and installation of the pipeline and appurtenances at the prescribed line and grade, except where alterations are specifically authorized.

1. Trench widths shall be sufficient to permit the pipe to be laid and joined properly and the backfill to be placed and compacted as specified.
2. Extra width of trench shall be provided as necessary to permit convenient placement of sheeting and shoring, to accommodate placement of appurtenances, and as required by OSHA for safety reasons.

B. Excavations shall be extended below the bottom of structure as necessary to accommodate any required granular foundation material.

1. All excavation below grade shall be to a minimum width equal to the outside pipe diameter plus two feet subject to a minimum width of 30 inches.

C. Where no other grade controls are indicated or established for the pipeline, the excavating and foundation preparations shall be such as to provide the minimum cover over the top of the pipe as specified or shown on the Drawings.

D. Trench widths shall allow for at least six inches of clearance on each side of the joint hubs.

1. The maximum allowable width of the trench at the top of pipe level shall be the outside diameter of the pipe plus two feet, subject to the considerations for alternate pipe loading set forth below.
2. The width of the trench at the ground surface shall be held to a minimum to prevent unnecessary destruction of the surface structures.
3. The maximum allowable trench width at the level of the top of pipe may be exceeded only by approval of the Engineer, after consideration of pipe strength and loading relationships.
4. Any alternate proposals made by the Contractor shall be in writing, giving the pertinent soil weight data and proposed pipe strength alternate, at least seven days prior to the desired date of decision.
5. Approval of alternate pipe designs shall be with the understanding that there will be no extra compensation allowed for any increase in material or construction costs.
6. If the trench is excavated to a greater width than that specified, the Engineer may direct the Contractor to provide a higher class of bedding and/or a higher strength pipe than that required by the Drawings or Specifications in order to satisfy design requirements, without additional compensation therefor.

31.3.11 FOUNDATION PREPARATION

A. Foundation preparations shall be conducted as necessary to produce a stable foundation and provide continuous and uniform pipe bearing between bell holes.

1. The initial excavating or backfilling operations shall produce a subgrade level slightly above finished grade as will permit hand shaping to finished grade by trimming of high spots and without the need for filling of low spots to grade.
2. Final sub-grade preparations shall be such as to produce a finished grade at the center line of the pipe that is within 0.03 foot of a straight line between pipe joints and to provide bell hole excavation at each joint as will permit proper joining of pipe and fittings.

B. In excavations made below grade to remove rock or unstable materials, the backfilling to grade shall be made with placement of granular bedding material or low strength concrete or as ordered by the Engineer and no additional compensation will be made therefor.

1. Placement of the backfill shall be in relatively uniform layers not exceeding 8 inches in loose thickness.
2. Each layer of backfill shall be compacted thoroughly, by means of approved mechanical compaction equipment, as will produce uniform pipe support throughout the full pipe length and facilitate proper shaping of the pipe bed.

C. Care shall be taken during final sub-grade shaping to prevent any over-excavation. Should any low spots develop, they shall only be filled with approved material, which shall have optimum moisture content and be compacted thoroughly, without additional compensation provided to the Contractor.

D. The finished sub-grade shall be maintained free of water and shall not be disturbed during pipe lowering operations except as necessary to remove pipe slings.

E. All costs of excavating below grade and placing foundation or bedding aggregates as required shall be included in the bid prices for pipe items to the extent that the need for such work is indicated in the Contract provisions and the Proposal does not provide for payment therefor under separate contract items.

31.3.12 BEDDING AND BACKFILL

A. All utility excavations shall be backfilled to restore pre-existing conditions as the minimum requirement, and fulfill all supplementary requirements indicated in the Drawings and Specifications.

B. The backfilling operations shall be started as soon as conditions will permit on each section of the utility so as to provide continuity in subsequent operations and restore normal public service as soon as practicable on a section-by-section basis.

C. All backfilling operations shall be pursued diligently, with proper and adequate equipment, as will assure acceptable results.

D. Granular bedding shall be placed in the trench from the bottom of the excavation (minimum four (4) inches below the bottom of the pipe) to a minimum elevation six (6) inches above the top of the pipe. If the pipe system is rigid (i.e. concrete) the top of the bedding shall be brought up to the springline of the pipe. This zone is referred herein as the pipe bedding zone.

1. Granular bedding shall extend the full width of the trench throughout the full depth of the bedding.
2. Granular bedding shall conform to the requirements of the **Prior Approved Manufactures Pipe Requirements**.
3. Within the pipe bedding zone the placement of stones, boulders, chunks, etc. greater than 8 inches in any dimension shall not be allowed.
4. Compaction of materials placed within the pipe bedding and encasement zones shall be accomplished with portable or hand equipment methods, so as to achieve thorough consolidation under and around the pipe and avoid damage to the pipe.

E. The backfilling above the bedding zone shall be accomplished with the use of suitable materials selected from the excavated materials to the extent available and practical.

1. Suitable material shall be defined as a mineral soil free of foreign materials (rubbish, debris, etc.), frozen clumps, oversize stone, rock, concrete or bituminous chunks, and other unsuitable materials, that may damage the pipe installation, prevent thorough compaction, or increase the risks of after settlement unnecessarily.
2. Material selection shall be such as to make the best and fullest utilization of the excavated material taking into consideration particular needs of different backfill zones.
3. Material containing stone, rock, or chunks of any sort shall only be utilized where and to the extent there will be no detrimental effects.

F. Above the pipe bedding zone material, the use of heavy roller type compaction equipment shall be limited to safe pipe loading.

G. Backfill materials shall be carefully placed in uniform loose thickness layers not to exceed eight (8) inches spread over the full width and length of the trench section to provide simultaneous support on both sides of the pipeline.

H. Each layer of backfill material shall be compacted effectively, by approved mechanical or hand methods, until there is no further visual evidence of increased consolidation or the density of the compacted layer conforms to the density requirements specified herein.

I. Compaction of the in-place layer shall be completed acceptably before placing material for a succeeding layer thereon.

J. The manner of placement, compacting equipment and procedure effectiveness shall be subject to approval of the Owner's Representative.

31.3.13 FLOWABLE FILL

A. Flowable Fill, when specified, shall be in accordance with the provisions of **SECTION 31 23 23.33 – FLOWABLE FILL** of these Specifications.

31.3.14 TESTING

A. The Contractor shall retain the services of an independent testing company to test the base course as specified below.

B. The Contractor's Quality Control testing shall be in accordance with **SECTION 01 45 00 – QUALITY CONTROL** of these Specifications.

C. All areas that fail any of the required tests shall be corrected at the Contractor's expense.

1. The Contractor shall have the areas retested to demonstrate that adequate compaction has been obtained.
2. The Contractor shall bear the cost of retesting and no reimbursement shall be made therefor.

D. The tests shall be conducted at random locations determined by the testing company.

E. Proctor tests shall be conducted to determine the maximum dry density of the material as necessary. No additional payment shall be made to the Contractor for the proctor tests.

F. Density and Moisture:

1. Unless otherwise noted on the Drawings or **SECTION 02 32 00 – GEOTECHNICAL INVESTIGATION**, the density and moisture content of the backfill shall be tested at a minimum frequency in accordance with the requirements of **SECTION 01 45 00 – QUALITY CONTROL**.
2. Unless otherwise noted on the Drawings or **SECTION 02 32 00 – GEOTECHNICAL INVESTIGATION**, the density and moisture of the backfill shall comply with the requirements of **SECTION 31 05 00 – COMMON WORK RESULTS FOR EARTHWORK**.

31.3.01 CORRECTIONS

A. Re-excavation and backfilling required to repair defective utilities shall be conducted in accordance with the provisions of this Section.

B. Any soils density testing on said re-excavation and backfill shall be conducted at the Contractor's expense.

C. All additional materials required and repairs to surface improvements shall be furnished without additional cost to the Owner.

END OF SECTION

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PART 1 GENERAL

31.1.01 DESCRIPTION

A. This Specification includes excavation and backfill necessary for the construction of structures and all work included thereto as shown on the Drawings and as specified herein.

31.1.02 REFERENCES

A. Reserved.

31.1.03 RELATED WORK SPECIFIED ELSEWHERE

A. The following items of related work are specified and included in other Sections of these Specifications:

SECTION 01 11 00	**SUMMARY OF WORK**
SECTION 01 22 19	**MEASUREMENT AND PAYMENT**
SECTION 01 33 00	**SUBMITTAL PROCEDURES**
SECTION 31 05 00	**COMMON WORK RESULTS FOR EARTHWORK**
SECTION 31 14 13	**SOIL STRIPPING AND STOCKPILING**
SECTION 31 22 19	**FINISH GRADING**
SECTION 31 23 19	**DEWATERING**
SECTION 31 50 00	**EXCAVATION SUPPORT AND PROTECTION**

31.1.04 SUBMITTALS

A. Shop drawings and product data shall be submitted for in accordance with **SECTION 01 33 00 – SUBMITTAL PROCEDURES** of these Specifications.

PART 2 PRODUCTS

31.2.01 GENERAL

A. Structure backfill shall be constructed of the materials as shown on the Drawings. The respective materials shall conform to the provisions of **SECTION 31 05 00 – COMMON WORK RESULTS FOR EARTHWORK** of these Specifications.

PART 3 EXECUTION

31.3.01 GENERAL

A. The work shall be constructed to the lines, grades, and cross sections as shown on the Drawings or as directed by the Owner's Representative.

B. Excavations and backfill shall be finished to provide a smooth, uniform surface.

C. Surfaces shall be sloped to drain away from the structure and slope rounding shall be employed to provide a gentle transition between the backfill and natural grade.

D. Dewatering shall not be conducted by pumping from inside footings, structural floorslabs, or other structure foundation limits without written approval by the Engineer.

E. Care shall be taken when excavating the foundations to avoid disturbing the supporting materials. Excavation by either hand or careful backhoe soil removal may be required in excavating the last few inches of material to obtain the subgrade of any item.

F. Any over-excavated subgrades shall be brought back to subgrade elevations, as indicated on the Drawings, by the Contractor at the Contractor's expense in the following manner:

G. For over-excavations of two (2) inches or less, either backfill and compact with approved granular materials, backfill with one-half (1/2) inch crushed rock, or fill with concrete at the time of the appurtenant structure concrete pour.

H. For over-excavations greater than two (2) inches, backfill and compact with an approved granular material.

I. Excavation shall be unclassified and shall consist of the removal of whatever substance or material is encountered.

31.3.02 UNSUITABLE MATERIAL

A. Poor foundation material for any of the Work shall be removed by the Contractor with no additional cost to the Owner.

B. Unsuitable foundation materials include the following:

1. Saturated by either surface or subsurface flows

2. Frozen for any reason

3. Disturbed by the Contractor's work or caused to become unacceptable for foundation material purposes by means of Contractor's equipment, manpower, or methods of work.

31.3.03 TOPSOIL

A. Topsoil shall be stripped and stockpiled in accordance with the provisions of **SECTION 31 14 13 – SOIL STRIPPING AND STOCKPILING** of these Specifications.

B. Topsoil shall be spread and finish graded in accordance with **SECTION 31 22 19 – FINISH GRADING** of these Specifications.

31.3.04 SURPLUS MATERIAL AND BORROW

A. Surplus Material shall be disposed of in accordance with the provisions of **SECTION 31 05 00 – COMMON WORK RESULTS FOR EARTHWORK** of these Specifications.

B. Borrow shall be obtained for the sources and be of the quality specified in **SECTION 31 05 00 – COMMON WORK RESULTS FOR EARTHWORK** of these Specifications.

31.3.05 UNDERCUTTING

A. Undercutting of structure excavation shall not be allowed unless rock or unsuitable materials are encountered.

B. Undercutting shall be performed in accordance with the provisions of **SECTION 31 05 00 – COMMON WORK RESULTS FOR EARTHWORK** of these Specifications.

31.3.06 COMPACTION

A. Compaction of embankments shall be performed in accordance with the provisions of **SECTION 31 05 00 – COMMON WORK RESULTS FOR EARTHWORK** of these Specifications.

31.3.07 CLEARANCE

A. The excavation for structures shall be of sufficient size so as to leave at least 12 inches of clearance between the outer surface of the structure or footing and the embankment or sheathing or shoring.

1. Where the structure bears on granular fill material that has been placed above the subgrade, the bottom of the excavation shall be oversized laterally one foot in each direction for each foot of granular fill material beneath the bearing elevation of the foundation.

31.3.08 EQUIPMENT

A. Structure excavation shall be performed with a backhoe or similar piece of equipment to minimize construction traffic over the foundation soils.

31.3.09 GEOTECHNICAL TESTING AND INSPECTION

A. The Contractor shall provide 48 hours' notice of when an area will be ready for geotechnical testing.

B. Geotechnical testing shall be under the direct supervision of a professional geotechnical engineer licensed in the state in which the work is being performed.

C. The geotechnical engineer shall inspect and test the subgrade.

D. Fill material shall be tested every vertical foot of backfill with one test per 200 square feet of area.

E. Structure backfill shall be compacted to 100% percent of standard proctor maximum density as determined by ASTM D698 unless noted otherwise.

F. All areas with inadequate compaction shall be corrected at the Contractor's expense.

1. The Contractor shall have the areas retested to demonstrate that adequate compaction has been obtained.

2. The Contractor shall bear the cost of retesting and no reimbursement shall be made therefor.

31.3.10 PROTECTION

A. The Contractor shall protect the subgrade and placed fill materials from frost and other damage at no additional cost to the Owner.

1. The Contractor shall cover the subgrade and bearing fill materials with insulation any time there is a possibility of frost.

B. Dewatering

1. Dewatering shall be performed in accordance with the provisions of **SECTION 31 23 19 DEWATERING** of these Specifications.

C. All sub-drainage, damp-proofing, waterproofing, foundation insulation and other similar work shall be installed by the Contractor and accepted by the Owner's Representative prior to backfilling.

1. The Contractor shall expose any areas where work has been covered by backfilling but not witnessed by the Owner's Representative prior to backfilling as directed by the Owner's Representative.

2. The cost of excavation and backfilling to expose covered work for which the Contractor did not provide an opportunity for review by the Owner's Representative shall be borne by the Contractor

D. Contractor is responsible to protect adjacent structures, utilities, and other improvements at no additional cost to the Owner.

E. Any damage resulting from the Contractor's performance of the work shall be corrected at no additional expense to the Owner.

END OF SECTION

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PART 1 GENERAL

31.1.01 DESCRIPTION

A. The work under this Specification shall include all temporary erosion control measures including, but not necessarily limited to, silt fence, bale checks, erosion control blankets, and interim mulch as may be necessary to control soil erosion and sedimentation.

B. The work shall include furnishing all materials, labor, and equipment required for the construction and maintenance of erosion and sediment control devices as shown on the Plans or as directed by the Engineer.

C. The work shall also include all inspections and reports as required by the storm water discharge permit for construction activities.

31.1.02 REFERENCES

A. Reserved.

31.1.03 RELATED WORK SPECIFIED ELSEWHERE

A. The following items of related work are specified and included in other sections of these Specifications:

SECTION 01 11 00	**SUMMARY OF WORK**
SECTION 01 22 19	**MEASUREMENT AND PAYMENT**
SECTION 01 33 00	**SUBMITTAL PROCEDURES**
SECTION 31 05 00	**COMMON WORK RESULTS FOR EARTHWORK**
SECTION 31 22 19	**FINISH GRADING**
SECTION 31 23 13	**SUBGRADE PREPARATION**
SECTION 32 92 00	**TURF AND GRASSES**

31.1.04 SUBMITTALS

A. Shop drawings and product data shall be submitted for in accordance with **SECTION 01 33 00 – SUBMITTAL PROCEDURES** of these Specifications.

PART 2 PRODUCTS

31.2.01 BALE CHECKS

A. Bales shall consist of material conforming to the requirements of the ND/DOT Section 261. Bales shall measure, more or less, 3 feet by 2 feet by 2 feet.

31.2.02 SILT FENCE

A. Silt fence shall be machine sliced

B. Posts

1. Posts shall be a Steel T-Post with welded plate
2. Posts shall be no less than 5 feet long.
3. Metal posts shall be a minimum weight of 1.26 lbs./ft.

C. The geotextile fabric shall be free of flaws such as tears or other defects. Any geotextile fabric which becomes damaged shall be replaced. The geotextile fabric shall meet or exceed the following requirements:

1. Type: Woven Monofilament
2. Grab Strength (ASTM D 4632): 130 lbs.
3. Apparent Opening Size (ASTM D 4751): #30 - 40 sieve range
4. Width: 36 inches

5. U.V. Stability (ASTM D 4355, 500 hrs): 70% min
6. Permittivity (minimum, ASTM D 4491): 1.0/sec

31.2.03 EROSION CONTROL BLANKETS

A. Erosion control blankets shall be in compliance with ND/DOT Specifications Section 255.

B. Staples for anchoring the erosion control blankets shall be in compliance with ND/DOT Specifications Section 856.

PART 3 EXECUTION

31.3.01 GENERAL

A. The Contractor is responsible for the preparation of the Storm Water Pollution Prevention Plan and for submittal to the State.

B. The Contractor shall make note that this project is subject to North Dakota Department of Health Water Quality authorization. The Contractor shall pay the application fee and all additional annual fees necessary until the termination of the permit has been granted by the State. The Contractor is responsible for securing and administering the permit and installation and maintenance of the erosion control structures. All Storm Water Management and Erosion Control for this Project shall comply with the requirements set forth in the General Permit.

C. The Contractor shall comply with all requirements and conditions of the General Permit and the Storm Water Pollution Prevention Plan (SWPPP). Failure to do so will result in the issuing of an order to suspend work in addition to the potential fines that may be assessed by the State.

D. The General Permit for Storm Water Discharges Associated with Construction Activities, NOI, SWPPP, NOT, and the most recent fee schedule can be found on the internet at the following location:

https://deq.nd.gov/WQ/2_NDPDES_Permits/7_Stormwater/StW.aspx

The Contractor's responsibilities regarding maintenance of erosion control structures, after final project acceptance, will be limited to the areas disturbed by the construction for this Project only. The Contractor will not be responsible for erosion control beyond the disturbed areas of this Project due to adjacent construction or any other construction activities not associated with this Project. It is the Contractor's responsibility to document the extent of disruption due to construction activities directly related to this Project. The documentation should include pictures with a date stamp that is concurrent with the date of final project acceptance

E. Temporary erosion control measures such as bale checks and silt fences shall be coordinated with the site work and turf establishment.

F. No site work will be permitted until ALL necessary temporary erosion control measures are completed and in place in order to prevent excessive soil erosion and subsequent siltation from entering wetlands, streams or storm sewers.

G. The construction of erosion control measures shall not relieve the Contractor of the responsibility for preventing or minimizing the potential for erosion or siltation.

H. The Contractor shall be responsible for all damages and clean up and the costs therefore, resulting from erosion of the soils and any siltation which may occur, regardless of the temporary erosion control measures taken.

I. Inspections of the temporary erosion control measures and reports thereof, shall be made in accordance with the storm water discharge permit for construction activities.

31.3.02 INTERIM MULCH

A. During the periods when seeding and sodding are not permitted, the Contractor shall shape the areas to their final configuration, loosen the soil as necessary, apply interim mulch and anchor the mulch as directed by the Engineer.

B. Where the Bidder's Proposal includes separate pay items for mulch and disk anchoring, the furnishing and anchoring of interim mulch shall be paid for at the unit price bid for the respective items.

C. In absence of separate pay items for mulch or disk anchoring, the furnishing and anchoring of interim mulch shall be included in the price bid for the work for which erosion control is required and no additional compensation shall be made therefor.

D. Once seeding can proceed, the Contractor shall prepare the topsoil as specified for **SECTION 32 92 00 – TURF AND GRASSES**.

31.3.03 INSTALLATION REQUIREMENTS

A. Bale checks shall be countersunk or entrenched into the soil to a depth of 4 inches below the surrounding soil.

B. Each bale shall be anchored to the ground with two 2 inch by 2 inch wood stakes or reinforcing bars.

C. The stakes or bars shall be embedded into soil at least 10 inches.

D. The bales shall be placed on edge and butted tight against each other.

E. The length of a bale check dam which crosses a ditch, swale or drainway shall be such that the crest of the bale check dam at its lowest point is lower than the ground level at the ends of the check dam so as to prevent runoff from flowing around the ends of the bale check dam.

F. Silt fence shall be constructed on fence posts which are spaced no more than 6 feet and embedded no less than 2 feet.

G. The geotextile fabric shall be secured to the upstream face of the posts.

H. The geotextile fabric shall be embedded in an anchor trench along the upstream side of the silt fence.

I. The anchor trench shall be 6 inches deep by 6 inches wide and shall extend the full length of the silt fence.

J. The geotextile fabric shall line both sides and the bottom of the anchor trench.

K. The anchor trench shall be backfilled with the excavated material which shall be firmly compacted into place.

L. Erosion Control Blankets

1. Erosion control blankets shall be installed on all slopes steeper than 3:1(H:V), at culvert ends, upstream and downstream, without rip rap protection and at locations shown on the Plans.

2. Erosion control blankets shall be installed within 24 hours after seeding, fertilizing, and mulching has been completed.

3. The blanket shall be rolled out in the direction perpendicular to the slope.

4. The blankets shall be spread out without stretching.

5. The blanket installation shall begin at the base of the slope.

6. The subsequent courses of blanket shall overlap the lower blanket by no less than 10 inches. Strip ends shall also overlap by 10 inches.

7. The aggregate end of the blanket strip along the top of the slope shall be buried in a vertical slot in the soil.

8. No less than 12 inches of blanket shall be buried in this slot.

9. Along channels anchor slots measuring one foot deep by one foot wide shall be excavated across the width of the channel.

10. The erosion control blanket shall be laid into the bottom of this slot.

11. A cover flap of blanket will be placed against the upstream face of the slot.
12. The slot shall be backfilled, seeded, mulched and the cover flap folded over the trench.
13. Anchor slots shall be spaced at intervals not to exceed 50 feet.
14. All joints and edges of the blankets shall be stapled at 3-foot intervals or less.
15. Staples placed at joint ends shall not exceed 18 inches.

31.3.04 MAINTENANCE

A. It shall be the Contractor's responsibility to maintain all erosion control measures and to inspect same after each rainfall event.

B. All displaced bale checks shall be replaced, and silt fences shall be repaired where sagging or other damage has occurred.

C. The Contractor shall review the temporary erosion control measures and make revisions as necessary in order to minimize damage due to future rainfalls.

D. Temporary erosion control measures shall be fully maintained until they are removed. The cost of maintenance of temporary erosion control shall be included in the price bid for the work for which erosion control is required and no additional compensation will be made therefor.

31.3.05 REMOVAL OF TEMPORARY EROSION CONTROL

A. Temporary erosion control devices shall remain in place until the permanent measures (turf establishment) have become established as determined by the Engineer.

B. All areas disturbed by the removal of temporary erosion control measures shall receive the same turf establishment as the areas adjacent thereto.

END OF SECTION

PART 1 GENERAL

31.1.01 DESCRIPTION

A. The work covered under this Specification includes installation of riprap and all work included thereto, as shown on the Drawings and as specified herein.

31.1.02 REFERENCES

A. The current publications listed below form a part of this Specification.

B. Standards

AASHTO T99	Standard Method of Test for Resistance to Degradation of Small-Size Coarse Aggregate and Impact in the Los Angeles Machine
AASHTO T104	Standard Method of Test for Soundness of Aggregate by Use of Sodium Sulfate or Magnesium Sulfate

31.1.03 RELATED WORK SPECIFIED ELSEWHERE

A. The following items of related work are specified and included in other sections of these Specifications:

SECTION 01 11 00	**SUMMARY OF WORK**
SECTION 01 22 19	**MEASUREMENT AND PAYMENT**
SECTION 01 33 00	**SUBMITTAL PROCEDURES**
SECTION 31 00 00	**COMMON WORK RESULTS FOR EARTHWORK**
SECTION 31 22 19	**FINISH GRADING**
SECTION 31 23 13	**SUBGRADE PREPARATION**
SECTION 32 05 00	**COMMON WORK RESULTS FOR EXTERIOR IMPROVEMENTS**

31.1.04 SUBMITTALS

A. Shop drawings shall be submitted for the riprap in accordance with **SECTION 01 33 00 – SUBMITTAL PROCEDURES** of these Specifications. The following information shall be supplied:

B. Gradation reports showing, at a minimum, the percent passing the critical sieves for the riprap class as shown in Table 256-01 "Riprap Gradations" of the ND/DOT Specifications

C. For Quarry Stone:

1. Name and location of the supply pit
2. Report of the LA Abrasion as determined by AASHTO T96
3. Soundness (Sodium Sulfate) test results as determined by AASHTO T104

PART 2 PRODUCTS

31.2.01 GENERAL

A. Unless otherwise specified on the Drawings, the riprap shall be Grade II in conformance with the gradation requirements of Table 256-01 "Riprap Gradations" of the ND/DOT Specifications.

31.2.02 FIELD STONE

A. If field stone is used, it shall not consist of sandstone, shale, or soft limestone. It shall be free from cracks and flaws that could cause splitting or breakup and shall be easily abraded or crushed.

31.2.03 QUARRY STONE

A. If quarry stone is used, it shall not consist of sandstone, limestone, or stone of sedimentary origin. The quarry stone shall meet the requirements of Table 256-02 of the ND/DOT Specifications.

31.2.04 **GROUT**

A. Where noted on the Drawings, grout consisting of 1 part Portland Cement and 2 parts sand by volume shall be used.

PART 3 EXECUTION

31.3.01 PLACEMENT

A. Stones shall be placed on sloped areas beginning at the toe of the slope.

B. The stones shall be set to obtain an even outer surface and a uniform appearance.

C. Do not drop riprap stones from a height greater than 3 feet. Stones greater than 250 pounds shall be placed with no free-fall.

D. The stones shall be placed to achieve contouring without rolling them along the surface.

E. The stones shall be placed evenly over the riprap area without material segregation or deviating from the designed slope and grade by greater than 6 inches.

31.3.02 **GROUT**

A. The riprap shall be dampened before applying grout.

B. The grout shall be recessed 1 to 3 inches below the top of the riprap.

END OF SECTION

PART 1 GENERAL

31.1.01 DESCRIPTION

A. This Specification includes shoring and protection of excavations and all work included thereto as shown on the Drawings and as specified herein.

31.1.02 REFERENCES

A. The current publications listed below form a part of this Specification.

B. Standards

OSHA	Occupational Safety and Health Act Requirements
MUTCD	Federal Highway Administration Manual on Uniform Traffic Control Devices

31.1.03 RELATED WORK SPECIFIED ELSEWHERE

A. The following items of related work are specified and included in other Sections of these Specifications:

SECTION 01 11 00	**SUMMARY OF WORK**
SECTION 01 22 19	**MEASUREMENT AND PAYMENT**
SECTION 31 05 00	**COMMON WORK RESULTS FOR EARTHWORK**

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

31.3.01 PROTECTION

A. The Contractor shall take all necessary precautions for the protection of the work and the safety of the public.

1. All barricades and obstructions shall be illuminated at night by flashing signal lights which shall be kept burning from sunset to sunrise.
2. Barricades shall be painted to increase their visibility.
3. Suitable signs shall be so placed as to show in advance where construction, barricades or detours exist.
4. All barricades and traffic control shall conform to the Federal Highway Administration Manual on Uniform Traffic Control Devices.

B. The Contractor shall at all times conduct his work as to insure the least possible obstruction to traffic and inconvenience to the general public and to insure the protection of persons and property.

C. No road or street shall be closed to the public except with the permission of the proper authority.

D. Any police or other traffic control shall be arranged for by the Contractor and be at their expense.

E. Fire hydrants on or adjacent to the work shall be kept accessible to fire-fighting equipment at all times.

F. No valves on existing utilities shall be operated without permission from the proper authority.

G. Temporary provisions shall be made by the Contractor to insure the proper functioning of all gutters, sewer inlets, drainage ditches, and irrigation ditches, which shall not be obstructed.

H. All costs of furnishing, placing, maintaining, and removing barricades, fences, and appurtenances shall be included in the unit price bid for Traffic Control which the protection is being provided and no separate compensation will be made therefor.

31.3.02 SHORING AND EXCAVATION SUPPORT

A. All excavations shall be sheeted, shored, and braced as will meet all requirements of the applicable safety codes and regulations; comply with any specific requirements of the Contract; and prevent disturbance or settlement of adjacent surfaces, foundations, structures, utilities, and other properties.

B. Any damage to the work under contract or to adjacent structures or property caused by settlement, water or earth pressures, slides, cave-ins, or other causes due to failure or lack of sheeting, shoring, or bracing or through negligence of fault of the Contractor in any manner shall be repaired at the Contractor's expense and without delay.

C. It shall be the Contractor's responsibility to provide for safe working conditions for all excavations in strict conformance with safety regulations.

1. Damages or injury resulting from settlement, slides, cave-ins, water pressure, pedestrian, or vehicular involvement shall be the responsibility of the Contractor and all damages shall be repaired at the Contractor's expense.

2. Where the depth of an excavation requires the slopes or shoring system to be designed by an Engineer retained by the Contractor, the Contractor shall furnish a copy of the Engineer's design to the Owner.

3. The Contractor shall bear all costs for shoring and slope design.

D. The Contractor shall assume full responsibility for proper and adequate placement of sheeting, shoring and bracing, wherever and to such depths that soil stability may dictate the need for support to prevent displacement.

E. Bracing shall be so arranged as to provide ample working space and so as not to place stress or strain on the in place structures to any extent that may cause damage.

F. Sheeting, shoring and bracing materials shall be removed only when and in such manner as will assure adequate protection of the in-place structures and prevent displacement of supported grounds.

1. Sheeting and bracing shall be left in place only as required by the Drawings or Specifications or ordered by the Owner's Representative.

2. Otherwise, sheeting and bracing shall be removed as the backfilling reaches the level of respective support.

3. Wherever sheeting and bracing is left in place, the upper portions shall be cut and removed to an elevation of three feet or more below the established surface grade as the Owner's Representative may direct.

G. All costs of furnishing, placing, removing sheeting, shoring, and bracing materials, including the value of materials left in place as required by the Contract, shall be included in the prices bid for which the protection is being provided and no separate compensation will be made therefor.

H. When any sheeting, shoring, or bracing materials are left in place by written order of the Owner's Representative, in the absence of specific requirements of the Contract to do so, payment will be made for those materials as an Extra Work item, including waste material resulting from upper cut-off requirements.

END OF SECTION

PART 1 GENERAL

32.1.01 DESCRIPTION

A. This Specification includes work common to exterior site improvements including but not limited to pavements, curb and gutter, sidewalks, retaining walls, and all work included thereto as shown on the Drawings and specified herein.

32.1.02 REFERENCES

A. References made in **DIVISION 32 – EXTERIOR IMPROVEMENTS** to the NDDOT Specifications shall be taken to mean the North Dakota Department of Transportation's Standard Specifications for Road and Bridge Construction, 2023 Edition unless otherwise specified.

B. The referenced sections and appurtenant sections thereto of the NDDOT Specifications shall be considered as a part of this Specification.

C. Provisions of the NDDOT Specifications are subject to modification by these Specifications.

32.1.03 RELATED WORK SPECIFIED ELSEWHERE

A. The following items of related work are specified and included in other sections of these Specifications:

SECTION 01 11 00	**SUMMARY OF WORK**
SECTION 01 22 19	**MEASUREMENT AND PAYMENT**
SECTION 01 33 00	**SUBMITTAL PROCEDURES**
SECTION 32 11 13	**SUBGRADE MODIFICATIONS**
SECTION 32 92 00	**TURF AND GRASSES**

32.1.04 SUBMITTALS

A. Refer to Related Work sections for applicable submittals required in these Contract Documents if not included herein.

B. Shop drawings and product data shall be submitted for in accordance with **SECTION 01 33 00 – SUBMITTAL PROCEDURES** of these Specifications.

PART 2 PRODUCTS

32.2.01 GENERAL

A. Refer to Related Work sections for applicable product details if not included herein.

B. Where the provisions contained within **SECTION 02 32 00 – GEOTECHNICAL INVESTIGATION** are more stringent than those contained in this Section, the provisions of **SECTION 02 32 00 – GEOTECHNICAL INVESTIGATION** shall govern.

PART 3 EXECUTION

32.3.01 GENERAL

A. These general construction requirements apply to all exterior site improvement work.

B. The limits of construction are shown on the Drawings or shall be established by the Owner's Representative.

1. The Contractor shall confine construction operations within these limits.

2. All surface objects, trees, stumps, roots, and other obstructions that are not designated to remain shall be cleared and disposed of as specified.

C. The removal of surface improvements (pavement, curb and gutter, walks) shall be held to a minimum.

1. All materials to be removed and means of replacement shall be subject to the approval of the Owner's Representative where said removals are not detailed on the Drawings.

2. All materials that are removed shall be disposed of offsite at a location provided by the Contractor.

3. All pavements, walks, or curb and gutter that are to be removed shall be sawn full depth to provide a neat and true edge.

32.3.02 TESTING

A. The Contractor's Quality Control testing shall be in accordance with **SECTION 01 45 00 – QUALITY CONTROL** of these Specifications.

B. The Contractor shall be responsible for obtaining test results showing the moisture-density relationships (Standard Proctor) of representative samples of the materials to be used in all embankment and backfill construction including excavated material, engineered fill and borrow material. Testing shall be performed by an independent testing laboratory in accordance with the requirements of ASTM D698.

C. The Contractor shall be responsible for obtaining and providing to the Owner's Representative Job Mix Formulas, Marshall Field Stability tests, graded extractions, and laboratory analysis for bituminous pavement mixtures of each type used on the Project.

D. The Contractor shall be responsible for obtaining and providing to the Owner's Representative concrete cylinder tests for all concrete placed for improvements on the Project.

E. The Contractor shall be responsible for obtaining and providing to the Owner's Representative stripping tests, volume swell tests, fracture tests, wear tests, and soundness tests prior to or during the Contractor's crushing operations.

32.3.03 CLEANUP

A. Cleanup of the site shall be completed before final acceptance of the work is made.

B. Cleanup shall include the removal and disposal of all unsuitable materials.

C. All equipment shall be removed from the site. The site shall be left in a manner so as to present a clean and neat appearance.

D. All surplus waste materials remaining after completion of the exterior site improvements shall be disposed of in an acceptable manner within 24 hours after completing the work on each area of the site.

1. Disposal at any location within the project limits shall be as specified, or as approved by the Owner's Representative; otherwise, disposal shall be accomplished outside the project limits at a location provided by the Contractor.

2. The waste disposal operations shall be a part of the work required under the exterior site improvement work, not as work that may be delayed until final cleanup.

END OF SECTION

PART 1 GENERAL

32.1.01 DESCRIPTION

A. This Specification includes all site demolition work necessary for the construction as shown on the Drawings and as specified herein.

B. Site Demolition may include but is not necessarily limited to salvage or removal of the following:

1. Sidewalks
2. Curb and gutter
3. Bituminous pavements and driveways
4. Concrete pavements and driveways
5. Gravel parking lots and driveways
6. Light poles and their foundations
7. Pipe and fittings
8. Valves and valve boxes
9. Drainage structures
10. Fence
11. Trees, shrubs, and other plantings
12. Retaining walls
13. Railings and guard rails
14. Mailboxes and flag poles
15. Signs and signposts
16. Sanitary sewer structures
17. Buildings

32.1.02 REFERENCES

A. Reserved.

32.1.03 RELATED WORK SPECIFIED ELSEWHERE

A. The following items of related work are specified and included in other Sections of these Specifications:

SECTION 01 35 43 ENVIRONMENTAL PROCEDURES
SECTION 01 33 00 SUBMITTAL PROCEDURES
SECTION 32 05 00 COMMON WORK RESULTS FOR EXTERIOR IMPROVEMENTS

32.1.04 SUBMITTALS

A. Submittals shall be in accordance with SECTION 01 33 00 – SUBMITTAL PROCEDURES.

B. The Contractor shall submit a proposed schedule of operation, coordination for shutoff, capping and continuation of utility services as required.

C. The Contractor shall submit a detailed sequence of site demolition and removal work to ensure an uninterrupted progress of Owner's on-site operations.

D. Prior to demolition work, the Contractor shall submit photographs of exterior improvements in areas adjacent to areas of site demolition work.

E. The Contractor shall submit proposed methods of security where demolition work will breach existing security measures.

32.1.05 QUALITY ASSURANCE

A. All site demolition and disposal work shall be performed in compliance with applicable requirements of governing agencies having jurisdiction, and according to the Drawings and as specified herein.

B. The Contractor shall ensure safe passage of persons and vehicles around areas of demolition.

1. Operations shall be conducted so as to prevent damage to adjacent buildings, structures, utilities, and other exterior improvements and injury to persons.

32.1.06 JOB CONDITIONS

A. The Owner assumes no responsibility for the actual condition of structures and existing exterior improvements which are to be removed or salvaged.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

32.3.01 GENERAL

A. The Contractor shall furnish all equipment, labor, materials, and tools necessary to remove and salvage or dispose of the structures, utilities above and below ground, and exterior improvements or portions thereof as shown on the Drawings and as specified herein.

32.3.02 PROTECTION

A. Prior to the removal of any wall, beam, column, or cutting of any openings, the Contractor shall examine the existing structure and, when required, shall protect the structure by shoring, bracing, or underpinning.

B. The Contractor will protect all pavement, surfacing, driveways, curbs, walks, buildings, utility poles, guy wires and other surface structures affected by construction activities in connection with performance of the contract together with grass, shrubs, yards, or pastures crossed or adjacent to the work from damage or disturbance. If removed or otherwise damaged, the Contractor shall restore to the original condition or better as determined by the Engineer. All replacement of such structures shall be made with new materials conforming to these Specifications or as approved by the Engineer. Unless listed as a pay item, all cost and work required for replacement will be the Contractor's sole expense.

C. The Contractor shall protect existing paved surfaces from damage during construction. Keep equipment off paved surfaces unless absolutely necessary. Tracked equipment shall be provided with suitable pads or sufficient surface protection to avoid damage.

D. The Contractor shall have barricades and traffic control in place prior to commencement of demolition on public rights-of-way or other areas open to the public.

E. Barricades and other protection measures shall be in place prior to the commencement of demolition to protect entry into the work area by anyone other than the necessary workers.

F. The Contractor shall be responsible for disconnecting existing utilities such as electrical power or gas from items that are to be removed or salvaged.

G. The Contractor shall utilize lockout/tag-out procedures to prevent utilities from becoming re-activated during and after removal or salvage operations.

H. The Contractor shall be responsible for all damage to streets, roads, curb, sidewalk, valley gutters, highways, railways, ditches, shoulders, embankments, culverts, bridges, or other public or private property or facility that may be damaged by moving, hauling, or otherwise transporting equipment, materials, or crew to or from the work. The Contractor shall make, without delay, satisfactory and

acceptable arrangements with the owner of the damaged property concerning its repair or replacement or payment of costs incurred in connection with said damage.

32.3.03 EXPLOSIVES

A. The use of explosives shall not be permitted.

32.3.04 SALVAGE

A. All material, improvements and equipment designated to be salvaged shall be removed with care, cleaned, and stored at the site in an area designated by the Owner.

1. All salvaged materials and equipment shall remain the property of the Owner.

B. Any pipe, fitting, or valve may be reused, at the Contractor's option, subject to the approval of the Owner's Representative.

1. Any item reused shall be cleaned of all foreign material, be of sound condition, be in good working order, and be of the same size, material and type as shown.

C. Reused items shall be repainted to match the adjacent work.

32.3.05 REMOVAL

A. All materials designated for removal shall become the property of the Contractor and shall be disposed of off-site in a manner satisfactory to the owner(s) of the property on which the material is being disposed and all governing agencies.

B. Copies of all agreements with property owners and permits from governing agencies shall be furnished to the Owner's Representative.

C. Concrete cutting shall extend to the nearest joint when there is a joint within two (2) feet of the minimum required cut.

D. The allowable limit of curbing removal as a result of utility service installations is up to ten (10) lineal feet for each utility service installation that crosses beneath an existing curb, subject to Engineer discretion according to existing conditions. Removals outside the allowable limits will be at the Contractor's expense.

E. The allowable limit of sidewalk removal as a result of utility service installations is up to a ten (10) foot length by the existing sidewalk width for each utility service installation that crosses beneath an existing sidewalk, subject to Engineer discretion according to existing conditions. Removals outside the allowable limits will be at the Contractor's expense.

F. The allowable limit of pavement removal as a result of open cut trench utility installations is up to a twelve (12) foot width along the length of the utility beneath existing pavement, subject to Engineer discretion according to existing conditions. Removals outside the allowable limits will be at the Contractor's expense.

32.3.06 DISPOSAL

A. All materials that are removed shall be disposed of off-site at a location provided by the Contractor.

32.3.07 OPENINGS

A. New openings shall be neatly cut or drilled to prevent face chipping or spalling.

B. All damaged areas shall be repaired to the satisfaction of the Owner's Representative.

32.3.08 PATCHING CONCRETE

A. All concrete that has been marred, damaged, cracked or defaced as a result of site demolition shall be repaired by the Contractor at no expense to the Owner.

B. The Contractor shall repair concrete surfaces as follows (subject to Engineer's discretion):

1. Saw cut to a depth of not less than 1 inch and remove concrete.
2. Remove exposed reinforcing only where noted or directed by the Owner's Representative.
3. Apply a latex bonding agent to the cut surface.

C. Patch with a non-shrink, nonmetallic grout finished to match the existing surface unless noted otherwise.

32.3.09 ANCHORS

A. All embedded anchors of removed items shall be cut flush with existing surfaces to remain.

32.3.10 PIPE

A. All abandoned pipes shall, at a minimum, be plugged at every open end with a watertight seal or filled entirely with flowable fill as shown on the Drawings or as directed by the Owner's Representative.

B. Asbestos cement (AC) pipe set for removal shall be performed in accordance with SECTION 01 35 43 – ENVIRONMENTAL PROCEDURES of these Specifications.

32.3.11 SIGNS AND MAILBOXES

A. Existing Signs

1. Any street marking signs that are within the construction limits shall be removed by the Contractor and stored within the limits of the right of way.
2. Stop signs and yield signs may be removed for short periods of time only if a flag person or persons as required by MUTCD are present to caution and direct traffic.
3. All stop signs and yield signs temporarily removed shall be reinstalled properly prior to removal of flag person(s).
4. All other signs, including street name signs, shall be permanently reinstalled by the Contractor upon completion of the Contract, at locations designated by the Owner's Representative.

B. Mailboxes

1. Mailboxes located within the construction limits that require moving shall be temporarily relocated by the Contractor in such a manner that mail deliveries will not be unduly hampered.
2. Upon completion of construction, the Contractor shall restore any relocated mailboxes to their original location so far as it is practical and in accordance with Federal Postal Regulations.
3. The Contractor shall be responsible for furnishing all necessary materials required to relocate the mailboxes.

C. The cost of removing and reinstalling street signs and mailboxes and providing flag persons when stop signs and yield signs are temporarily removed shall be incidental to the price bid for the work that required the relocation, and no direct payment will be made for such work.

32.3.12 TREES AND SHRUBS

A. Where trees and shrubs are to be removed, the root balls shall be removed as part of the bid item. All trees and shrubs set for removal shall be hauled offsite and disposed of at a location obtained by the Contractor.

32.3.13 CLEANUP

A. All debris, rubble, unusable materials, and items not salvaged shall become the property of the Contractor and shall be removed from the site.

END OF SECTION

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PART 1 GENERAL

32.1.01 DESCRIPTION

A. This Specification includes subgrade modification to repair soft areas of the subgrade in areas to receive aggregate base or surface course and all work included thereto, as shown on the Drawings and as specified herein.

32.1.02 REFERENCED SPECIFICATIONS

A. Reserved.

32.1.03 RELATED WORK SPECIFIED ELSEWHERE

A. The following items of related work are specified and included in other Sections of these Specifications:

SECTION 01 11 00	**SUMMARY OF WORK**
SECTION 01 22 19	**MEASUREMENT AND PAYMENT**
SECTION 01 33 00	**SUBMITTAL PROCEDURES**
SECTION 31 05 00	**COMMON WORK RESULTS FOR EARTHWORK**
SECTION 31 23 00	**EXCAVATION AND FILL**
SECTION 32 05 00	**COMMON WORK RESULTS FOR EXTERIOR IMPROVEMENTS**

PART 2 PRODUCTS

32.2.01 REPLACEMENT MATERIAL

A. Replacement material for sub-excavations shall consist of:

1. Aggregate base material conforming to the requirements of **SECTION 32 11 23 – AGGREGATE BASE COURSES** of these Specifications, or;
2. Suitable aggregate materials from within the project limits as determined by the Engineer, or;
3. Imported pitrun gravel meeting the following gradation requirements:

Sieve Opening	% Passing
3 – inch	100
No. 4	25 - 60
No. 200	12 Max

PART 3 EXECUTION

32.3.01 GENERAL

A. Unstable sections of the subgrade shall be repaired by the Contractor after the existing base or surface courses have been removed.

B. Soil is unsuitable if, in the opinion of the Engineer, it contains excessive organics, refuse, construction debris, or other objectionable material; or if it is unstable, rutting or yielding; or if it contains excessive moisture. Generally, soils will be sub-excavated and replaced only if they are unable to adequately support equipment typically used for excavation and soil transport.

1. The Contractor shall pass heavy equipment over suspect areas to determine the extents of unstable subgrade, as requested by the Engineer.
2. The Contractor shall report to the Engineer any discovered areas believed to be unsuitable.

C. Subgrade modification as described herein shall be performed at locations of unstable subgrade and as directed by the Engineer.

1. The Contractor shall sub-excavate below the subgrade for its full width as may be necessary to remove any saturated or unstable materials, according to **SECTION 31 23 00 – EXCAVATION AND FILL** of these Specifications.

    a. This shall include the excavation of saturated/unsuitable material to a minimum depth of six (6) inches determined by the Engineer.

    b. The Contractor shall assure the Engineer has measured the area where unstable materials have been removed before backfilling. Any area where unstable foundation soils have been excavated shall not be backfilled until authorized by the Engineer. Backfill placed without approval may be ordered removed and replaced at Contractor expense.

2. The excavated saturated/unsuitable material shall be replaced with aggregate material approved by the Engineer.

3. Compaction shall be performed in accordance with the provisions of **SECTION 31 05 00 – GENERAL WORK RESULTS FOR EARTHWORK** of these Specifications.

4. The resulting grade and cross section shall consist of a smooth subgrade surface conforming to the prescribed elevations for the particular subgrade being prepared, prior to constructing an additional course thereon.

D. Where the provisions contained within **SECTION 02 32 00 – GEOTECHNICAL INVESTIGATION** are more stringent than those contained within this Section, the provisions of **SECTION 02 32 00 – GEOTECHNICAL INVESTIGATION** shall govern.

32.3.02 TESTING

A. Testing shall be performed in accordance with the provisions of **SECTION 01 45 00 – QUALITY CONTROL, SECTION 31 05 00 – COMMON WORK RESULTS FOR EARTHWORK,** and **SECTION 32 05 00 – COMMON WORK RESULTS FOR EXTERIOR IMPROVEMENTS** of these Specifications.

END OF SECTION

PART 1 GENERAL

32.1.01 DESCRIPTION

A. The work covered under this Specification shall include all base course aggregate in parking and roadway areas and all work included thereto, as shown on the Drawings and as specified herein.

32.1.02 REFERENCES

A. Reserved.

32.1.03 RELATED WORK SPECIFIED ELSEWHERE

A. The following items of related work are specified and included in other sections of these Specifications:

SECTION 01 11 00 SUMMARY OF WORK
SECTION 01 22 19 MEASUREMENT AND PAYMENT
SECTION 01 33 00 SUBMITTAL PROCEDURES
SECTION 32 05 00 COMMON WORK RESULTS FOR EXTERIOR IMPROVEMENTS

32.1.04 SUBMITTALS

A. Shop drawings shall be submitted for the aggregate base courses in accordance with **SECTION 01 33 00 – SUBMITTAL PROCEDURES** of these Specifications. The following information shall be supplied:

1. Name and location of the supply pit
2. Gradation reports showing, at a minimum, the percent passing the critical sieves for the aggregate type as shown in Table 816-01 of the NDDOT Specifications
3. Report of the Plasticity Index (PI) determined in accordance with test ND T 90 "Determining the Plastic Limit and Plasticity Index of Soils"
4. Report of the Shale Content as determined by ND T 113
5. Report of the LA Abrasion as determined by AASHTO T 96
6. Percent of material retained on the No. 4 sieve having at least 1 fractured face (or 2 fractured faces for Class 7 aggregates) as determined by NDDOT 4

B. The Contractor shall submit all haul tickets at the end of each day material is delivered on site which shall contain the following information:

1. Contractor's Name
2. Name of Product
3. Street or Location Being Hauled to
4. Class of Material
5. Tonnage
6. Date Hauled
7. Pit Name

PART 2 PRODUCTS

32.2.01 GENERAL

A. The aggregate shall be installed and maintained smooth and compacted to the lines and grades shown on the Drawings.

32.2.02 AGGREGATE FOR BASE CONSTRUCTION

A. The aggregate for base construction shall consist of sound, durable particles of gravel or sand, which may include limited quantities of fine soil particles as binding material.

B. The aggregate for base construction shall be free of any deleterious or organic material.

C. The aggregate for base construction shall be of the type specified in the Drawings in conformance with Table 816-01 of the NDDOT Specifications.

D. Salvaged base course shall not be used unless otherwise noted on the Drawings or approved by the Owner's Representative.

PART 3 EXECUTION

32.3.01 PLACEMENT AND COMPACTION

A. Aggregate base construction shall be in accordance with Section 302 of the NDDOT Specifications unless otherwise specified herein.

B. The aggregate shall not be placed until the subgrade has meet the compaction, moisture, grade, and all other requirements included in these Specifications and in any geotechnical report included within **SECTION 00 31 00 – AVAILABLE PROJECT INFORMATION**.

C. The aggregate shall be compacted by means sufficient to achieve the required density.

D. In addition to the density requirements, compaction shall continue until no rutting or displacement occurs under the roller operation.

E. The prescribed elevation for any point on the base course surface where measurement is made shall be as determined from the grades shown on the Drawings or as directed by the Owner's Representative within 0.05 feet.

32.3.02 LIMITATIONS

A. No material shall be placed on frozen subgrade.

B. The material shall be spread within 48 hours of placement.

32.3.03 TESTING

A. The Contractor's Quality Control testing shall be in accordance with **SECTION 01 45 00 – QUALITY CONTROL** of these Specifications.

B. The Contractor shall retain the services of an independent testing company to test the base course as specified below.

C. All areas that fail any of the required tests shall be corrected at the Contractor's expense.

1. The Contractor shall have the areas retested to demonstrate that adequate compaction has been obtained.

2. The Contractor shall bear the cost of retesting and no reimbursement shall be made therefor.

D. The tests shall be conducted at random locations determined by the testing company.

E. Gradation:

1. Three gradation samples shall be collected from each 1,000 tons of material placed except when more than 1,000 tons are placed in a single day. When more than 1,000 tons are placed in a single day, only three samples shall be collected that day.

2. The average of the three gradations shall be considered representative of the 1,000 tons or material placed that day.

F. Miscellaneous Properties:

1. Three samples shall be collected from each 10,000-ton lot of material. If a fractional lot is less than 2,500 tons, it will be included in the previous lot.

2. The miscellaneous properties to be tested are the shale content in accordance with ND T 113, Fractured Faces in accordance with NDDOT 4, and Plasticity Index in accordance with ND T 90.

3. If Table 816-01 of the ND/DOT Specifications does not include a requirement for one or more of these properties for the class of aggregate tested, that property does not need to be tested.

4. The average of the three samples shall be considered representative of the entire lot.

G. Density and Moisture:

1. The density and moisture content of the base course shall be tested in accordance with **SECTION 01 45 00 – QUALITY CONTROL**.

2. Unless otherwise noted on the Drawings or within any geotechnical report included within **SECTION 00 31 00 – AVAILABLE PROJECT INFORMATION**, the base course shall be compacted to 95% of the maximum dry density with a moisture content of ±3% in accordance with ASTM D698.

END OF SECTION

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PART 1 GENERAL

32.1.01 DESCRIPTION

A. The work covered under this Specification includes the single application of asphalt material on a prepared sub-grade, sub-base, base, or asphalt surface as shown on the Drawings and as specified herein.

32.1.02 REFERENCES

A. The current publications listed below form a part of this Specification.

B. Standards

AASHTO M82	Standard Specification for Cutback Asphalt (Medium-Curing Type)
AASHTO M140	Standard Specification for Emulsified Asphalt
AASHTO M208	Standard Specification for Cationic Emulsified Asphalt
AASHTO T59	Standard Method of Test for Emulsified Asphalts
ASTM D244	Standard Test Methods and Practices for Emulsified Asphalts
ASTM D977	Standard Specification for Emulsified Asphalt
ASTM D2170	Standard Test Method for Kinematic Viscosity of Asphalts
ASTM D2397	Standard Specification for Cationic Emulsified Asphalt

32.1.03 RELATED WORK SPECIFIED ELSEWHERE

A. The following items of related work are specified and included in other sections of these Specifications:

SECTION 01 11 00	**SUMMARY OF WORK**
SECTION 01 22 19	**MEASUREMENT AND PAYMENT**
SECTION 01 33 00	**SUBMITTAL PROCEDURES**
SECTION 32 05 00	**COMMON WORK RESULTS FOR EXTERIOR IMPROVEMENTS**
SECTION 32 11 23	**AGGREGATE BASE COURSES**
SECTION 32 12 16	**ASPHALT PAVING**

32.1.04 SUBMITTALS

A. The Contractor shall submit tack coat product data to the Engineer in accordance with **SECTION 01 33 00 – SUBMITTAL PROCEDURES** of these Specifications.

PART 2 PRODUCTS

32.2.01 GENERAL

A. Asphalt material must meet the requirements of Tables 1, 2, and 3, as shown herein:

TABLE 1
SPECIFICATIONS FOR ANIONIC EMULSIFIED ASPHALTS

TYPE	RAPID SETTING				MEDIUM SETTING				SLOW SETTING			
GRADE	RS-1		RS-2		MS-1		MS-2	MS-2h	SS-1		SS-1h	
Test of Emulsions:	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
Viscosity, Saybolt-Furol at 77°F (25°C)	20	100	...	...	20	100	100	...	100	...	20	100	20	100
Viscosity, Saybolt-Furol at 122°F (50°C)	...	...	75	400	...	...	...	...	...	...	...	...	...	...
Demulsibility*, 35ml, 0.02N $CaCl_2$, percent	60	...	60	...	...	...	...	...	...	...	...	...	...	...
Residue by Distillation, percent	55	...	63	...	55	...	65	...	65	...	57	...	57	...
Test on Residue from distillation tests														
Penetration, 77°F (25°C), 100g, 5s	100	200	100	200	100	200	100	20	40	90	100	200	40	90
Ductility, 77°F (25°C), 5cm/min, cm.	40	...	40	...	40	...	40	...	40	...	40	...	40	...
Solubility in Trichloroethylene	97.5	...	97.5	...	97.5	...	97.5	...	97.5	...	97.5	...	97.5	...
Suggested Uses:	Surface treatment penetration macadam and tack coat			Surface treatment and penetration macadam			Plant or road mixture with course aggregate, substantially all of which is retained on a No. 8 (2.36 mm) sieve and practically none of which passes a No. 8 (2.36 mm) sieve and practically none of which passes a No. 200 (0.075 mm) sieve, tack		Plant or road mixture with course aggregate, substantially all of which is retained on a No. 8 (2.36 mm) sieve and practically none of which passes a No. 200 (0.075 mm) sieve.		Plant or road mixture with graded and fine aggregates, substantially quantity of which passes a No. 8 (2.36 mm) sieve and a portion of which may pass a No. 200 (0.075 mm) sieve. Slurry seal treatment.			

* The demulsibility test shall be made within 30 days from the date of shipment.

TABLE 2
SPECIFICATIONS FOR CATIONIC EMULSIFIED ASPHALTS
ASSHTO M208

TYPE	RAPID SETTING				MEDIUM SETTING						SLOW SETTING		
GRADE	CRS-1		CRS-2		CMS-1		CMS-2h		CSS-1		CSS-1h		
Test of Emulsions:	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	
Viscosity, Saybolt-Furol at 77°F (25°C)	...	...	...	...	...	...	...	...	...	20	100	20	100
Viscosity, Saybolt-Furol at 122°F (50°C)	...	20	100	100	400	50	450	50	450	...	...	...	...
Demulsibility[A] 35ml, 0.08% sodium dioctyl sultrosuccinate, %	40	...	40	...	...	...	...	...	...	...	...	...	...
Particle Charge Test	Pos	...	Pos	...	Pos	...	Pos	...	Pos[B]	...	...	...	Pos[B]
Distillation: Oil distillation by volume of emulsion, percent	...	...	3	...	3	...	12	...	12	...	...	...	...
Residue, percent	60	...	...	65	...	65	...	65	...	...	57	...	57
Test on Residue from distillation tests													
Penetration, 77°F (25°C), 100g, 5s	100	250	100	250	100	250	40	90	100	250	40	90	...
Ductility, 77°F (25°C), 5cm/min, cm.		40	...	40	...	40	...	...	40	...	40	...	40
Solubility in Trichloroethylene	97.5	...	...	97.5	...	97.5	...	97.5	...	...	97.5	...	97.5
Suggested Uses	Surface treatment, penetration macadam and tack coat		Surface treatment and penetration macadam		Plant or road mixture with course aggregate, substantially all of which is retained on a No. 8 (2.36 mm) sieve and practically none of which passes a No. 200 (0.075 mm) sieve.				Plant or road mixture with graded and fine aggregates, a substantial quantity of which passes a No. 8 (2.36 mm) sieve and a portion of which may pass a No. 200 (0.075 mm) sieve. Slurry seal treatment.				

[A] The demulsibility test shall be made within 30 days from the date of shipment.
B If the particle charge test result is inconclusive, material having a maximum pH value of 6.7 will be acceptable.

TABLE 3
SPECIFICATION FOR MEDIUM CURING LIQUID ASPHALTS

	MC-30		MC-70		MC-250		MC-800		MC-3000	
	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.
Kinematic viscosity at 140 °F (60 °C), centistokes[1]	30	60	70	140	250	500	800	1600	3000	6000
Flash point (tag, open-cup), °F (°C)	100 (38)	—	100 (38)	—	150 (66)	—	150 (66)	—	150 (66)	—
Water, %	—	0.2	—	0.2	—	0.2	—	0.2	—	0.2
Distillation test: distillate, percentage by volume of total distillate to 680 °F (360 °C)										
to 437 °F (225 °C)	—	25	0	20	0	10	—	—	—	—
to 500 °F (260 °C)	40	70	20	60	15	55	0	35	0	15
to 600 °F (315 °C)	75	93	65	90	60	87	45	80	15	75
Residue from distillation to 680 °F (360 °C) volume percentage of sample by difference	50	—	55	—	67	—	75	—	80	—
Tests on residue from distillation:										
Penetration, 100 g, 5 sec. at 77 °F (25 °C), dmm	120	250	120	250	120	250	120	250	120	250
ductility[2], 5 cm/min, cm	100	—	100	—	100	—	100	—	100	—
solubility, %	99	—	99	—	99	—	99	—	99	—
Spot test	negative for MC-3000 only									

Notes:

1. As an alternate, Saybolt-Furol viscosities may be specified as follows:
   Grade MC-70 - Furol viscosity at 122 °F (50 °C) - 60 to 120 sec.
   Grade MC-30 - Furol viscosity at 77 °F (25 °C) - 75 to 150 sec.
   Grade MC-250 - Furol viscosity at 140 °F (60 °C) - 125 to 250 sec.
   Grade MC-800 - Furol viscosity at 180 °F (82.2 °C) - 100 to 200 sec.
   Grade MC-3000 - Furol viscosity at 180 °F (82.2 °C) - 300 to 600 sec.
2. If the ductility at 77 °F (25 °C) is less than 100, the material will be acceptable if its ductility at 60 °F (15.5 °C) is more than 100.

A. **Technical Provisions**

1. Reserved.

2. Allowed asphalt material type and grade shall be the following:

Type and Grade	Use
PENETRATING EMULSION PRIME, PEP	Prime Coat
LIQUID ASPHALT, MC-70	Prime Coat
EMULSIFIED ASPHALT, SS-1 or SS-1h	Tack Coat
EMULSIFIED ASPHALT, CRS-1, CRS-2, or CSS-1h	Tack Coat

32.2.02 BLOTTER SAND

A. **Technical Provisions**

1. Reserved.
2. Blotter Sand must meet the requirements of MDT 407.02.2. **(MDT)**
   a. Blotter material shall be 100% passing the ½-inch (12.5 mm) screen having a PI of 6 or less.
3. Blotter Sand must meet the requirements of NDDOT Section 816, Class 44. **(NDDOT)**

PART 3 EXECUTION

32.3.01 DISTRIBUTORS

A. A pressure distributor must be used for prime and tack coats that distributes the required amount of asphaltic material at the specified temperature in a uniform spray, without atomization. The distributor must be pneumatic-tired and must not rut or otherwise damage the surface being sprayed. The distributer must be equipped with a bitumeter, having a dial visible to the truck driver for maintaining the constant speed required for application at the specified rate.

B. The pump may be operated by a separate power unit or by the truck power unit. The pump must be equipped with a tachometer, having a dial readily visible to the operator, registering gallons per minute passing through the nozzles.

C. The distributor must be designed so that the normal width of application is not less than 12 feet, with provision for the application of lesser or greater width when necessary. The distributor must be designed or equipped so that the height of the spray bar above the surface to be sprayed, may be set and maintained within a tolerance of 1/2 inch (plus or minus) of the height required to provide a uniform application.

D. The distributor must be equipped and operated so that the asphaltic material is circulated or agitated throughout the entire heating system. Constant and accurate temperature indication of the asphaltic material must be provided. The thermometer well must be placed without contacting the heating tube.

32.3.02 ASPHALT PRIME COAT

A. Application Rate:

1. MC-70 must be sprayed at a rate of 0.20 to 0.50 gallons per square yard, under average conditions.
2. PEP must be sprayed at a rate of 0.10 to 0.30 gallons per square yard, under average conditions.

B. Immediately before applying the prime coat, the surface to be primed must be cleaned of all dirt and loose materials. Blowers or a power broom may be used, supplemented by hand brooming if necessary. The surface to receive the asphalt material must be finished to the specified requirements for smoothness, compaction, and grade. The prime coat may only be applied when the surface is dry or slightly damp and when the air temperature in the shade is not less than 50° F (10° C).

C. Before spraying, building paper or similar disposable material must be placed over the surface from the joint back, for the distance required for the spray bar to begin spraying and operating at full force when the surface to be treated is reached. Once the asphalt is applied, the building paper shall be removed and disposed by the Contractor. The spray bar must shut off instantaneously at each construction joint to assure a straight line and full application of asphalt prime up to the joint. If required to prevent dripping, a drip pan may be inserted under the nozzle where the application

ends. Primer material must be applied to touch-up any and all spots missed by the distributor. A hand sprayer may be used for touch-up application.

D. Surfaces of structures and trees adjacent to the area being treated must be protected from being spattered or marred. Asphalt material must not be discharged into borrow pits or gutters.

E. Immediately after application, pools of prime coat occurring in depressions must be broomed or squeegeed over the surrounding surface.

F. After application, the prime coat must be left undisturbed to achieve curation.

1. MC-70 minimum cure time = 24 hours.

2. PEP minimum cure time = 4 hours.

G. All excess asphalt material remaining on the surface after cure time must be blotted with sand before opening the surface to traffic. The primed surface must be maintained by the Contractor until the surfacing has been placed. Maintenance includes spreading any additional sand required to prevent asphalt material adhering to the tires of vehicles and patching all breaks in the surface with additional bituminous material. Any area of surface disturbed by traffic or otherwise, is to be cleaned before the next course is placed. Before placing the surface course, all excess and/or loose sand used for blotter must be swept from the surface.

H. **Technical Provisions**

1. Reserved.

2. The use of a prime coat is not required. If the Contractor choses to use a prime coat, any costs associated with the prime coat will be included in other bid items, with no additional cost to the Owner. **(WILL_OFF)**

32.3.03 ASPHALT TACK COAT

A. The asphalt tack coat is the application of a diluted asphalt emulsion to ensure bond between the surface being paved and the overlying course. Immediately before applying the tack coat, the surface to be tacked must be cleaned of all dirt and loose materials using blowers or power brooms, supplemented by hand brooming if necessary.

B. The tack coat may only be applied when the surface is dry or slightly damp, and when the air temperature in the shade is at least 50° F (10° C).

C. Emulsified asphalt may be diluted with water. When diluting emulsified asphalt, the amount of water added to the dilution shall not exceed the amount of emulsified asphalt.

D. Before spraying, building paper or similar disposable material must be placed over the surface from the joint back, for the distance required for the spray bar to begin spraying and operating at full force when the surface to be treated is reached. Once the asphalt is applied, the building paper shall be removed and disposed by the Contractor. The spray bar must shut off instantaneously at each construction joint to assure a straight line and full application of asphalt tack coat up to the joint. If required to prevent dripping, a drip pan may be inserted under the nozzle where the application ends. Tack coat material must be applied to touch-up any and all spots missed by the distributor. A hand sprayer may be used for touch-up application.

E. After the tack coat has been applied, the Contractor shall assure it is undisturbed until the asphalt emulsion has "broken", generally within 30 minutes of application. The next paving course may be placed after the emulsion has broken.

F. The Contractor shall schedule operations so that all tack coats are placed with the asphalt-paving course in the same day.

END OF SECTION

PART 1 GENERAL

32.1.01 DESCRIPTION

A. The work covered under this Specification includes all plant mixed bituminous paving in parking and roadway areas and all work included thereto, as shown on the Drawings and as specified herein.

32.1.02 DEFINITIONS

A. Lot: The amount of material placed each production day. If a shoulder is placed monolithically with the mainline, the shoulder quantity will be excluded from the quantity of material represented by the lot.

B. Sublot: A single pavement lift, one paver width wide and 2,000 feet long. If a partial sublot is less than 1,000 feet, it will be included in the previous sublot. A partial sublot greater than 1,000 feet in length will be considered a separate sublot.

32.1.03 REFERENCES

A. The following documents form a part of this Specification to the extent stated herein and will be the latest editions thereof. Where differences exist between codes and standards, the requirements of these Specifications will apply.

B. Standards

AASHTO M320	Standard Specification for Performance-Graded Asphalt Binder
AASHTO M323	Standard Specification for Superpave Volumetric Mix Design
AASHTO R30	Standard Practice for Mixture Conditioning of Hot Mix Asphalt (HMA)
AASHTO R35	Standard Practice for Superpave Volumetric Design for Asphalt Mixtures
AASHTO T19	Standard Method of Test for Bulk Density ("Unit Weight") and Voids in Aggregate
AASHTO T96	Standard Method of Test for Resistance to Degradation of Small-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine
AASHTO T283	Standard Method of Test for Resistance of Compacted Asphalt Mixtures to Moisture-Induced Damage
ND D4791	Test Method for Flat Particles, Elongated Particles, or Flat Elongated Particles in Coarse Aggregate
ND T2	Sampling of Aggregates
ND T11	Material Finer Than No. 200 Sieve in Mineral Aggregates by Washing
ND T27	Sieve Analysis of Fine and Coarse Aggregates
ND T84	Specific Gravity and Absorption of Fine Aggregate
ND T85	Specific Gravity and Absorption of Coarse Aggregate
ND T89	Determining the Liquid Limit of Soils
ND T90	Determining the Plastic Limit and Plasticity Index of Soils
ND T113	Lightweight Pieces in Virgin Aggregate
ND T166	Bulk Specific Gravity of Compacted Hot Mix Asphalt Using Saturated Surface-Dry Specimens
ND T176	Plastic Fines in Graded Aggregates and Soils by Use of the Sand Equivalent Test
ND T209	Theoretical Maximum Specific Gravity and Density of Hot Mix Asphalt
ND T248	Reducing Samples of Aggregate to Testing Size
ND T255	Total Evaporable Moisture Content of Aggregate by Drying
ND T304	Fine Aggregate Angularity
ND T312	Preparing and Determining the Density of Hot Mix Asphalt Specimens by Means of Superpave Gyratory Compactor
NDDOT	Field Sampling and Testing Manual
NDDOT	Standard Specifications for Road and Bridge Construction
NDDOT 1	Sampling of Bituminous Materials
NDDOT 4	Percentage of Fractured Particles in Coarse Aggregate

C. References within the above standards to approval by the Department or the Engineer will be taken to mean the Owner's Representative.

32.1.04 RELATED WORK SPECIFIED ELSEWHERE

A. The following items of related work are specified and included in other sections of these Specifications:

SECTION 01 11 00	**SUMMARY OF WORK**
SECTION 01 22 19	**MEASUREMENT AND PAYMENT**
SECTION 01 33 00	**SUBMITTAL PROCEDURES**
SECTION 32 05 00	**COMMON WORK RESULTS FOR EXTERIOR IMPROVEMENTS**
SECTION 32 11 23	**AGGREGATE BASE COURSES**

32.1.05 SUBMITTALS

A. The Contractor shall submit an asphalt mix design to the Engineer in accordance with **SECTION 01 33 00 – SUBMITTAL PROCEDURES** of these Specifications and in accordance with NDDOT Standard Specifications for Road and Bridge Construction, Section 430.04.D.

B. Each job mix formula will be prepared at the Contractor's expense. This includes the original and any subsequent mix designs that may be needed to keep the material within the provisions and standards of the Specifications.

C. The Contractor shall submit all haul tickets at the end of each day material is delivered on site, which must contain the following information:

1. Contractor's Name
2. Name of Source of Product
3. Date Hauled
4. Name of Product
5. Street or Location Being Hauled to
6. Tonnage

D. The Contractor shall submit plant reports and oil cut off sheets to the Engineer at the end of each day of paving so that the produced material can be compared to the approved mix design. In no case will paving commence prior to the Contractor submitting all previous days' plant reports and oil cut off sheets. Plant reports/oil cut off sheets must contain the following information:

1. Contractor's Name
2. Name of Plant
3. Date of Production
4. Name of Product
5. Street or Location Being Hauled to
6. Percentage of AC
7. Tonnage

PART 2 PRODUCTS

32.2.01 BITUMINOUS MATERIALS

A. The bituminous material for Hot Bituminous Pavement must meet the requirements of AASHTO M320.

B. Bituminous binder must be PG 58-28 or PG 58-34 for patchwork and PG 58-34 for all other work.

C. Bituminous material for prime coat and tack coat must be as specified in **SECTION 32 12 13.16 – ASPHALTIC TACK COATS** of these Specifications.

32.2.02 AGGREGATES FOR BITUMINOUS MIXTURE

A. Aggregate for Hot Bituminous Pavement must conform to the requirements of NDDOT Standard Specifications for Road and Bridge Construction, Sections 430.03.B.

B. Aggregate must be virgin material. No Recycled Asphalt Pavement (RAP) will be approved.

PART 3 EXECUTION

32.3.01 HOT MIXED BITUMINOUS PAVEMENT

A. Hot Bituminous Pavement must be constructed in conformance with the provisions of NDDOT Standard Specifications for Road and Bridge Construction, Sections 430.04.F - L.

32.3.02 EQUIPMENT

A. Equipment used in paving operations must be in conformance with the requirements of NDDOT Standard Specifications for Road and Bridge Construction, Section 430.02.

32.3.03 TACK COAT

A. Tack coats will be required between paved courses and against all hard vertical surfaces to be paved. Tack coats must conform to the requirements of **SECTION 32 12 13.16 – ASPHALTIC TACK COATS** of these Specifications.

32.3.04 SEAL COAT / FOG COAT

A. Seal coats and fog coats must conform to the requirements of **SECTION 32 12 36.13 – ASPHALTIC SEAL COATS AND FOG COATS** of these Specifications.

B. Seal coats and fog coats are only required where shown on the Drawings or included in the Bidder's Proposal.

32.3.05 TESTING

A. The Contractor's Quality Control testing must be performed in accordance with **SECTION 01 45 00 – QUALITY CONTROL** of these Specifications.

B. The Contractor shall retain the services of an independent testing company to perform quality control sampling and testing on the aggregate and bituminous mix as the mix is being produced and placed.

C. The cost to provide quality control sampling and testing will be borne by the Contractor and will be considered incidental to the work.

D. All quality control tests must be conducted at random locations as determined by the testing company.

E. The Contractor shall perform all items outlined as "Contractor Responsibility" as specified in the NDDOT Field Sampling and Testing Manual, Section 430.02, "Quality Control Testing".

F. During aggregate production, test results must be furnished to the Engineer by noon the day following the test. During mix production, test results must be furnished to the Engineer upon completion of the test.

G. If the quality control test results for ND T176 or ND T113 indicate uniform results, the Engineer may issue a written notice reducing the frequency of these tests.

H. All areas that fail any of the required tests must be corrected at the Contractor's expense.

1. The Contractor shall have the corrected areas retested.

2. The Contractor shall bear the cost of retesting and no reimbursement will be made therefor.

I. Documentation: The Contractor shall record and maintain documentation of all quality control test in accordance with the requirements of NDDOT Standard Specifications for Road and Bridge Construction, Section 430.04.E.4.

J. Allowable working ranges: Field test results may vary from the mix design target values in accordance with the requirements of NDDOT Standard Specification for Road and Bridge Construction, Section 430.E.5.

K. Density:

1. The in-place density of the asphalt paving must be tested a minimum of once every 300 SY.

2. A nuclear density gauge may be used verify density. The gauge must be operated by a certified technician.

3. Technical Provisions

a. Reserved.

END OF SECTION

PART 1 GENERAL

32.1.01 DESCRIPTION

This Section of the Project Manual includes asphaltic seal coats and asphaltic fog coats as shown on the Drawings and specified in this Project Manual.

32.1.02 REFERENCED SPECIFICATIONS

A. Section 420 and sections referenced therein of the North Dakota Department of Transportation *Standard Specifications for Road and Bridge Construction*, 2023 Edition (NDDOT Standard Specifications) is hereby included by reference to be a part of this Project Manual.

B. The provisions of said Section 420 shall apply to the work except as modified by the provisions of this Project Manual.

C. References in said Section 420 to the Chief Engineer, Department, Director, Engineer, Inspector or Project Manager shall be construed to mean the Owner's Representative as defined in this Project Manual.

D. Measurement and Payment for the work in this **SECTION 32 12 36.13** of the Project Manual shall be in accordance with the provisions of **SECTION 01 22 19 MEASUREMENT AND PAYMENT** of this Project Manual.

E. All testing noted by the ND/DOT Specifications to be performed by the Department shall instead be performed by the independent testing laboratory retained by the Contractor.

1. The costs of said testing shall be borne by the Contractor unless provision for reimbursement is made in **SECTION 01 21 00 ALLOWANCES**.

F. The Contractor will be reimbursed for the costs of independent testing services if provisions for such reimbursement are included in **SECTION 01 21 00 ALLOWANCES** and the Bid Form.

32.1.03 RELATED WORK SPECIFIED ELSEWHERE

The following items of related work are specified and included in other Sections of these Specifications:

SECTION 01 11 00 SUMMARY OF WORK
SECTION 01 33 00 SUBMITTAL PROCEDURES
SECTION 32 05 00 COMMON WORK RESULTS FOR EXTERIOR IMPROVEMENTS

PART 2 PRODUCTS

32.2.01 ASPHALTIC MATERIAL

A. Asphaltic material for seal coat shall conform to the requirements of **SCHEDULE 32012036.13** at the end of this section of the Project Manual.

B. Asphaltic material for fog coat shall conform to the requirements of **SCHEDULE 32012036.13** at the end of this section of the Project Manual.

C. Aggregate material for seal coat shall conform to the requirements of **SCHEDULE 32012036.13** at the end of this section of the Project Manual.

D. Aggregate material for fog coat shall conform to the requirements of **SCHEDULE 32 12 36.13** at the end of this section of the Project Manual.

PART 3 CONSTRUCTION REQUIREMENTS

32.3.01 GENERAL

A. Construction of seal coat or fog coat shall conform to the construction requirements specified in Section 420 of the NDDOT Standard Specifications unless noted otherwise.

B. Application rates for seal coat and fog coat materials shall be as shown in **SCHEDULE 32 12 36.13** at the end of this Section of the Project Manual.

SCHEDULE 32 12 36.13
ASPHALTIC SEAL COATS AND FOG COATS

Component	Material	Application Rate	Remarks
Asphaltic Material for Seal Coat	Emulsified Asphalt CRS-2P		1
Aggregate Material for Seal Coat	Class 43		2
Asphaltic Material for Fog Coat			3
Aggregate Material for Fog Coat			3

REMARKS

1 See Section 818.02E of NDDOT Standard Specifications

2 See Section 816.03 of NDDOT Standard Specifications

3 Not Required

END OF SECTION

PART 1 GENERAL

32.1.01 DESCRIPTION

A. The work covered under this Specification includes all shoulder and surfacing aggregate in parking and roadway areas and all work included thereto, as shown on the Drawings and as specified herein.

32.1.02 REFERENCES

A. The following documents form a part of this Specification to the extent stated herein and will be the latest editions thereof. Where differences exist between codes and standards, the requirements of these Specifications will apply.

B. Standards

ND T90	Determining the Plastic Limit and Plasticity Index of Soils
ND T113	Lightweight Pieces in Virgin Aggregate
NDDOT 4	Percentage of Fractured Particles in Coarse Aggregate

32.1.03 RELATED WORK SPECIFIED ELSEWHERE

A. The following items of related work are specified and included in other sections of these Specifications:

SECTION 01 11 00 SUMMARY OF WORK
SECTION 01 22 19 MEASUREMENT AND PAYMENT
SECTION 01 33 00 SUBMITTAL PROCEDURES
SECTION 32 05 23 COMMON WORK RESULTS FOR EXTERIOR IMPROVEMENTS

32.1.04 SUBMITTALS

A. The Contractor shall submit a gradation and test results for all other properties necessary to verify conformance to Section 816 of the NDDOT Specifications for the specified aggregate type. The submittals shall be made to the Engineer in accordance with **SECTION 01 33 00 – SUBMITTAL PROCEDURES** of these Specifications.

B. The Contractor shall submit all haul tickets at the end of each day material is delivered on site which shall contain the following information:

1. Contractor's Name
2. Name of Product
3. Street or Location Being Hauled to
4. Class of Material
5. Tonnage
6. Date Hauled
7. Pit Name

PART 2 PRODUCTS

32.2.01 SURFACING AND SHOULDER AGGREGATE

A. The aggregate for surfacing and shoulders shall be Class 13 in conformance with Section 816 of the NDDOT Specifications unless otherwise noted on the Drawings.

B. Technical Provisions

1. Reserved.

2. The aggregate for surfacing and shoulders shall be Class 5 in conformance with Section 816 of the NDDOT Specifications**.**

PART 3 EXECUTION

32.3.01 SURFACING AND SHOULDER AGGREGATE CONSTRUCTION

A. Surfacing aggregate construction shall be in accordance with Section 302 of the NDDOT Specifications.

B. Shoulder aggregate construction shall be in accordance with Section 302 of the NDDOT Specifications.

C. The prescribed elevation for any point on the aggregate surface where measurement is made shall be as determined from the grades shown on the Drawings or as directed by the Owner's Representative within the following 0.05 feet.

32.3.02 TESTING

A. The Contractor's Quality Control testing shall be in accordance with **SECTION 01 45 00 – QUALITY CONTROL** of these Specifications.

B. The Contractor shall retain the services of an independent testing company to test the surface course as specified below.

C. All areas that fail any of the required tests shall be corrected at the Contractor's expense.

1. The Contractor shall have the areas retested to demonstrate that adequate compaction has been obtained.

2. The Contractor shall bear the cost of retesting and no reimbursement shall be made therefor.

D. The tests shall be conducted at random locations determined by the testing company.

E. Gradation:

1. Three gradation samples shall be collected from each 1,000 tons of material placed except when more than 1,000 tons are placed in a single day. When more than 1,000 tons are placed in a single day, only three samples shall be collected that day.

2. The average of the three gradations shall be considered representative of the 1,000 tons or material placed that day.

F. Miscellaneous Properties:

1. Three samples shall be collected from each 10,000-ton lot of material. If a fractional lot is less than 2,500 tons it will be included in the previous lot.

2. The miscellaneous properties to be tested are the shale content in accordance with ND T113, Fractured Faces in accordance with NDDOT 4, and Plasticity Index in accordance with ND T90.

3. If Table 816-01 of the NDDOT Specifications does not include a requirement for one or more of these properties for the class of aggregate tested, that property does not need to be tested.

4. The average of the three samples shall be considered representative of the entire lot.

G. Density and Moisture:

1. The density and moisture content of the surface course shall be tested a minimum of once every 200 SY.

2. Unless otherwise noted on the Drawings or **SECTION 02 32 00 – GEOTECHNICAL INVESTIGATION**, the surface course shall be compacted to 98% of the maximum dry density with a moisture content of ±3% in accordance with ASTM D698.

END OF SECTION

PART 1 GENERAL

32.1.01 DESCRIPTION

A. The work covered under this Specification shall include all concrete sidewalks, driveway approaches, and all work included thereto, as shown on the Plans and as specified herein.

32.1.02 REFERENCES

A. Reserved.

32.1.03 RELATED WORK SPECIFIED ELSEWHERE

A. The following items of related work are specified and included in other sections of these Specifications:

SECTION 01 11 00	**SUMMARY OF WORK**
SECTION 01 22 19	**MEASUREMENT AND PAYMENT**
SECTION 01 33 00	**SUBMITTAL PROCEDURES**
SECTION 03 05 00	**COMMON WORK RESULTS FOR CONCRETE**
SECTION 32 05 00	**COMMON WORK RESULTS FOR EXTERIOR SITE IMPROVEMENTS**

32.1.04 SUBMITTALS

A. The Contractor shall submit product data for the following to the Engineer in accordance with **SECTION 01 33 00 – SUBMITTAL PROCEDURES:**

1. Concrete Mix Design
2. Expansion Joint Materials
3. Concrete Curing Compounds
4. Detectable Warning Panels

PART 2 PRODUCTS

32.2.01 CONCRETE

A. All concrete for pavements, driveways and walks shall be of the 400-psi class as specified in **SECTION 03 30 00 – CAST-IN-PLACE CONCRETE.**

32.2.02 EXPANSION JOINT MATERIALS

A. Expansion joint materials shall conform to the requirements of **SECTION 03 15 00 – CONCRETE ACCESSORIES** of the Specifications.

32.2.03 CURING COMPOUNDS

A. Curing compound materials shall conform to the requirements of **SECTION 03 39 00 – CONCRETE CURING** of the Specifications.

32.2.04 DETECTABLE WARNING PANELS

A. The detectable warning panels shall have a minimum size of 1 foot by 2 feet.

B. The panels shall be safety yellow color throughout the panel and consist of a surface of truncated domes aligned in a square grid pattern.

C. The truncated domes shall be aligned on a square grid in the predominant direction of travel.

D. The truncated domes shall have a base diameter of 0.9-inches to 1.4-inches with a top diameter between 50 and 65 percent of the base diameter. The height of the truncated domes shall be 0.2-inches. The truncated domes shall have a center-to-center spacing of 1.6-inches to 2.4-inches and a base-to-base spacing of at least 0.65-inches measured between adjacent domes on the square grid.

PART 3 EXECUTION

32.3.01 CONCRETE SIDEWALKS

A. The sidewalk foundation shall be excavated, shaped and compacted in accordance with **SECTION 31 23 13 – SUBGRADE PREPARATION** to a firm, uniform bearing surface, conforming to the planned section and established grade.

1. Unsuitable subgrade soils shall be removed and replaced as specified herein.

2. Unless otherwise specified on the Drawings, a minimum of 6 inches granular material shall be furnished, placed and compacted thoroughly below the sidewalks. The granular material shall meet the requirements as specified in **SECTION 32 11 23 – AGGREGATE BASE COURSES** of these Specifications.

B. The concrete shall be placed in forms and consolidated without causing segregation.

1. The finished surface shall not vary more than 3/16-inch from a 10-foot straight edge and the formed edges shall not vary more than 1 inch from the required location.

C. Joints:

1. Joints in sidewalks shall divide the surface into panels of uniform size.

2. The panels shall be square where practical.

3. Joints shall be perpendicular to the finished surface.

4. Panels shall not have an area in excess of 36 square feet.

5. Joints shall all align with like joints in adjacent work unless the concrete is separated with no less than 1/2-inch of expansion joint filler material.

6. All joints and edges shall be rounded with a 1/2-inch radius-edging tool.

D. Expansion joints:

1. Expansion joints shall be a minimum of 1/2-inch thickness.

2. Expansion joint material shall extend the full width and depth of the concrete.

3. Traverse expansion joints shall be placed at driveways and at a minimum spacing of 50 feet.

4. Longitudinal expansion joints shall be placed as shown in the Drawings.

5. Expansion joints with filler material shall also be placed at locations where the concrete surrounds or adjoins any existing fixed objects such as fire hydrants, building foundations, and other rigid structures.

E. Contraction joints:

1. Contraction joints shall be provided at five (5) foot intervals in sidewalk construction except as otherwise shown in the Plans.

2. Contraction joints shall extend to at least 1/4 the concrete thickness and shall be approximately 1/8-inch wide.

F. All exposed surfaces of concrete pavements, walks and driveways shall receive a broomed finish as specified in **SECTION 03 35 00 – CONCRETE FINISHING** of these Specifications.

G. All exposed surfaces of concrete pavements, walks and driveways shall be cured with a liquid curing compound as specified in **SECTION 03 39 00 – CONCRETE CURING** of these Specifications.

32.3.02 BACKFILLING

A. Backfill shall be placed along the edges of completed sidewalks in a manner that will not cause displacement of the section nor damage to the exposed edges.

B. All damaged sidewalk shall be replaced at the direction of the Owner's Representative at the Contractor's expense.

32.3.03 TESTING

A. Testing of the sidewalks shall be in accordance with **SECTION 03 05 00 – COMMON WORK RESULTS FOR CONCRETE** of these Specifications.

32.3.04 FINISHING

A. Finishing of the sidewalks shall be in accordance with **SECTION 03 35 00 – CONCRETE FINISHING** of these Specifications.

END OF SECTION

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PART 1 GENERAL

32.1.01 DESCRIPTION

The work covered under this Section of the Project Manual includes painted markings applied to asphalt or concrete pavement, and all work incidental thereto, as shown on the Drawings and as specified herein.

32.1.02 RELATED WORK SPECIFIED ELSEWHERE

The following items of related work are specified and included in other sections of this Project Manual:

SECTION 09 09 13 EXTERIOR PAINTING
SECTION 09 91 23 INTERIOR PAINTING

32.1.03 PREINSTALLATION MEETINGS

A. Conduct a preinstallation meeting on job site. Review methods and procedures related to marking pavement including, but not limited to, the following:

1. Pavement aging period before application of pavement markings.
2. Review requirements for protecting pavement markings, including restriction of traffic during installation period.

32.1.04 SUBMITTALS

A. Product Data: For each type of product

1. Include technical data and tested physical and performance properties.

B. Shop Drawings:

1. Indicate pavement markings, colors, lane separations, defined parking spaces, and dimensions to adjacent work.
2. Indicate, with international symbol of accessibility, spaces allocated for people with disabilities.

C. Samples: For each exposed product and for each color and texture specified; on rigid backing, eight inches square.

D. All requirements for materials and workmanship shall follow section 762 of the 2008 NDDOT Standard Specifications for Road and Bridge Construction.

PART 2 PRODUCTS

32.2.01 PAVEMENT MARKING PAINT

Construction requirements shall follow section 880 of the 2008 NDDOT Standard Specifications for Road and Bridge Construction.

PART 3 CONSTRUCTION REQUIREMENTS

32.3.01 PAVEMENT MARKINGS

Construction requirements shall follow section 762.04 of the 2008 NDDOT Standard Specifications for Road and Bridge Construction.

END OF SECTION

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PART 1 GENERAL

32.1.01 DESCRIPTION

A. This Specification includes fencing, gates, signage and all work incidental thereto as shown on the Plans and as specified herein for the furnishing and installation of chain link fences and gates.

32.1.02 REFERENCES

A. The following documents form a part of this Specification to the extent stated herein and will be the latest editions thereof. Where differences exist between codes and standards, the requirements of these Specifications will apply.

B. Standards

ASTM A123	Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products
ASTM A392	Standard Specification for Zinc-Coated Steel Chain-Link Fence Fabric
ASTM A491	Standard Specification for Aluminum-Coated Steel Chain-Link Fence Fabric

32.1.03 RELATED WORK SPECIFIED ELSEWHERE

A. The following items of related work are specified and included in other sections of these Specifications:

SECTION 01 11 00 SUMMARY OF WORK
SECTION 01 22 19 MEASUREMENT AND PAYMENT
SECTION 01 33 00 SUBMITTAL PROCEDURES
SECTION 32 05 00 COMMON WORK RESULTS FOR EXTERIOR IMPROVEMENTS

32.1.04 SUBMITTALS

A. Shop drawings shall be submitted for the equipment furnished in accordance with section **01 33 00 – SUBMITTAL PROCEDURES** of these Specifications.

32.1.05 QUALITY ASSURANCE

A. Materials and equipment specified herein are intended to establish a standard for the necessary and desired type of chain link fence. Products of another manufacturer will be considered if, in the opinion of the Engineer, those products meet or exceed the type and quality of the specified equipment.

PART 2 PRODUCTS

32.2.01 FABRIC

A. The fabric for chain link fence shall be of Number 9 ASW gauge steel wire with a two (2) inch mesh.

B. The minimum tensile strength shall be 80,000 psi.

C. The fabric shall be either aluminum coated in conformance with the standards and specifications of ASTM A491 or zinc coated (2 ounces/square foot) in conformance with the standards and specifications of ASTM A392.

D. The fabric shall be furnished in six (6) feet wide rolls and shall have a barbed top edge and a knuckled bottom edge unless noted otherwise.

32.2.02 BARBED WIRE

A. Barbed wire shall be two standard twisted Number 12½ ASW gauge galvanized steel wire with four point barbs of galvanized steel wire.

B. Three strands of barbed wire shall be installed along the top of the fence.

32.2.03 TENSION WIRE

A. The bottom tension wire shall be Number 7 ASW gauge steel wire with a minimum tensile strength of 80,000 psi.

B. The wire shall be either aluminum coated in conformance with the standards and specifications of ASTM A491 or zinc coated (2 ounces/square foot) in conformance with the standards and specifications of ASTM A392.

32.2.04 LINE, END CORNER AND GATE POSTS

A. Line, end, corner, and gate posts shall be galvanized Schedule 40 pipe of sufficient length to meet the embedment requirements and height of the fence shall meet or exceed the minimum size shown in the Drawings and be in conformance with the fence manufacturer's recommendations.

B. Line, end, corner, and gate posts shall have a zinc coating of two (2) ounces per square foot in conformance with the standards and specifications of ASTM A123 and A392.

32.2.05 TOP AND BRACE RAILS

A. Top and brace rails shall be galvanized Schedule 40 pipe.

B. Top and brace rails shall have a zinc coating of two (2) ounces per square foot in conformance with the standards and specifications of ASTM A123 and A392.

32.2.06 GATES

A. Frames for gates shall be galvanized Schedule 40 pipe of sufficient length to meet the embedment requirements and height of the fence shall meet or exceed the minimum size shown in the Drawings and be in conformance with fence manufacturer's recommendations.

B. Sliding gates shall be a roller type gate with rollers on the bottom.

C. Gates shall have a positive latching device with padlock provisions.

1. A chain and lock is not acceptable

D. Gates shall have a zinc coating of two (2) ounces per square foot in conformance with the standards and specifications of ASTM A392.

32.2.07 EXTENSION ARMS

A. Extension arms on intermediate posts shall be manufactured from pressed steel.

B. The extension arms shall be hot dip galvanized after fabrication.

C. Extension arms on end and corner posts shall be manufactured from malleable iron.

D. The extension arms shall be hot dipped galvanized after fabrication.

E. The extension arms shall hold 3 strands of barbed wire.

F. The top most barbed wire shall be 12 inches above the top of the fence and outward from the fence at an angle of 45 degrees.

G. The arms shall be capable of supporting a minimum vertical load of 250 lbs.

32.2.08 FITTINGS

A. Fittings shall be fabricated of malleable iron.

B. The fittings shall be hot dip galvanized after fabrication. Caps shall be furnished on all corner posts, end posts and pipe gate stiles.

32.2.09 TIES

Tie wires shall be minimum Number 9 gauge aluminum wire.

32.2.10 CONCRETE

Concrete shall be Class B concrete as specified in **SECTION 03 30 00 – CAST-IN-PLACE CONCRETE**.

PART 3 EXECUTION

32.3.01 GENERAL

A. The site of the fence shall be cleared of all obstructions and surface irregularities.

B. All posts shall be set true to line and grade and shall be set plumb.

C. All line posts shall be either:

1. Set in concrete at least 3 feet deep and a minimum diameter of 10 inches.

2. Driven 4 feet

D. Line posts shall be placed at uniform intervals not to exceed 10 feet.

E. End posts, gate posts and corner posts shall be either:

1. Set in concrete at least 4 feet deep and 12 inches in diameter.

2. Driven 4 feet

F. End, corner, pull, and gate posts shall be braced with materials similar to the top rail.

G. The braces shall truss the end, corner and gate posts to the line posts.

H. Rods 3/8 inch in diameter, galvanized shall be used for this purpose.

I. The fabric shall be tightly stretched and neatly secured to the posts and rails.

J. Ties shall be spaced at 24 inch intervals along the top, center and bottom rails and at 12 inch intervals on all posts.

K. All field cut components of the fence which are galvanized shall be recoated with cold galvanizing.

L. Cold galvanizing shall be applied to all areas where handling and erection has damaged the factory applied coating.

32.3.02 CONNECTION TO EXISTING FENCES

A. Where new fencing is to be installed as an extension of existing fencing, the new fencing shall match the old, as close as is practical in terms of construction and materials, subject to the Engineer's approval.

B. The panels of the new and existing fence where the two adjoin shall be braced panels.

C. The Contractor shall furnish and install the bracing components for the existing fence if the existing panel is not braced.

D. The cost of furnishing and installing the bracing on the existing fence shall be included in the price bid for the new chain link fence and no additional compensation will be made therefor.

END OF SECTION

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PART 1 GENERAL

32.1.01 DESCRIPTION

A. The work covered under this Specification includes all seeding, sodding, fertilizer, erosion control blankets, and all work included thereto as shown on the Drawings and specified herein.

32.1.02 REFERENCES

A. Reserved.

32.1.03 RELATED WORK SPECIFIED ELSEWHERE

1. The following items of related work are specified and included in other sections of these Specifications:

SECTION 01 11 00	**SUMMARY OF WORK**
SECTION 01 22 19	**MEASUREMENT AND PAYMENT**
SECTION 01 33 00	**SUBMITTAL PROCEDURES**
SECTION 31 05 00	**COMMON WORK RESULTS FOR EARTHWORK**
SECTION 32 05 00	**COMMON WORK RESULTS FOR EXTERIOR SITE IMPROVEMENTS**

32.1.04 SUBMITTALS

A. The Contractor shall submit product data for the following to the Engineer in accordance with **SECTION 01 33 00 – SUBMITTAL PROCEDURES**:

1. Fertilizer
2. Seed Mixture
3. Mulch
4. Sod description and harvest location

PART 2 PRODUCTS

32.2.01 SEED MIXTURE

A. Pre-approved seed mixture types and application rates are shown in **SCHEDULE 32 92 00 - A**.

32.2.02 SEED

A. Seed and seeding mixtures shall be free of all prohibited noxious weed seed and shall not contain more than five-tenths (0.5%) percent by weight of restricted noxious weed seeds.

B. If seed with the specified percentage of pure live seed cannot be obtained, additional seed may be used to bring the amount of live seed up to the amount specified.

C. Seed which has become wet, moldy, or otherwise damaged in transit or storage will not be acceptable.

D. **Technical Provisions**

1. Reserved.

2. Prohibited and restricted noxious weeds shall be those classified by the North Dakota State Seed Department. **(ND)**

3. All seed containers shall be sealed and labeled to comply with existing North Dakota State Seed Rules and Regulations or in accordance with U.S. Department of Agriculture Rules and Regulations under the Federal Seed Act, if shipped in Interstate Commerce. **(ND)**

32.2.03 SOD

A. Sod furnished by the Contractor shall have a good cover of living or growing grass. This shall be interpreted to include grass that is seasonally dormant during the cold or dry seasons and capable of renewing growth after the dormant period. All sod shall be obtained from areas where the soil is reasonably fertile and contains a high percentage of loamy topsoil. Sod shall be cut or stripped

from living, thickly matted turf relatively free of weeds or other undesirable foreign plants, large stones, roots, or other materials which might be detrimental to the development of the sod or to future maintenance. Any vegetation more than 6 inches in height shall be mowed to a height of 3 inches or less before sod is lifted. Sod shall have a uniform thickness of at least 2 inches.

32.2.04 FERTILIZER

A. When the fertilizer is furnished in closed containers, they shall be clearly marked with the weight, type of nutrients, and the manufacturer's guaranteed analysis, all in accordance with State and Federal regulations.

B. When the fertilizer is furnished in bulk, each shipment shall be accompanied by a suitable bill-of-lading giving the weight, type of nutrients and a certificate of the manufacturer's guaranteed analysis.

32.2.05 MULCH MATERIAL

A. Mulch containing Canada thistle, leafy spurge fragments, or seeds shall be rejected.

B. The material shall be in an air-dry condition at the time of delivery.

PART 3 EXECUTION

32.3.01 GENERAL

A. With the exception of agricultural tilled areas, areas to receive paving, or other such surface improvements, all areas disturbed as a result of construction shall receive turf establishment in the form of seeding or sodding as shown on the Drawings or as directed by the Owner's Representative.

B. All areas not designated to be sodded shall be seeded.

C. Turf establishment shall be commenced as soon as practicable after completion of grading and topsoil operations in order to minimize the exposure of the topsoil to erosion.

D. The Contractor shall coordinate topsoiling and finishing work with turf establishment so that completed areas will be seeded, sodded, and mulched as required without delay before undesirable weed growth or soil erosion occurs.

32.3.02 SOIL PREPARATION

A. The Contractor shall place at least 6 inches of topsoil in all areas to be seeded or sodded.

B. Topsoil shall consist of loose, friable, loamy topsoil that is free of excess acid and alkali. It shall be free from objectionable amounts of sod, hard lumps, gravel, subsoil, or other undesirable material which will prevent the formation of a suitable seedbed. Topsoil shall, prior to being stripped, have demonstrated by the occurrence upon it of healthy crops, grass or other vegetable growth that is of good quality, and that is reasonably well drained.

C. The soil for fill and topsoiling of areas to be repaired shall be at least of equal quality to that which exists in areas adjacent to the area to be repaired. The soil shall be relatively free from large stones, roots, stumps, or other materials that will interfere with subsequent sowing of seed, sodding, or mulching, and shall be approved by the Owner's Representative before being placed.

D. Immediately prior to seeding or placing sod, the topsoil shall be loosened to a depth of no less than 4 inches.

E. On slopes, the cultivating equipment shall be operated in the general direction of right angles to the slopes.

F. All washed or eroded areas shall be backfilled before soil preparation is begun.

32.3.03 SEEDING

A. Seed shall be protected from moisture at all times.

B. Seeding shall be done from April 1 to June 1 or September 15 to November 1, except as otherwise allowed in writing by the Owner's Representative.

1. A preliminary certificate of substantial completion may be issued prior to seeding, assuming the balance of the project is substantially complete per the Owner's Representative. If a preliminary certificate of substantial completion is issued prior to the seasonal seeding date, time will not be counted against the contract during the required waiting period.

2. A final certificate of substantial completion may be issued upon completion of seeding.

C. Seeding shall be applied within 48 hours of the final seedbed conditioning.

D. The rate of application shall be adjusted as follows:

$$\text{Pounds Seed to be Sown} = \frac{\text{Pure Live Seed}}{\%\ \text{Germination} \times \%\ \text{Purity}}$$

E. The seed may be sown by means of a drill, broadcast seeding, or hydro-seeding.

F. Where broadcast seeding is used, the area shall be raked to incorporate the seed into the soil.

G. Seed shall not be sown into frozen ground or standing water.

H. Seed shall not be sown when the wind velocity exceeds 15 mph.

1. This requirement may be waived by the Owner's Representative when the Contractor can demonstrate that the seeding method used allows for acceptable placement and retention of the seed in the soil.

I. Fertilizer shall be applied to all seeded areas at the rate specified no more than 48 hours after the seed has been sown.

J. The seed bed shall be firmed by means of a drag or similar equipment immediately upon completion of the seeding and fertilizing.

32.3.04 MULCH AND ANCHORING

A. All areas that are seeded shall be mulched immediately after seeding when indicated on the drawings.

B. Mulch material shall be spread by mechanical means to provide a uniform distribution of the material.

C. The mulch application will be considered satisfactory when approximately 10 percent of the soil area is visible through the mulch material.

D. Areas of poor mulch distribution shall be corrected by the Contractor as directed by the Owner's Representative.

E. All mulch shall be anchored as necessary to ensure protection of seeding.

F. Mulch application and anchoring shall be undertaken as soon after seeding, fertilizing, and seedbed firming have been completed, as is practicable.

G. Areas where seed or mulch are lost due to wind, because of delay of mulching or anchoring shall be reseeded and remulched at the Contractor's expense.

H. The Contractor shall care for the mulched areas until final acceptance of the project. Such care shall consist of providing protection against traffic or other use by placing warning signs as approved by the Owner's Representative and erecting any barricades that may be necessary. The Contractor shall be required to repair or replace any mulching that is defective or becomes damaged until the project is finally accepted. When, in the judgment of the Owner's Representative, such defects or damages are the result of poor workmanship or failure to meet the requirements of the specifications, the cost of the necessary repairs or replacement shall be borne by the Contractor.

32.3.05 SODDING

A. The sod shall be cut with approved sod cutters to such a thickness that after it has been transported and placed on the prepared bed, but before it has been compacted, it shall have a uniform thickness of not less than 2 inches. Sod sections or strips shall be cut in uniform widths, not less than 10 inches, and in lengths of not less than 18 inches, but of such length as may be readily lifted without breaking, tearing, or loss of soil. Where strips are required, the sod must be rolled without damage with the grass folded inside. The Contractor may be required to mow high grass before cutting sod.

B. The sod shall be transplanted within 24 hours from the time it is stripped unless circumstances beyond the Contractor's control make storing necessary. In such cases, sod shall be stacked, kept moist, and protected from exposure to the air and sun and shall be kept from freezing. Sod shall be cut and moved only when the soil moisture conditions are such that favorable results can be expected. Where the soil is too dry, permission to cut sod may be granted only after it has been watered sufficiently to moisten the soil to the depth the sod is to be cut

C. Sodding shall be performed only during the seasons when satisfactory results can be expected. Frozen sod shall not be used, and sod shall not be placed upon frozen soil. Sod may be transplanted during periods of drought with the approval of the Owner's Representative, provided the sod bed is watered to moisten the soil to a depth of at least 4 inches immediately prior to laying the sod.

D. Sod shall be placed at all locations as designated on the Drawings.

E. The Contractor shall coordinate all preparations necessary for sodding well in advance of the arrival of the sod.

F. Sod provided by the Contractor shall be subject to approval by the Owner's Representative.

G. Sod placement shall commence immediately upon delivery of the sod.

H. The sod shall be moist and shall be placed on a moist earth bed. Pitchforks shall not be used to handle sod and dumping from vehicles shall not be permitted. The sod shall be carefully placed by hand, edge-to-edge and with staggered joints, in rows at right angles to the slopes, commencing at the base of the area to be sodded and working upward. The sod shall immediately be pressed firmly into contact with the sod bed by tamping or rolling with approved equipment to provide a true and even surface and ensure knitting without displacement of the sod or deformation of the surfaces of sodded areas. Where the sod may be displaced during sodding operations, the workmen when replacing it shall work from ladders or treated planks to prevent further displacement. Screened soil of good quality shall be used to fill all cracks between sods. The quantity of the fill soil shall not cause smothering of the grass. Where the grades are such that the flow of water will be from paved surfaces across sodded areas, the surface of the soil in the sod after compaction shall be set approximately 1 inch below the pavement edge. Where the flow will be over the sodded areas and onto the paved surfaces around manholes and inlets, the surface of the soil in the sod after compaction shall be placed flush with the pavement edges.

I. On slopes steeper than 3:1 and in V-Shaped or flat bottom ditches or gutters, the sod shall be pegged with wooden pegs not less than 12 inches in length and have a cross sectional area of not less than 3/4 square inch. The pegs shall be driven flush with the surface of the sod. Sodding shall begin at the base of all slopes.

J. No stretching of the sod strips shall be permitted.

K. Adequate water and watering equipment must be on hand before sodding begins, and sod shall be kept moist until it has become established, and its continued growth assured. In all cases, watering shall be done in a manner which will avoid erosion from the application of excessive quantities and will avoid damage to the furnished surface.

L. The newly placed sod shall be kept in good condition during the care period following placement. The care period after placement of the sod shall be 14 days duration for sod placed during the growing season before July 15th, and after September 15th; and shall be 21 days duration for sod placed between July 15th and September 15th.

M. The time between October 15th of any year and April 15th of the following year shall not be considered to be a part of the required care period for sod. Sod placed after October 15th of any year, or sod placed at a time when the care period for that sod extends past October 15th shall show evidence of established growth after April 15th of the following year before its care period will be considered concluded.

N. Water shall be applied to the sod during the care period according to the following schedule:

Immediately after sod placement	5 gals./sq. yd.
7 days after sod placement	5 gals./sq. yd.
14 days after sod placement	5 gals./sq. yd.

For sod placed between July 15th and September 15th, an additional 5 gallons per square yard shall be applied 21 days after sod placement.

O. Water shall be applied by sprinkling or any method approved by the Owner's Representative that prevents wasting the water by runoff from the sod area. If necessary to prevent runoff several hours of applications of the water may be required. The amount of water to be applied may be reduced by the Owner's Representative if in his opinion there has been enough rainfall to warrant a reduction.

P. The Contractor shall furnish and replace without any compensation any sod that dies or is damaged to the extent replacement is required during the care period. Replacement sod shall be installed under the same specification requirements as those for the original sod being replaced, including the care period.

Q. Water will be considered incidental to the item "Sodding".

R. All sodded areas shall be protected against traffic or other use by warning signs or barricades approved by the Owner's Representative.

S. The Contractor shall mow the sodded areas with approved mowing equipment, depending upon climatic and growth conditions and the needs for mowing specific areas. In the event that weeds, or other undesirable vegetation are permitted to grow to such an extent that, either cut or uncut, they threatened to smother the sodded species, they shall be mowed and the clippings raked and removed from the area.

T. When the surface has become gullied or otherwise damaged during the period covered by this contract, the affected areas shall be repaired to re-establish the grade and the condition of the soil, as directed by the Owner's Representative, and shall then be re-sodded.

32.3.06 MAINTENANCE

A. The Contractor shall be responsible for maintaining all areas that have been seeded or sodded until the time of final acceptance.

B. This shall include watering initially as required to establish the turf and as necessary to maintain the growth once it is established.

C. Maintenance shall also include providing protection against damage due to erosion or traffic.

32.3.07 REPAIR

A. If at any time before final acceptance, the seeded or sodded areas are damaged by erosion, traffic or other cause, the Contractor shall repair the damage.

B. The reseeding or resodding of damaged areas shall be done at the Contractor's expense.

SCHEDULE 32 92 00 - A

SEED MIXTURES

Class I (Pasture and Hay Land Areas)

Percent by Weight	Kind of Grass	Percent Pure Live Seed
40	Brome Grass	80
40	Crested Wheat Grass	80
20	Slender or Intermediate Wheat Grass	75
Plus Cover Crop		
Rate of Application = 40 Lb/Acre		

Class II (Lawn Areas)

Percent by Weight	Kind of Grass	Percent Pure Live Seed
60	Kentucky Blue Grass	80
30	Perennial Rye	80
10	Creeping Fescue	80
Rate of Application = 4-6 Lb/1,000 SF		

Class III (Level Areas)

Percent by Weight	Kind of Grass	Percent Pure Live Seed
100	Brome Grass	80
Plus Cover Crop		
Rate of Application = 4 Lb/Acre		

Class IV (For slopes 3:1 or more)

Percent by Weight	Kind of Grass	Percent Pure Live Seed
50	Brome Grass	80
50	Crested Wheat Grass	80
Plus Cover Crop		
Rate of Application = 40 Lb/Acre		

Class V (Saline Areas)

Percent by Weight	Kind of Grass	Percent Pure Live Seed
40	Fairway Crested Wheat Grass	80
20	Slender Wheat Grass	75
40	Western Wheat Grass	75
Plus Cover Crop		
Rate of Application = 20 Lb/Acre		

Class VI (Dense Nesting Cover)

Percent by Weight	Kind of Grass	Percent Pure Live Seed
35	Intermediate Wheat Grass	75
20	Slender Wheat Grass	75
35	Alfalfa	85
10	Mixed Sweet Clover	85
Plus Cover Crop		
Rate of Application = 10 Lb/Acre		

1. When Class V seed mixture is specified, 60 pounds of ammonium nitrate (33.5% Nitrogen) per acre shall be spread on the soil prior to seeding or by means of fertilizer attachment on the drill. Ammonium nitrate shall not be mixed with the seed.

2. When Class I, III, IV, V, or VI seed mixture is specified, 20 pounds of oats seed per acre shall be added to the mixture if seeding is performed before July 15th, and if seeding is performed after July 15th, 30 pounds of rye seed per acre shall be added to the mixture.

END OF SECTION

PART 1 GENERAL

33.1.01 DESCRIPTION

A. This Specification includes work common to water, sanitary sewer and storm water utilities and all work included thereto as shown on the Drawings and specified herein.

33.1.02 REFERENCES

A. The current publications listed below form a part of this Specification.

B. Standards

AWWA C105	Polyethylene Encasement for Ductile Iron Pipe Systems
AWWA C900	Polyvinyl Chloride (PVC) Pressure Pipe and Fabricated Fittings, 4 In. Through 60 In.

33.1.03 RELATED WORK SPECIFIED ELSEWHERE

A. The following items of related work are specified and included in other sections of these Specifications:

SECTION 01 11 00	**SUMMARY OF WORK**
SECTION 01 22 19	**MEASUREMENT AND PAYMENT**
SECTION 01 33 00	**SUBMITTAL PROCEDURES**
SECTION 33 41 00	**STORM UTILITY DRAINAGE PIPING**
SECTION 33 49 00	**STORM DRAINAGE STRUCTURES**

33.1.04 SUBMITTALS

A. Refer to Related Work sections for applicable submittals required in these Contract Documents if not included herein.

B. Shop drawings and product data shall be submitted for in accordance with **SECTION 01 33 00 – SUBMITTAL PROCEDURES** of these Specifications.

PART 2 PRODUCTS

33.2.01 GENERAL

A. Refer to Related Work sections for applicable tests required in these Contract Documents if not included herein.

33.2.02 CONCRETE

A. Concrete for pipe cradles and saddles shall be Strength Class 3,000 psi conforming to the requirements of **SECTION 03 31 00 – STRUCTURAL CONCRETE** of these Specifications.

33.2.03 POLYETHYLENE ENCASEMENT

A. Polyethylene encasement must comply with the requirements of AWWA C105.

B. Linear low-density polyethylene (LLDPE) shall have a film thickness of 8 mils.

C. High-density cross-laminated polyethylene (HDCLPE) shall have a minimum film thickness of 4 mils.

D. The film shall be furnished in tube form for installation on pipe and all pipe-shaped appurtenances such as bends, reducers, off-sets, etc.

33.2.04 INSULATION

A. Insulation boards must be extruded polystyrene. Minimum thermal resistance per inch at 75° F mean must be a minimum of 5.0. Compressive strength must be a minimum of 30 psi. Flexural strength must be a minimum of 50 psi.

B. Spray-on Insulation must be closed-cell spray polyurethane foam. Minimum thermal resistance per inch at 75° F mean shall be a minimum of 5.0. Compressive strength shall be a minimum of 30 psi. Flexural strength shall be a minimum of 50 psi.

PART 3 EXECUTION

33.3.01 GENERAL

A. Underground utilities shall be installed to the lines and grades shown on the Drawings and as specified herein.

B. Excavation and backfilling of utility trenches shall be in conformance with the provisions of **SECTION 31 23 33 – TRENCHING AND BACKFILLING** of these Specifications.

33.3.02 INSPECTION

A. The Contractor is responsible for all Contractor furnished material. The Contractor shall inspect all pipe, fittings, and appurtenances for damage and defects when the materials are unloaded.

B. The Contractor shall also inspect these materials when they are installed to detect any damage which may have occurred due to handling.

C. Particular attention shall be given to jointing surfaces.

D. All defective or damaged materials shall be promptly removed from the site by the Contractor. This includes material discovered to be damaged or defective before final acceptance of the work, or during the guarantee period.

33.3.03 EQUIPMENT

A. All equipment necessary and required for the proper construction of utilities shall be on the project in first class working condition and approved by the Engineer before construction is permitted to start.

B. The Contractor shall provide suitable lifting equipment to handle the unloading and placing of pipe used in this project into final position.

C. The Contractor shall provide hand tampers and pneumatic tampers to obtain the compaction of the pipe bedding and backfill as specified.

33.3.04 PIPE LAYING

A. Trench excavation and bedding preparation shall proceed ahead of pipe placement as will permit proper placement and joining of the pipe and fittings at the prescribed grade and alignment without unnecessary hindrance.

1. All foreign matter or dirt shall be removed from the inside of the pipe and fittings before they are lowered into position in the trench, and they shall be kept clean by approved means during and after laying.

2. The pipe materials shall be carefully lowered into laying position by the use of suitable restraining devices.

3. Under no circumstances shall the pipe be dropped or dumped into the trench.

B. At the time of pipe placement, the bedding conditions shall be such as to provide uniform and continuous support for the pipe between bell holes.

1. Bell holes shall be excavated as necessary to make the joint connections, but they shall be no larger than would be adequate to support the pipe throughout its length.

2. No pipe material shall be laid in water nor when the trench or bedding conditions are otherwise unsuitable or improper.

3. All pipes shall have a minimum of 4" of bedding material below the pipe.

C. When placement or handling precautions prove inadequate, in the Engineer's opinion, the Contractor shall provide and install suitable plugs or caps effectively closing the open ends of each pipe section before it is lowered into laying position, and they shall remain so covered until removal is necessary for connection of an adjoining unit.

D. As each length of bell and spigot pipe is placed in laying position, the spigot end shall be centered in the bell and the pipe forced home and brought to correct line and grade.

1. The pipe shall be secured in place with granular bedding material, which shall be thoroughly compacted by tamping around the pipe to a height of at least six (6) inches above its top.

2. Acceptable tamping techniques include hand tamping and use of hand operated mechanical tamping devices.

E. At all times when pipe laying is not in progress, including lunch breaks and overnight periods, all open ends of the pipe shall be closed by watertight plugs or other means approved by the Engineer.

1. If water is present in the trench, the seals shall remain in place until the trench is pumped completely dry.

F. When connecting to existing utilities, the Contractor shall take every precaution necessary to prevent dirt or debris from entering the existing lines.

33.3.05 ALIGNMENT AND LENGTHS

A. The cutting of pipe for inserting valves, fittings or closure pieces shall be done in a neat and workmanlike manner without damage to the pipe and so as to leave a smooth square-cut end.

1. Pipe shall be cut with approved mechanical cutters.

2. The electric-arc cutting method, using carbon or steel rod, will be approved for use on larger size ductile or gray pipe where mechanical cutters are not available.

3. Flame cutting will not be allowed under any conditions.

4. All rough edges shall be removed from the cut ends of pipe and, where rubber gasket joints are used, the outer edge shall be rounded or beveled by grinding or filing to produce a smooth fit.

B. Wherever it is necessary to deflect pipe from a straight line either in the vertical or horizontal plane, to avoid obstructions, plumb stems, or produce a long radius curve when permitted, the amount of deflection allowed at each joint shall not exceed the allowable limits for maintaining a satisfactory joint seal as given by manufacturer's recommendations for mechanical joints and push-on joints.

1. If the specified alignment requires angular deflections greater than recommended or allowed, the Contractor shall provide appropriate bends or shorter pipes such that the maximum angular deflection is not exceeded.

C. Connection and assembly of joints shall be accomplished during the setting, aligning, and fitting operations.

33.3.06 THRUST BLOCKING AND RESTRAINING DEVICES

A. All plugs, caps, tees, bends, valves, and other thrust points shall be provided with reaction backing, or movement shall be prevented by attachment of suitable restraining devices, in accordance with the requirements of the Drawings or specified herein.

B. In the absence of other specified requirements for reaction backing or restraining devices, the following provisions shall apply:

1. All horizontal bends exceeding 20 degrees deflection, and all caps, plugs, and branch tees shall be provided with concrete buttress blocking.

2. All vertical bends exceeding 20 degrees deflection shall be provided with concrete buttress blocking at the low points and with metal tie rod or strapping restraints at the high points.

3. Offset bends made with standard offset fittings need not be strapped or buttressed.

C. Hardwood blocking shall only be used as temporary reaction backing until acceptable permanent reaction blocking or restraining devices have been installed.

1. This temporary blocking shall be nominal 2-inch timber having an area equivalent to at least four times the area of the surface of the cap or plug it retrains.

D. Concrete buttresses shall be poured against firm, undisturbed ground and shall be formed in such a way that the joints will be kept free of concrete and remain accessible for repairs.

1. Minimum buttress dimensions shall be as shown on the Drawings.

E. Thrust blocking for reducers or fittings of different main line sizes must be sized for the larger main line thrust.

F. Mechanical restraint of fittings and hydrants is allowed in lieu of concrete thrust blocks. If restraint lengths are not indicated on the plans, calculations for required length of restraint shall be provided for all types of fittings and restraint devices used. Calculations provided using the manufacturer's software is acceptable for evidence of satisfactory joint restraint.

G. Where mechanical restraining systems are used, joint restraints must be installed per the manufacturer's requirements.

H. The cost for all necessary fittings, bands, tie rods, nuts, and washers, concrete and all labor and excavation required for installation of reaction restraints shall be included in the price bid for the fitting or pipe being restrained and no direct compensation provided therefor.

I. Restraining devices must be accompanied in tandem with appropriately sized thrust blocking.

33.3.07 POLYETHYLENE ENCASEMENT

A. All ductile iron and gray iron pipe, valves, valve boxes, fittings and appurtenances, shall be fully encased in polyethylene film in accordance with AWWA C105.

1. Sheet film shall be provided and used for encasing all odd-shaped appurtenances such as valves, tees, crosses, etc.

2. The polyethylene tubing shall be installed on the pipe prior to being lowered into the trench.

3. Tubing length shall be sufficient to provide a minimum overlap at all joints of one foot or more. After completing the pipe jointing and positioning the overlap material, the overlap shall be secured in place with adhesive tape wrapped circumferentially around the pipe not less than three turns.

B. After encasement, the circumferential slack in the tubing film shall be folded over at the top of the pipe to provide a snug fit along the barrel of the pipe.

1. The fold shall be held in place with adhesive tape applied at intervals of approximately three feet along the pipe length.

2. Any rips, punctures, or other damage to the tubing shall be repaired as they are detected. These repairs shall be made with adhesive tape and overlapping patches cut from sheet or tubing material.

C. At odd-shaped appurtenances such as gate valves, the tubing shall overlap the joint and be secured with tape, after which the appurtenant piece shall be wrapped with a flat film sheet or split length of tubing by passing the sheet under the appurtenance and bringing it up around the body.

1. Seams shall be made by bringing the edges together, folding over twice, and taping down. Wherever encasement is terminated, it shall extend for at least two feet beyond the joint area.

D. Openings in the tubing for branches, service taps, air valves and similar appurtenances shall be made by cutting an X-shaped slit and temporarily folding back the film.

1. After installing the appurtenance, the cut tabs shall be secured with tape and the encasement shall be completed as necessary for an odd-shaped appurtenance.

E. Polyethylene encasement shall not be installed below a point 6 inches above the drain outlet of hydrants.

1. The foundation material at the base of the hydrant shall be placed against the polyethylene to secure it in place.

33.3.08 JOINTS

A. Where connections are to be made to existing pipes, the Contractor shall verify the necessary dimensions required for all couplings and appurtenances.

B. No utility line shall be removed from service as may be necessary for making a connection until the proper measurements have been taken and the Contractor has verified that all necessary and properly sized fittings, valves and appurtenances are on hand.

C. All surfaces of the joints, including gaskets, shall be thoroughly cleaned to remove all oil, dirt, grit or other foreign matter before any joint lubricant is applied.

33.3.09 INSULATION

A. Insulation boards shall be installed whenever the water main, sewer main, water or sewer service, or force main passes within 2 feet beneath a storm sewer.

B. Insulation boards shall be installed above shallow-bury water main, sewer main, water or sewer service, force main, or otherwise shown on the plans or as directed by the Engineer.

C. Insulation boards shall be placed on a firm compacted and smooth base. Sand may be used to provide the base. Insulation boards shall be covered with a minimum of 2 inches of sand or other suitable granular base prior to any compaction or additional backfill is placed.

D. The insulation boards shall be placed in a stepped pattern so that joints are not continuous. Each layer shall be placed to cover the joints of the preceding layer. The upper joint shall be no closer than 6 inches from the lower joint. The insulation must extend a minimum of 4 feet beyond the outer walls of the storm sewer. In shallow-bury applications, the insulation must extend a minimum of 2 feet beyond the outer walls of the installed piping.

E. Underground structures that are identified on the Drawings to be insulated shall be insulated with a minimum 4" thick closed-cell spray polyurethane foam or extruded polystyrene boards a minimum of 6 feet down from finish ground elevation on the exterior walls, on the interior ceiling, and on the interior hatch/lid. Insulation on the exterior shall be secured by backfill. Interior board attachment to the ceiling shall be by galvanized concrete nails and washers, or self-tapping concrete screws. Boards shall be fastened on not less than a 12" x 24" grid. Fasteners shall have heads or washers at least 1" in diameter. Boards may be glued or bolted to the underside of the hatch.

33.3.10 RECORDS

A. The Contractor shall prepare and maintain an accurate record of encountered underground utility locations and depths.

B. Records shall include utility lines which are installed and those that are exposed during the course of work.

1. A table has been provided in **SCHEDULE 33 05 00 – A** at the end of this section for convenience. Contractor is responsible to supply necessary data as specified in this section.

C. The Contractor shall use references such as lot corners, building corners, manholes and other similar surface improvements or monuments.

D. Said records shall be submitted to the Owner's Representative upon completion of the work.

33.3.11 SEPARATIONS

A. Sanitary sewers and storm sewers must be laid at least 10 feet horizontally from any existing or proposed water main. The distance must be measured edge to edge.

B. Water mains must be laid at least 10 feet horizontally from any existing or proposed sanitary sewer main, sewer manhole, or storm sewer. The distance must be measured edge to edge.

C. If the proper horizontal separation as described above cannot be obtained, the sewer must be constructed with the following minimum conditions:

1. Sewers must be constructed of slip-on or mechanical joint pipe complying with public water supply design standards and be pressure tested to a minimum 150 psi for two hours to assure water tightness.

2. Sewer services utilizing in-line fittings must be installed and tested in the area of the encroachment. Saddles are not acceptable.

D. Sewer/water main crossings must be laid with a minimum vertical distance of 18 inches between the outside of the water main and the outside of the sewer. This must be the case where the water main is either above or below the sewer.

E. Sewer/water main crossings must be arranged so that the sewer joints will be equidistant and as far as possible from the water main joints.

F. Where a water main crosses under a sewer, adequate structural support must be provided for the sewer to maintain line and grade and to prevent damage to the water main.

G. If proper vertical separation as described above cannot be obtained, the sewer main must be constructed with the following minimum conditions:

1. Vertical separation at crossings between water and sewer mains must be at least 6 inches.

2. Sewers must be constructed of slip-on or mechanical joint pipe complying with public water supply design standards and be pressure tested to a minimum 150 psi for two hours to assure water tightness.

3. At crossings, one standard length of new pipe must be centered at approximately a 90-degree angle in respect to the existing pipe.

4. Sewer services utilizing in-line fittings must be installed and tested within 10 feet of the crossing. Saddles are not acceptable.

5. Either the water or sewer main must be encased in a watertight carrier pipe which extends 10 feet on both sides of the crossing or the mains must be encased in a minimum of 6 inches of flowable fill for a minimum of 10 feet each side of the crossing pipes.

6. If the minimum 6-inch separation is not viable, the water line must be relocated and vertical separation at crossings between water and sewer mains must be at least 18 inches.

33.3.12 UTILITY LINE DEPTH OF COVER

A. The depth of cover over utility lines is defined as the vertical distance as measured from top of pipe to finish grade elevation.

B. **Technical Provisions**

1. Reserved.

2. Depth of cover for water mains, services, and hydrant leads as specified in part A of this subsection will be as called out on the Drawings. When field adjustment to utility depth results

in a depth of cover of 7.5 feet or less, the utility must be furnished with insulation as specified herein. **(WILL_OFF)**

3. Depth of cover for sewer mains and services as specified in part A of this subsection will be as called out on the Drawings. When field adjustment to utility depth results in a depth of cover of six feet or less, the utility must be furnished with insulation as specified herein. **(WILL_OFF)**

33.3.13 EXISTING UTILITIES

A. The Contractor is fully responsible for liaison with utility companies and for repairing utilities damaged by him at no expense to the Owner. Utility mains in conflict shall be relocated by the Contractor or he shall make arrangements with the utility to perform the work.

B. Temporary support, adequate protection, and maintenance of all underground and surface structures, drains, sewers, water mains, home service connection for both sewer and water and other obstructions encountered in the progress of the work shall be furnished by the Contractor all at his own expense under the direction of the Engineer.

C. All utility lines that are cut or broken by the Contractor shall be repaired or replaced by the Contractor at his own expense.

33.3.14 CLEANUP

A. The Contractor shall maintain the work in a clean and orderly condition at all times.

B. All surplus materials, rubbish and debris shall be removed from the site.

C. In no instance shall it be permitted to dispose of any waste materials, rubbish, pallet materials or other debris in the backfill of utility trenches.

SCHEDULE 33 05 00 – A

UNDERGROUND UTILITY " AS BUILT DATA"

Station (Location)	Installed Utility	Installed Utility Depth (FT)	Exst. Utility Type Description (Type/Size)	Existing Utility Depth (FT)	Notes

END OF SECTION

PART 1 GENERAL

33.1.01 DESCRIPTION

A. This Specification includes the installation of all concrete manholes for stormwater and sanitary sewer applications including frames, covers, appurtenant equipment, and all work included thereto as shown on the Drawings and specified herein.

33.1.02 REFERENCES

A. The current publications listed below form a part of this Specification.

B. Standards

AASHTO H20	Load Rating
AASHTO M199	Standard Specification for Precast Reinforced Concrete Manhole Sections
ASTM A615	Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement
ASTM C443	Standard Specification for Joints for Concrete Pipe and Manholes, Using Rubber Gaskets
ASTM C478	Standard Specification for Circular Precast Reinforced Concrete Manhole Sections
ASTM C923	Standard Specification for Resilient Connectors between Reinforced Concrete Manhole Structures, Pipes, and Laterals
ASTM C1244	Standard Test Method for Concrete Sewer Manholes by the Negative Air Pressure (Vacuum) Test Prior to Backfill
ASTM D4101	Standard Classification System and Basis for Specification for Polypropylene Injection and Extrusion Materials

33.1.03 RELATED WORK SPECIFIED ELSEWHERE

A. The following items of related work are specified and included in other sections of these Specifications:

SECTION 01 11 00	**SUMMARY OF WORK**
SECTION 01 22 19	**MEASUREMENT AND PAYMENT**
SECTION 01 33 00	**SUBMITTAL PROCEDURES**
SECTION 03 05 00	**COMMON WORK RESULTS FOR CONCRETE**
SECTION 31 05 00	**COMMON WORK RESULTS FOR EARTHWORK**
SECTION 32 05 00	**COMMON WORK RESULTS FOR EXTERIOR IMPROVEMENTS**
SECTION 33 05 00	**COMMON WORK RESULTS FOR UTILITIES**
SECTION 33 41 00	**STORM UTILITY DRAINAGE PIPING**
SECTION 33 42 11.10	**STORMWATER GRAVITY PIPING**
SECTION 33 49 00	**STORM DRAINAGE STRUCTURES**

33.1.04 SUBMITTALS

A. Shop drawings and product data shall be submitted in accordance with **SECTION 01 33 00 – SUBMITTAL PROCEDURES** of these Specifications for all manhole materials, including:

1. Structures
2. Boots
3. Castings and Covers
4. Mortar
5. Steps
6. Coating
7. Gaskets
8. Adjustment Rings

PART 2 PRODUCTS

33.2.01 CONCRETE

A. Concrete bases, risers, top sections, and adjustment rings must be precast in accordance with **SECTION 03 40 00 – PRECAST CONCRETE.**

33.2.02 MORTAR

A. Mortar (non-shrink) shall be a combination of one part Portland Cement to two parts of sand by volume to which lime can be added not to exceed ten (10%) percent of cement by weight.

33.2.03 PRECAST REINFORCED CONCRETE PIPE MANHOLES

A. Precast Reinforced Concrete Manhole bases, risers, top sections, and adjustment rings shall conform to ASTM C478. The dimensions shall be as indicated in the plans and details.

B. **Technical Provisions**

1. Reserved.

2. Manhole top sections must be eccentric. **(WILL_OFF)**

33.2.04 CORROSION PROTECTION

A. One coat of polyurethane corrosion protection between 5 and 10 mils shall be spray-applied to the interior wall surface area for the full height of all installed sanitary sewer manholes.

B. **Technical Provisions**

1. Reserved.

33.2.05 MANHOLE STEPS

A. All Polypropylene Manhole Steps shall meet the requirements of ASTM C478 and AASHTO M199. Polypropylene shall conform to ASTM D4101. The 1/2" Grade 60 deformed reinforcing bar shall meet ASTM A615.

B. **Technical Provisions**

1. Reserved.

33.2.06 PIPE CONNECTIONS

A. Sanitary sewer pipe to manhole connections shall be through: 1) a flexible rubber boot, which shall be securely clamped with a stainless-steel locking expansion band into a pipe port; or, 2) a flexible rubber boot, which shall be cast into a pipe port; or, 3) a flexible rubber compression wedge, which shall be cast into a pipe port.

B. Neoprene rubber for manhole boots shall have a minimum thickness of 3/8-inch. Pipe clamp bands shall be stainless steel.

C. All sanitary sewer manhole connections shall meet the requirements of ASTM C923 and shall be installed with stainless steel locking mechanisms per the manufacturer's specifications

D. **Technical Provisions**

1. Reserved.

2. Manhole adapter for connections to existing sanitary sewer manholes must be:

a. GPK Sanded Manhole Adapter **(WILL_OFF)**

b. Or approved equal

33.2.07 CASTINGS AND COVERS

A. Manhole Castings and Covers shall be grey cast iron with a minimum clear opening of twenty-four inches with solid cover with two pick holes.

B. Covers shall meet requirements set forth in ASTM C478 and be designed for AASHTO H20.

C. **Technical Provisions**

1. Reserved.

2. Manhole frame and cover must be:

a. Neenah Foundry Company Number R-1733 **(WILL_OFF)**

b. Or approved equal

33.2.08 JOINT SEAL

A. Joints shall be rubber gasket and shall conform to ASTM C443.

PART 3 EXECUTION

33.3.01 GENERAL

A. All stormwater must be diverted to prevent entry into the sanitary sewer system both during and after construction.

33.3.02 CONNECTIONS TO EXISTING MANHOLES

A. When a pipe is connected to an existing manhole, a hole adequate to receive the new pipe shall be cut into the manhole.

B. If the existing manhole is of brick construction, a single rowlock of brick shall be turned over the new pipe and the existing manhole brickwork shall be cleaned, pointed and given a 1/2-inch mortar coat on the outside surface.

C. For connections to existing precast reinforced concrete sanitary sewer manholes, a hole shall be cored into the concrete manhole wall to receive the pipe. A sanded manhole adapter shall be inserted into the cored hole. Any voids in the concrete shall be firmly grouted with a non-shrinking material. The end product shall result in a water tight joint.

D. The bottom of the existing manhole shall be reconstructed to meet the new conditions.

E. Pipe connections to storm manholes must be fully grouted.

33.3.03 CONNECTIONS TO NEW MANHOLES

A. Pipe ports shall be blocked out or core-drilled at the point of manhole manufacture and shall be accurately located within 1/2-inch of proposed pipe centerline.

33.3.04 EXCAVATION

A. Excavation for manholes shall be done in a manner to provide adequate room for the construction of the item according to details as shown on the plans or stated in the specifications. When necessary the excavation shall be adequately shored or sheeted to ensure safe and satisfactory construction and backfilling.

B. Subgrade must be compacted as specified in **SECTION 31 05 00 – COMMON WORK RESULTS FOR EARTHWORK**.

33.3.05 AGGREGATE BASE COURSE

A. Crushed aggregate material must be installed and compacted at a minimum depth of 8" beneath the concrete base.

33.3.06 CONCRETE BASE

A. Bases shall extend a minimum of six (6) inches from the outside wall face or as indicated on the drawings.

B. Invert channels must be smooth and conform to the inside shape of the adjacent pipe sections. Changes in flow direction must be made with a smooth curve of as large a radius as the manhole size will permit. Changes in slope grade and size must be gradual.

C. The floor of the manhole outside of the channel must be smooth and slope toward the channel at a minimum of 4%.

D. The thickness and other dimensions of the base shall be as specified on the plans.

33.3.07 DROP MANHOLES

A. A drop manhole is defined as a manhole with an inlet invert elevation that is two feet or greater than the outlet invert elevation. Any manhole with an inlet/outlet elevation difference of less than two feet shall have the base channels formed with concrete to allow for uniform flow and minimal corrosive gas. Drop manholes will require a drop manhole connection constructed in accordance with the construction Drawings.

33.3.08 PLACING CASTINGS

A. Castings shall be set in full mortar beds. Castings shall be set accurately to correct elevation so that no subsequent adjustment will be needed. The maximum distance from the top of the precast reinforced concrete pipe manhole to the top of the casting shall be one and one-half (1½) feet. Building up shall be done with precast concrete manhole rings.

33.3.09 ADJUST RING FRAME AND CASTING

A. Adjusting Frames and Ring Castings in Paved Areas:

1. After completion of the bituminous base course, the Contractor shall uncover and raise all castings as specified.

2. The castings shall be set within 1/4 to 1/2 inch below the proposed finished grade of the street.

3. Aggregate base shall be placed around the casting to match the adjacent section and shall be compacted to the required density.

4. Final street surface course material shall then be placed and compacted flush with the adjacent wearing course.

5. The cost of the materials required for backfilling around the castings and/or water valve boxes shall be incidental to the contract and no direct compensation will be made therefor.

B. Adjusting Frame and Ring Castings in Areas with Aggregate Surfacing or Turf

1. In areas with aggregate surfacing, the top of casting shall be approximately 0.2 feet below the top of the surface.

2. In areas where there is turf around the casting, the casting shall be flush with the ground.

3. Adjusting castings of new manholes shall be considered incidental and no measurement will be made and no additional compensation will be made therefor.

33.3.10 BACKFILL

A. Backfill shall be deposited in horizontal layers not over twelve (12) inches in depth (loose) and each layer compacted, this process being repeated to the elevation of the finished grade as designated on the plans. Compaction shall be secured by watering each layer if dry (the water content of the material used shall not exceed the optimum moisture content) and tamping with approved mechanical rammers. The backfill shall be compacted to a density equal to the requirements specified for the pipe trench common to the manhole.

33.3.11 CLEANING

A. All manholes shall be thoroughly cleaned of any accumulations of silt, debris, or foreign matter of any kind, and shall be free from such accumulations at the time of the final inspection.

33.3.12 TESTING

A. All sanitary sewer manholes shall be air tested after backfilling has been completed and prior to acceptance by the Engineer. Testing shall be completed with all manhole bases, barrel and top sections. Air testing shall be done in accordance with ASTM C1244 and the following procedure:

1. The Contractor shall plug all pipe openings and secure and brace plugs and pipe;
2. The Contractor shall use a compression band to seal the base and vacuum and draw the vacuum to 10 inches Hg and start test;
3. The test duration will be determined using the minimum test times as contained Table 1 of ASTM C1244.
4. **Technical Provisions**

a. Reserved.

b. The test duration as specified in Part A.3 of this Subsection for all manholes that fall within the following depths and diameters will be determined as follows:

Manhole Diameter	Depth	Test Period
≤ 48"	≤ 12'	30 seconds
	12' – 24'	60 seconds
49" - 60"	≤ 12'	40 seconds
	12' – 24'	80 seconds
61" - 72"	≤ 12'	50 seconds
	12' – 24'	100 seconds

(WILL_OFF)

5. Record drop in pressure during test period; when air pressure has dropped more than 1-inch Hg during the test period, the manhole has failed; when pressure has not dropped more than 1-inch Hg during the test period the manhole is accepted.
6. Failed manholes shall be inspected for leak sources, repaired, and corrected by the Contractor prior to re-testing. All testing, re-testing, and repairs shall be completed by the Contractor at no expense to the Owner.

33.3.13 ABANDONING MANHOLES

A. The abandonment of manholes shall not occur until all existing sanitary sewer services have been transferred to another line.

B. The Contractor shall permanently plug all pipes entering and leaving the manhole. Plug shall consist of concrete or flowable fill extending a minimum of 18" into the pipe end.

C. The Contractor shall completely remove the manhole structure down to a minimum of four (4) feet below finished grade and fill and compact with an approved backfill sand or flowable fill.

D. All disturbed surface area shall be restored.

E. Removed material shall become the property of the Contractor and shall be disposed of at no additional cost to the Owner.

33.3.14 REMOVING MANHOLES

A. The removal of manholes shall not occur until all existing sanitary sewer services have been transferred to another line.

B. The Contractor shall completely remove the manhole structure in its entirety.

C. All pipes formerly connected to the manhole must be removed entirely, or the ends must be capped or plugged in a watertight fashion.

D. All disturbed surface area shall be restored.

E. Removed material shall become the property of the Contractor and shall be disposed of at no additional cost to the Owner.

END OF SECTION

PART 1 GENERAL

33.1.01 DESCRIPTION OF THE WORK

This Section of the Project Manual includes the installation of all storm sewer and culverts less than 48" Dia. and all appurtenances thereto as shown on the Drawings and specified herein.

33.1.02 RELATED WORK SPECIFIED ELSEWHERE

The following items of related work are specified and included in other Sections of this Project Manual:

SECTION 01 11 00 SUMMARY OF WORK
SECTION 01 33 00 SUBMITTAL PROCEDURES
SECTION 03 30 00 CAST-IN-PLACE CONCRETE
SECTION 31 23 00 EXCAVATION AND FILL
SECTION 31 23 33 TRENCHING AND BACKFILLING
SECTION 32 05 05 STANDARD PLATES
SECTION 33 49 00 STORM DRAINAGE STRUCTURES

33.1.03 SUBMITTALS

Shop Drawings shall be submitted for Pipe, Fittings, and Appurtenances.

PART 2 PRODUCTS

33.2.01 DRAINAGE PIPE

Drainage pipe and fittings for storm sewers and culverts shall be constructed of the materials as shown on the Drawings. The respective materials shall conform to the following:

A. Precast Concrete Pipes:

1. Precast concrete pipe for storm sewer applications shall be manufactured to meet the standards and specifications of ASTM C76 and ASTM C655.

    a. Conform to Standard Plate 3000L provided in **SECTION 32 05 05 STANDARD PLATES** of this Project Manual.

2. Joints for new pipes shall be gasketed.

    a. The joints and gaskets shall conform to ASTM C443 and ASTM C361.

    b. Conform to Standard Plate 3006G provided in **SECTION 32 05 05 STANDARD PLATES** of this Project Manual.

B. Joints for storm sewer and culvert extensions shall conform to the joint type of the existing pipe. The Contractor shall verify the type of existing pipe joints prior to the preparation of shop Drawings.

C. Concrete pipe shall be of the class required by the manufacturer for the cover loadings and bedding shown on the Drawings and specified herein.

D. Galvanized joint ties shall be furnished for each apron and the adjacent two sections of pipe so that the end three joints of a culvert or storm sewer shall be tied.

33.2.02 TRASH GUARDS

Galvanized trash guards shall be as shown on the Drawings.

PART 3 CONSTRUCTION REQUIREMENTS

33.3.01 GENERAL

A. Alignment

1. Underground utilities shall be installed to the lines and grades shown on the Drawings and as specified herein.

2. Excavation and backfilling of utility trenches shall be in conformance with the provisions of **SECTION 31 23 33 TRENCHING AND BACKFILLING** of this Project Manual.

3. All storm and sanitary sewer lines, culverts and aprons and water lines shall be bedded and encased in granular bedding as specified in S**ECTION 31 23 33 TRENCHING AND BACKFILLING** of this Project Manual.

B. Inspection

1. The Contractor shall inspect all pipe fittings and appurtenances for damage and defects when the materials are unloaded.

2. The Contractor shall also inspect these materials when they are installed to detect any damage which may have occurred due to handling.

3. Particular attention shall be given to jointing surfaces.

4. All defective or damaged materials shall be promptly removed from the site by the Contractor.

C. Pipe Laying

1. Trench excavation and bedding preparation shall proceed ahead of pipe placement as will permit proper placement and joining of the pipe and fittings at the prescribed grade and alignment without unnecessary hindrance.

   a. All foreign matter or dirt shall be removed from the inside of the pipe and fittings before they are lowered into position in the trench, and they shall be kept clean by approved means during and after laying.

   b. The pipe materials shall be carefully lowered into laying position by the use of suitable restraining devices.

   c. Under no circumstances shall the pipe be dropped or dumped into the trench.

2. At the time of pipe placement, the bedding conditions shall be such as to provide uniform and continuous-support for the pipe between bell holes.

   a. Bell holes shall be excavated as necessary to make the joint connections, but they shall be no larger than would be adequate to support the pipe throughout its length.

   b. No pipe material shall be laid in water nor when the trench or bedding conditions are otherwise unsuitable or improper.

3. When placement or handling precautions prove inadequate, in the Owner's Representative's opinion, the Contractor shall provide and install suitable plugs or caps effectively closing the open ends of each pipe section before it is lowered into laying position, and they shall remain so covered until removal is necessary for connection of an adjoining unit.

4. As each length of bell and spigot pipe is placed in laying position, the spigot end shall be centered in the bell and the pipe forced home and brought to correct line and grade.

   a. The pipe shall be secured in place with granular bedding material, which shall be thoroughly compacted by tamping around the pipe to a height of at least 12 inches above its top.

   b. Acceptable tamping techniques include hand tamping and use of hand operated mechanical tamping devices.

5. At all times when pipe laying is not in progress, including lunch breaks and overnight periods, all open ends of the pipe line shall be closed by watertight plugs or other means approved by the Owner's Representative.

   a. If water is present in the trench, the seals shall remain in place until the trench is pumped completely dry.

6. When connecting to existing utilities, the Contractor shall take every precaution necessary to prevent dirt or debris from entering the existing lines.

a. All work necessary to make the connection shall be included in the price bid for the storm utility drainage piping and no additional compensation shall be made therefor.

D. Alignment and Lengths

1. The cutting of pipe for inserting valves, fittings or closure pieces shall be done in a neat and workmanlike manner without damage to the pipe and so as to leave a smooth square-cut end.
2. Pipe shall be cut with approved mechanical cutters.
3. The maximum angular deflection at any joint for pipe materials and joints shall not exceed the manufacturer's recommendations.
4. If the specified alignment requires angular deflections greater than recommended or allowed, the Contractor shall provide appropriate bends or shorter pipes such that the maximum angular deflection is not exceeded.
5. Connection and assembly of joints shall be accomplished during the setting, aligning, and fitting operations.

E. Records

1. The Contractor shall prepare and maintain an accurate record of underground utility locations and depths.
2. This shall include utility lines which are installed and those that are exposed during the course of work.
3. The Contractor shall use references such as lot corners, building corners, manholes and other similar surface improvements or monuments.
4. Said records shall be submitted to the Owner upon completion of the work.

33.3.02 STORM SEWER AND CULVERT INSTALLATION

A. Storm sewer pipe and culverts shall be installed to the line and grade shown on the Drawings.

B. Apron sections and the last two pipe sections shall be tied together with galvanized tie rods.

C. The tie rods shall be installed on the interior of the pipe with the nuts outside.

END OF SECTION

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PART 1 GENERAL

33.1.01 DESCRIPTION

A. This Specification includes the installation of all fiberglass reinforced pipe storm sewer and all appurtenances thereto as shown on the Drawings and specified herein.

33.1.02 REFERENCES

A. The current publications listed below form a part of this Specification.

B. Standards

ASTM D3262 – Standard Specification for "Fiberglass" (Glass-Fiber-Reinforced Thermosetting-Resin) Sewer Pipe.
ASTM D4161 – Standard Specification for "Fiberglass" (Glass-Fiber-Reinforced Thermosetting-Resin) Pipe Joints using Flexible Elastomeric Seals.
ASTM D2412 – Standard Test Method for Determination of External Loading Characteristics of Plastic Pipe by Parallel-Plate Loading.
ASTM D3681 – Standard Test Method for Chemical Resistance of "Fiberglass" Pipe in a Deflected Condition.
ASTM D638 – Test Method for Tensile Properties of Plastics.

33.1.03 RELATED WORK SPECIFIED ELSEWHERE

A. The following items of related work are specified and included in other Sections of these Specifications:

SECTION 01 11 00 SUMMARY OF WORK
SECTION 01 22 19 MEASUREMENT AND PAYMENT
SECTION 01 33 00 SUBMITTAL PROCEDURES
SECTION 31 05 00 COMMON WORK RESULTS FOR EXTERIOR IMPROVEMENTS
SECTION 33 05 00 COMMON WORK RESULTS FOR UTILITIES

33.1.04 SUBMITTALS SECTION 33 05 11.1

A. Shop Drawings shall be submitted for Pipe, Fittings, and Appurtenances in accordance with **SECTION 01 33 00 – SUBMITTAL PROCEDURES** of these Specifications.

PART 2 PRODUCTS

33.2.01 GENERAL

A. Drainage pipe and fittings for storm sewers shall be constructed of the materials, types, and sizes as shown on the Drawings.

33.2.02 FIBERGLASS REINFORCED PIPE (FRP)

A. Pipe shall be of the class required by the manufacturer for the cover loadings and bedding shown on the Drawings and specified herein.

B. Fiberglass reinforced pipe for sewer applications shall be manufactured to meet the use for storm sewer.

C. Joints for storm sewer shall conform to the joint type of the pipe. The Contractor shall verify the type of pipe joints prior to the preparation of shop Drawings.

D. Joints must be soil-tight and silt-tight.

E. Galvanized joint connections may be used adjacent to end walls to be able to set insets into upstream bell joints.

F. Elastomeric Gaskets shall meet ASTM F477.

G. **Joints**. Unless otherwise specified, the pipe shall be field connected with fiberglass sleeve couplings that utilize elastomeric sealing gaskets as the sole means to maintain joint watertightness. The joints must meet the performance requirements of ASTM D4161. Joints at tie-ins, when needed, may utilize stainless steel gasket-sealed closure couplings.

H. **Fittings.** Flanges, elbows, reducers, tees, wyes, laterals and other fittings shall be capable of withstanding all operating conditions when installed. They may be contact molded or manufactured from mitered sections of pipe joined by glass fiber reinforced overlays.

I. Fiberglass Reinforced Pipes shall be as manufactured Hobas Pipe USA, Inc. or approved equal.

PART 3 EXECUTION

33.3.01 GENERAL

A. Refer to **SECTION 33 05 00 – COMMON WORK RESULTS FOR UTILITIES** of these Specifications for provisions common to utility construction.

B. Excavation and backfilling of utility trenches shall be in conformance with the provisions of **SECTION 31 23 33 – TRENCHING AND BACKFILLING** of these Specifications.

C. All Branch Fittings (lateral or vertical tees,) shall be encased in a concrete encasement to prevent the fitting from distorting. See detail in the Drawings.

D. All Connections, Installation Instructions by Manufacturer shall be followed.

E. Pipe shall be embedded in the Pipe Zone Embedment backfill materials and shall be coarse grained soils as called for by the Manufacturer instructions.

END OF SECTION

PART 1 GENERAL

33.1.01 DESCRIPTION

A. This Specification includes the installation of all sanitary manholes, catch basins, frames, covers, appurtenant equipment and all work included thereto as shown on the Drawings and specified herein.

33.1.02 REFERENCES

A. The current publications listed below form a part of this Specification.

B. Standards

ASTM A615	Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement
ASTM C443	Standard Specification for Joints for Concrete Pipe and Manholes, Using Rubber Gaskets
ASTM C478	Standard Specification for Circular Precast Reinforced Concrete Manhole Sections
ASTM C990	Standard Specification for Joints for Concrete Pipe, Manholes, and Precast Box Sections Using Preformed Flexible Joint Sealants
ASTM D4101	Standard Classification System and Basis for Specification for Polypropylene Injection and Extrusion Materials

33.1.03 RELATED WORK SPECIFIED ELSEWHERE

A. The following items of related work are specified and included in other sections of these Specifications:

SECTION 01 11 00	**SUMMARY OF WORK**
SECTION 01 22 19	**MEASUREMENT AND PAYMENT**
SECTION 01 33 00	**SUBMITTAL PROCEDURES**
SECTION 03 05 00	**COMMON WORK RESULTS FOR CONCRETE**
SECTION 31 05 00	**COMMON WORK RESULTS FOR EXTERIOR IMPROVEMENTS**
SECTION 33 05 00	**COMMON WORK RESULTS FOR UTILITIES**
SECTION 33 05 61	**CONCRETE MANHOLES**
SECTION 33 42 11	**STORMWATER GRAVITY PIPING**

33.1.04 SUBMITTALS

A. Shop drawings shall be submitted in accordance with **SECTION 01 33 00 – SUBMITTAL PROCEDURES** of these Specifications for all stormwater inlet materials, including:

1. Structures
2. Boots
3. Frames, Grates, and Covers
4. Mortar
5. Steps
6. Gaskets

PART 2 PRODUCTS

33.2.01 CONCRETE

A. Concrete shall be in accordance with **SECTION 03 05 00 – COMMON WORK RESULTS FOR CONCRETE**.

33.2.02 MORTAR

A. Mortar (non-shrink) shall be a combination of one part Portland Cement to two parts of sand by volume to which lime can be added not to exceed ten (10%) percent of cement by weight

33.2.03 PRECAST REINFORCED CONCRETE MANHOLES

A. Where Precast Reinforced Concrete Manholes are specified for drainage inlets, they must be constructed in accordance with **SECTION 33 05 61 – CONCRETE MANHOLES** of these Specifications, with grates/covers as shown on the Drawings.

33.2.04 PRECAST DRAINAGE CATCH BASIN

A. Dimensions and construction shall be as shown on Plans.

B. Grates and curb boxes be as shown on the Plans.

C. Structures with full depth of structure walls and a loose top slab shall not be considered acceptable.

PART 3 EXECUTION

33.3.01 CONNECTIONS

A. Pipe connections to storm manholes must be fully grouted.

B. All joints in drainage structures for storm sewers must provide a soil-tight and silt-tight seal.

1. Joints must include flexible joint sealant conforming to the requirements of ASTM C990 or a rubber gasket conforming to the requirements of ASTM C443.

33.3.02 ADJUST RING FRAME AND CASTING

A. Adjusting Frames and Ring Castings in Paved Areas

1. After completion of the bituminous base course, the Contractor shall uncover and raise all castings as specified.

2. The castings shall be set within 1/4 to 1 inch below the proposed finished grade of the street.

3. Aggregate base shall be placed around the casting to match the adjacent section and shall be compacted to the required density.

4. Final street surface course material shall then be placed and compacted flush with the adjacent wearing course.

5. The cost of the materials required for backfilling around the castings and/or water valve boxes shall be included in the bid price for the contract and no direct compensation will be made therefor.

B. Adjusting Frame and Ring Castings in Areas with Aggregate Surfacing or Turf

1. In areas with aggregate surfacing, the top of casting shall be approximately 3 to 6 inches below the top of the surface.

2. In areas where there is turf around the casing, the casing shall be flush with the ground.

C. Adjusting castings of new and existing drainage structures shall be considered part of the bid price and no measurement will be made and no additional compensation will be made therefor.

END OF SECTION

PART 1 GENERAL

33.1.01 DESCRIPTION

This section of the Project Manual includes the installation of all sanitary manholes, frames, covers, appurtenant equipment and all work included thereto as shown on the Drawings and specified herein.

33.1.02 RELATED WORK SPECIFIED ELSEWHERE

The following items of related work are specified and included in other sections of this Project Manual:

SECTION 01 11 00 SUMMARY OF WORK
SECTION 01 33 00 SUBMITTAL PROCEDURES
SECTION 03 30 00 CAST-IN-PLACE CONCRETE
SECTION 03 40 00 PRECAST CONCRETE
SECTION 31 23 33 TRENCHING AND BACKFILLING
SECTION 33 05 00 COMMON WORK RESULTS FOR UTILITIES
SECTION 33 41 00 STORM UTILITY DRAINAGE PIPING

33.1.03 SUBMITTALS

Shop drawings shall be submitted in accordance with **SECTION 01 33 00 SUBMITTAL PROCEDURES** of this Project Manual for:

A. Structures
B. Castings
C. Piping
D. Fittings

PART 2 PRODUCTS

33.2.01 CONCRETE

Concrete shall be in accordance with **03 30 00 CAST-IN-PLACE CONCRETE** or **SECTION 03 40 00 PRECAST CONCRETE**.

33.2.02 CONES

Drainage structures for storm sewers shall have eccentric cones

33.2.03 CASTINGS

Castings shall be of the type and design as indicated on the Drawings.

33.2.04 DRAINAGE STRUCTURE DESIGN 4021

A. Shall be as shown on drawings
B. Shall have Optional Steel Nosing
C. Structures with full depth of structure walls and a loose top slab shall not be considered acceptable.

PART 3 CONSTRUCTION REQUIREMENTS

33.3.01 CONNECTIONS

A. All connections of storm sewer pipes to drainage structures shall be made with a rubber boot.
    1. The boot shall be secured to the pipe and drainage structure with stainless steel clamps.
B. All joints in drainage structures for storm sewers shall be sealed with rubber gasket "O-rings".

33.3.02 ADJUST RING FRAME AND CASTING

A. Adjusting Frames and Ring Castings in Paved Areas

1. After completion of the bituminous base course, the Contractor shall uncover and raise all castings as specified.
2. The castings shall be set within 1/4 to 1/2 inch below the proposed finished grade of the street.
3. Aggregate base shall be placed around the casting to match the adjacent section and shall be compacted to the required density.
4. Final street surface course material shall then be placed and compacted flush with the adjacent wearing course.
5. The cost of the materials required for backfilling around the castings and/or water valve boxes shall be included in the bid price for the contract and no direct compensation will be made therefor.

B. Adjusting Frame and Ring Castings in Areas with Aggregate Surfacing or Turf

1. In areas with aggregate surfacing, the top of casting shall be approximately 0.2 feet below the top of the surface.
2. In areas where there is turf around the casing, the casing shall be flush with the ground.

C. Adjusting castings of new and existing drainage structures shall be considered part of the bid price and no measurement will be made and no additional compensation will be made therefor.

END OF SECTION

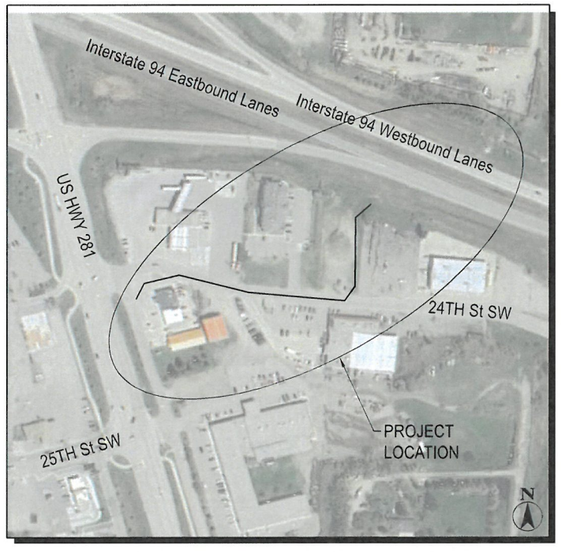
CONSTRUCTION PLANS
FOR
96" STORM SEWER REPLACEMENT PROJECT PHASE 2 SEGMENT II

PREPARED FOR
CITY OF JAMESTOWN
JAMESTOWN, NORTH DAKOTA

INDEX OF DRAWINGS		
SECTION NUMBER	SHEET NUMBER	SHEET TITLE
1	1	COVER SHEET
4	1-2	OVERVEIW
6	1-3	GENERAL NOTES
8	1	QUANTITIES
20	1-9	IE DETAILS
21	1-4	STRUCTURAL
40	1	REMOVALS
60	1-3	PLAN & PROFILE - STA 0+00 TO 16+10.78
76	1	TEMPORARY EROSION CONTROL LAYOUT
77	1	PERMANENT EROSION CONTROL LAYOUT
100	1-3	CONSTRUCTION SIGNAGE
D260	1	NDDOT SILT FENCE DETAILS
D261	1	NDDOT CURB & GUTTER AND VALLEY GUTTER DETAILS
D722	1-7	NDDOT STORM SEWER DETAILS
D748	1	NDDOT CURB & GUTTER AND VALLEY GUTTER DETAILS
D750	4	NDDOT CONCRETE DRIVEWAY AND SIDEWALK DETAILS
		THIS PLAN CONTAINS 43 SHEETS



LOCATION MAP
NOT TO SCALE



SITE MAP
NOT TO SCALE

APPROVED:

BY: _____
INTERSTATE ENGINEERING, INC.
PROJECT ENGINEER

DARRELL HOURMBUCKLE
REGISTERED
PROFESSIONAL
P.E. 3472
ENGINEER
NORTH DAKOTA
3/6/26

REVISION NO.	DATE	BY	DESCRIPTION

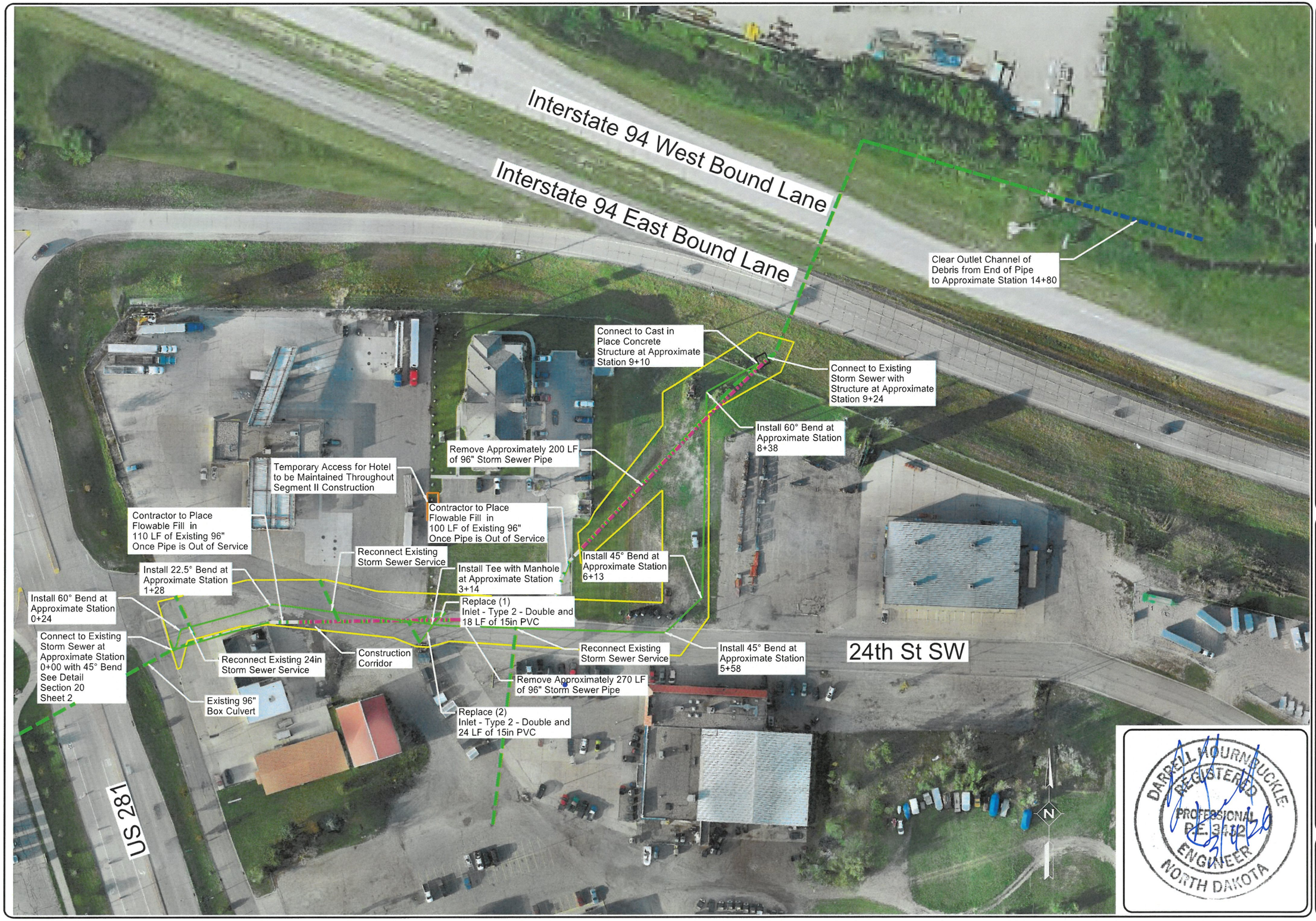
CITY OFFICIALS

MAYOR	DWAINE HENRICH
COUNCIL PERSON	PAM PHILLIPS
COUNCIL PERSON	BRIAN KAMLITZ
COUNCIL PERSON	DAVE SCHLOEGEL
COUNCIL PERSON	DAVE STEELE
CITY ADMINISTRATOR	SARAH HELLEKSON
PUBLIC WORKS DIRECTOR	TYLER MICHEL

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Rev No	Date	By	Description

96" Storm Sewer Replacement Project Phase 2 Segment II
City of Jamestown
Jamestown, North Dakota

Overview - Segment II

Drawn By:	JDH	Surveyed By:	PJ
Checked By:	JWS	Designed By:	DRH
		Project No:	EC23-00-100.01
		Date:	November 2025

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PE-3412
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NORTH DAKOTA

SECTION 4 SHEET 1

20.00' Water Easement (Doc. No. X83142)

Lot 5 of Second Replat

Lot Lines

West 85 Lot 4 of Second Replat

20.00' Sewer Easement (Doc. No. X18875)

Lot 1, Block 1, Bender's First Addition

40.00' Storm Sewer Easement (Doc. No. X109902) To Be Vacated Upon The Completion And Acceptance Of The New Storm Sewer Within The Easement Dedicated With This Plat By The City Of Jamestown, ND

Lot 3, Uncle Bob's Second Addition

Lot 2, Uncle Bob's Second Addition

50' Construction Corridor Boundary

Existing 96" Easement

New 96" STS Pipe

Existing 96" STS Pipe

Lot 1, Block 2, Dakota Inn Addition

24th St SW

Frontage Road

Lot 2, Block 2, Dakota Inn Addition

Lot 3, Block 2, Dakota Inn Addition

Lot 15, Block 2, Dakota Inn Addition

N

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Rev No	Date	By	Description

96" Storm Sewer Replacement Project Phase 2 Segment II
City of Jamestown
Jamestown, North Dakota

Project Segment Overview with Lot Lines and Names

Drawn By: JDH | Surveyed By: PJ | Project No: EC23-00-100.01
Checked By: TLD | Designed By: DRH | Date: November 2025

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SECTION 4 SHEET 2

General Notes

1. The existing Storm Sewer must remain operational in case of a water event. Contractor will be liable for maintaining this and responsible for any upkeep needed during a water event throughout the project. A water event is defined as any water entering the existing Storm Sewer Pipe. Including, but not limited to, a water main break, a rain event greater than 0.1 inch in 24 hours, any kind of disaster such as a flood, or other acts of God.

2. Unless otherwise noted, the existing 96" shall be removed and back filled with native soils or may be abandoned in place with flowable fill. See Detail Sheet D3. No filling of the existing pipe may not take place until a suitable, clear, path for the storm water is made.

3. Construction corridor for the project is FIFTY FEET (50') wide. The width is centered on the location of the new pipe. (25' each side) This was the guidelines for removals, replacements, and restoration pay items. Anything outside of this corridor damaged will not be paid without the approval of the Engineer.

4. Asphalt needing to be removed will be saw cut to ensure a clean edge.

5. Pipe sizes for the Reconnect Existing Storm Sewer Services were taken from best data available at the time of design. Actual pipe sizes and depths may vary. Contractor to field verify. Any changes in pipe sizes will not be permitted without the approval of the Engineer.

6. When ordering FRP pipe, note the lengths that are provided. It is not always in 20' increments.

7. For connections to NDDOT Existing Pipe, Project number for I 94 East Bound Reconstruction is IM-2-094(004)258. US 281 Drainage Structure Replacement Project number is AC-HPU-NHU-2-281(030)066. On site pictures of tie in locations in Section 6 Sheets 2-5 of these plans. Contractor to obtain the Agreement to Enter and any other permit needed to do work in the NDDOT Right of Way.

8. The 96" Storm Sewer Tee - FRP w/ Riser and Manhole Casting and Cover does not have an exact spot to be placed. The intent is to place the tee between the existing inlets that are getting replaced at a joint to avoid having to cut the 96" Pipe. The pipe entry holes in the riser from the inlets the may be best fit in the field.

9. The Cost of Removing and Replacing Approximately 60 LF of Chain Link Fence is considered incidental to the price per foot of the Pipe. The Contractor may reuse the fence and posts if it is carefully removed while placing the Pipe and Structure in the NDDOT ROW. If any significant damage is done, the Contractor will replace the damaged areas.

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NORTH DAKOTA
3/11/2026

Rev No	Date	By	Description

96" Storm Sewer Replacement Project Phase 2 Segment II
City of Jamestown
Jamestown, North Dakota

Project General Notes

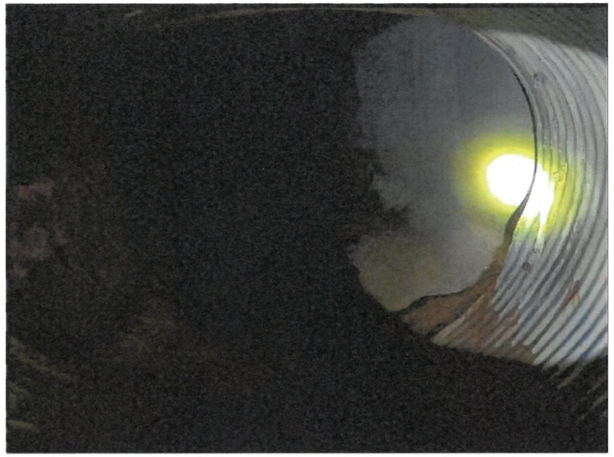
Drawn By: JDH | Surveyed By: PJ | Project No: EC23-00-100.01
Checked By: JWS | Designed By: DRH | Date: November 2025

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SECTION 6 SHEET 1

General Notes

Existing US 281 East Side Connection Point Pictures (Approximate Stationing 0+00)



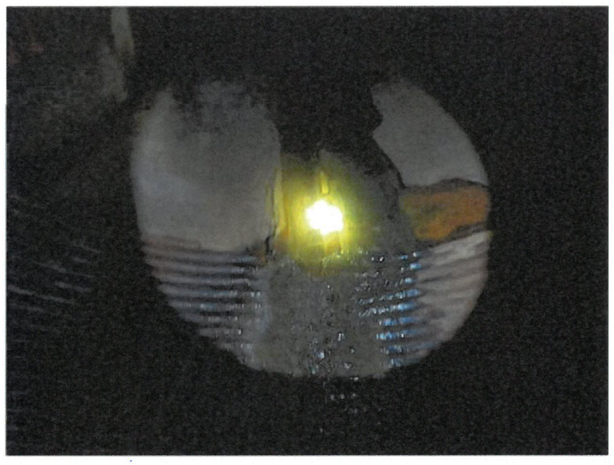
Pic 1



Pic 2



Pic 3



Pic 4

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ENGINEER
NORTH DAKOTA

Rev No.	Date	By	Description

96" Storm Sewer Replacement Project Phase 2 Segment II
City of Jamestown
Jamestown, North Dakota

Project General Notes

Drawn By: JDH | Surveyed By: PJ | Project No: EC23-00-100.01
Checked By: JWS | Designed By: DRH | Date: November 2025

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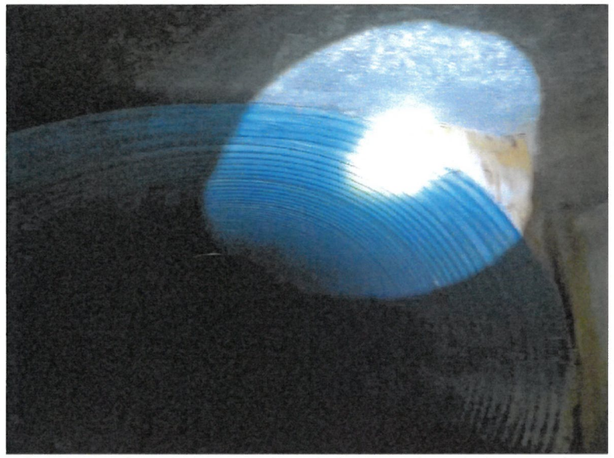
SECTION 6
SHEET 2

General Notes

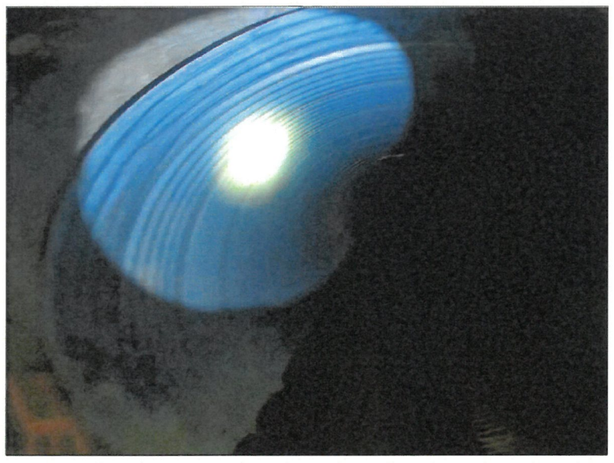
Existing I 94 South Side Connection Point Pictures (Approximate Stationing 9+24)



Pic 1



Pic 2



Pic 3



Pic 4

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P.E. 34522
ENGINEER
NORTH DAKOTA
3/9/26

Rev No.	Date	By	Description

96" Storm Sewer Replacement Project Phase 2 Segment II
City of Jamestown
Jamestown, North Dakota

Project General Notes

Drawn By: ___JDH___ Surveyed By: ___PJ___ Project No: EC23-00-100.01
Checked By: ___JWS___ Designed By: ___DRH___ Date: ___November 2025___

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SECTION 6
SHEET 3

PHASE 2 SEGMENT II

Item No.	Description	Unit	Quantity
1	96" Storm Sewer Pipe - Fiberglass Reinforced Polymer (FRP)	LF	910
2	22.5° Bend - FRP	EA	1
3	45° Bend - FRP	EA	3
4	60° Bend - FRP	EA	2
5	96" Storm Sewer Tee - FRP w/ Riser and Manhole Casting and Cover	EA	1
6	Wall Sleeve - FRP	EA	2
7	15 Inch Polyvinyl Chloride Storm Sewer Pipe	LF	45
8	Cast in Place Concrete Structure	EA	1
9	Replace (Quantity) Inlet - Type 2 - Double	EA	3
10	Reconnect Existing Storm Sewer Service	EA	3
11	Removal of Concrete Pavement	SY	690
12	Curb and Gutter Removal	LF	795
13	Curb and Gutter Replacement - Type I	LF	710
14	Curb and Gutter Mountable - Type I	LF	85
15	Removal of Asphalt Pavement	SY	1,270
16	Pavement Replacement - Asphalt Section 1	SY	1,270
17	Pavement Replacement - Concrete Section 2	SY	690
18	Flowable Fill	CY	390
19	Seeding Class I	Acre	0.60
20	General Requirements and Mobilization	LS	1
21	Testing - Allowance	LS	1
22	Traffic Control	LS	1
23	Removal of Existing 96" Storm Sewer Pipe	LS	1
24	Clearing Outlet Channel	LS	1
25	Temporary Access	LS	1

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Rev No	Date	By	Description

96" Storm Sewer Replacement Project Phase 2 Segment II
City of Jamestown
Jamestown, North Dakota

Quantities

Project No: EC23-00-100.01
Date: November 2025

Surveyed By: PJ
Designed By: DRH
Drawn By: JDH
Checked By: JWS

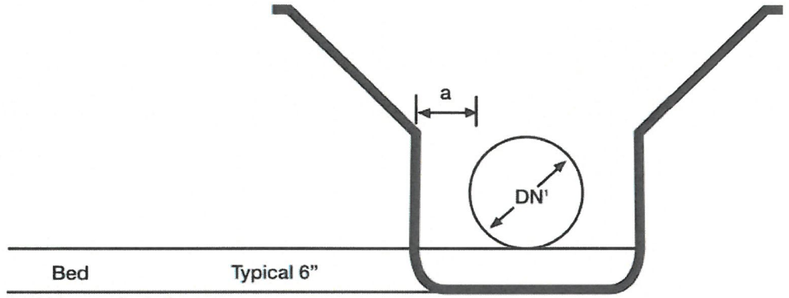
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SECTION 8 SHEET 1

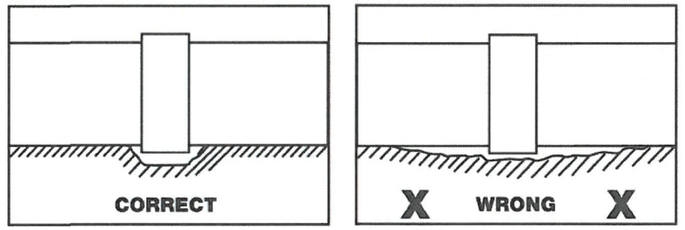
Details taken from Hobas Shop Drawings and are provided for reference.
Contractor to use this or for Hobas pipe or prior approved equal Manufacturer's Details.
See Division 33 of Specifications for Additional
Information.

DN (in.)	Typical Min. a (in.)	
	SPT[2] ≤ 8	SPT[2] > 8
18 to 20	6	4
24 to 33	9	6
36 to 48	12	8
51 to 72	18	12
78 to 126	24	16

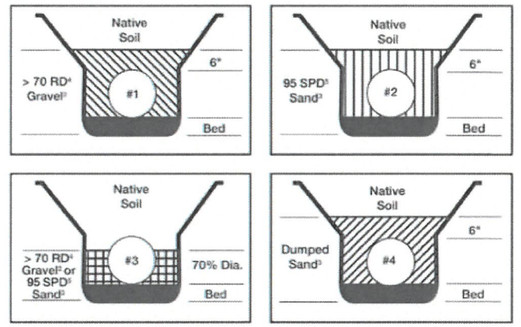


[1] DN is nominal diameter

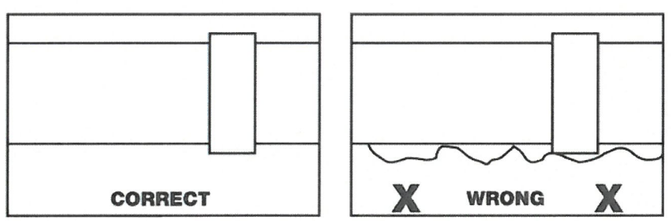
[2] Standard Penetration Test Blows/ft.per ASTM D1586

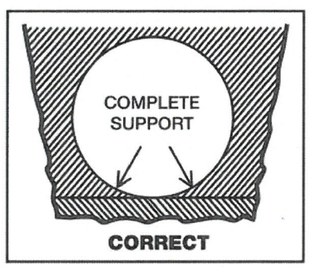


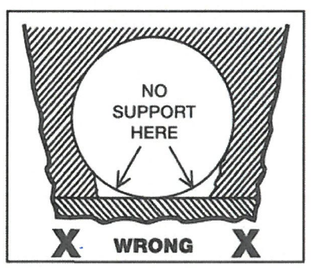
Note: After joint assembly, fill the bell holes with bedding material and compact as required.

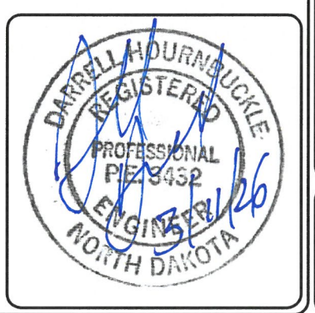


[2] Gravel is defined in section 14, paragraph A3
[3] Sand is defined in section 14, paragraph A3
[4] RD is relative density per ASTM D4253.
[5] SPD is standard proctor density per ASTM D698.









Rev No.	Date	By	Description

96” Storm Sewer Replacement Project Phase 2 Segment II
City of Jamestown
Jamestown, North Dakota

Hobas Pipe Installation Details

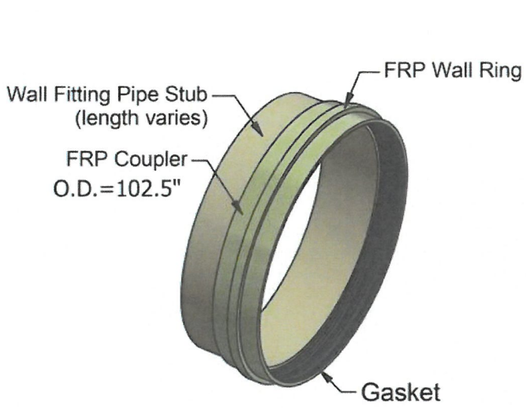
Surveyed By: JDH | Project No: EC23-00-100.01
Designed By: DRH | Date: November 2025
Drawn By: JDH
Checked By: TLD

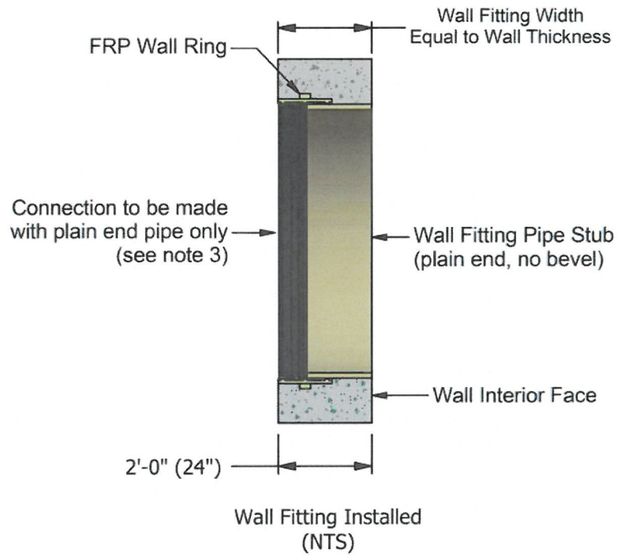
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SECTION 20
SHEET 1

Details taken from Hobas Shop Drawings and are provided for reference.
Contractor to use this or for Hobas pipe or prior approved equal Manufacturer's Details.
See Division 33 of Specifications for Additional Information.





Wall Fitting Installed
(NTS)

Notes:
1. See Hobas Pipe Section Data Sheet for additional information.
2. FRP Wall Ring is located at the center of the FRP Coupler.
3. For flush joint pipe, cut away flush joint and bevel plain end to make connection.
4. All fabricated dimensions are +/-0.25".

FWC Coupler:	96" Dia.
Connecting Pipe:	96" Dia, SN46, PN25
Fitting Width (out-out):	2'-0" (24")
FWC Wall Ring:	1"H x 2"W (Min.)

Project Name: Jamestown City Park Storm Repair
Project Location: Jamestown, North Dakota
Owner: City of Jamestown North Dakota

Contractor: Core & Main LP
Station: | Fitting Name:
Drawn By: T. Niebel | Part No.

Hobas Pipe USA, Inc.
1413 E. Richey Road
Houston, Texas 77073
281-821-2200
www.hobaspipe.com
HOBAS®

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Rev No.	Date	By	Description

96" Storm Sewer Replacement Project Phase 2 Segment II
City of Jamestown
Jamestown, North Dakota

Hobas Pipe Installation Details

Drawn By: JDH | Surveyed By: JDH | Project No: EC23-00-100.01
Checked By: TLD | Designed By: DRH | Date: November 2025

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SECTION 20
SHEET 2

Details taken from Hobas Shop Drawings and are provided for reference.
Contractor to use this or for Hobas pipe or prior approved equal Manufacturer's Details.
See Division 33 of Specifications for Additional Information.

Pre-Cast or Cast-in-place Manholes
HOBAS pipes can be easily connected by traditional methods to many pre-cast or cast-in-place concrete manholes as shown in Figures 6, 7, 8 and 9. Other methods may be suitable. Contact us for assistance.

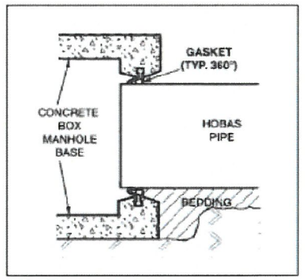


FIGURE 6 – Cast-in Gasket Connection

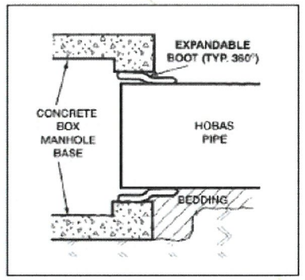


FIGURE 7 – Expandable Boot Seal Connection

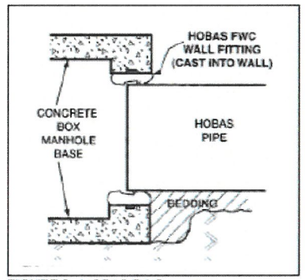


FIGURE 8 - HOBAS FWC Wall Fitting Connection

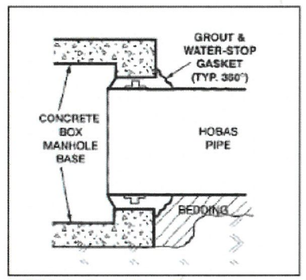
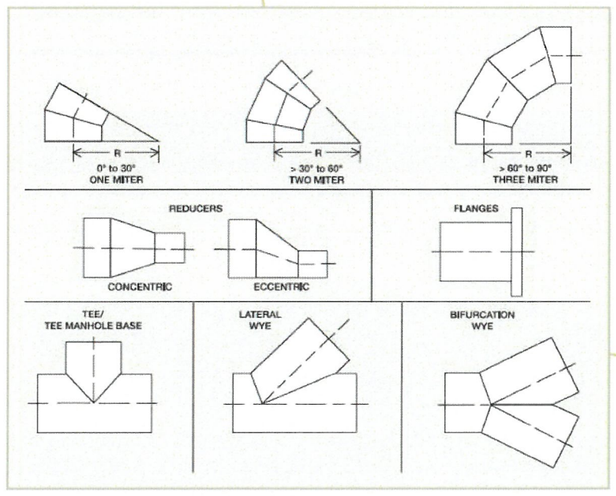
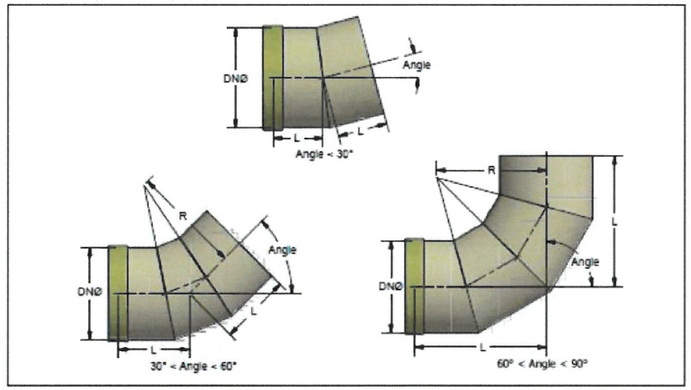


FIGURE 9 – Grout with Water-Stop Connection

* Such as A-Lok or Press-Seal Econoseal
** Such as Kor-N-Seal or Press-Seal PSX
*** In large diameters it may be best to utilize a rigid encasement adjacent to the structure.



E1 Fiberglass Elbows



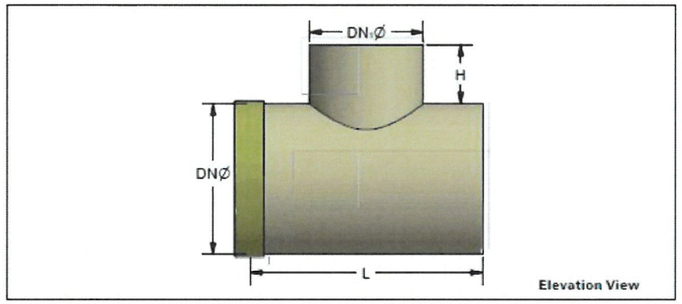
E1 Fiberglass Elbows

DN (in.)	R (in.)	L (in.) for ∝ 11 ¼°	22 ½°	30°	45°	60°	90°	P* (psi)
18	27	18	19	20	25	30	40	200
20	30	18	19	20	26	31	42	175
24	36	20	21	22	28	33	48	
27	38	20	21	22	29	34	50	
28	40	20	22	23	30	35	52	150
30	42	20	22	23	31	36	54	
33	44	20	22	24	32	37	56	
36	48	20	22	24	33	39	60	125
41	52	22	23	25	35	42	64	
42	54	23	25	25	37	43	66	
44	55	23	25	26	37	44	67	100
45	57	23	25	27	38	45	69	
48	60	25	25	27	39	46	72	
51	63	27	27	28	40	48	75	
54	66	28	28	28	41	49	78	
57	68	30	30	30	42	50	81	
60	70	31	31	31	43	51	84	
63	73	33	33	33	44	53	87	
66	75	34	34	34	45	54	90	
69	78	36	36	36	47	55	93	75
72	80	38	38	38	48	56	96	
78	84	41	41	41	51	60	102	
84	86	43	43	43	53	63	106	
85	90	44	44	44	54	64	108	
90	95	47	47	47	57	68	114	
96	100	50	50	50	60	72	120	
104	108	54	54	54	63	76	126	
110	112	57	57	57	66	80	132	
120	120	63	63	63	72	86	144	
126	126	66	66	66	72	86	144	50

Note 1: L may need to be increased if the design pressure exceeds P.

Note 2: Dimensions for other angles or different turning radii are available upon request.

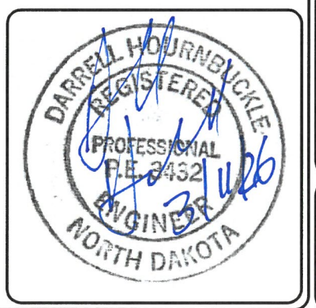
E2-A Fiberglass Manhole Tee Bases



E2-A Fiberglass Manhole Tee Bases

DN (in.)	DN1¹ (in.)	L (in.)	H (in.)	DN1¹ (in.)	L (in.)	H (in.)	DN1¹ (in.)	L (in.)	H (in.)
30	24	54	15	30	60	15	30	60	15
33	24	54	15	30	60	15	30	60	15
36	24	54	15	36	78	15	36	78	15
41	24	54	15	36	78	15	36	78	15
42	24	54	15	36	78	15	36	78	15
44	24	54	15	36	78	15	36	78	15
45	24	54	15	36	78	15	36	78	15
48	24	54	15	36	78	15	48	108	15
51	24	54	15	36	78	15	48	108	15
54	24	54	15	36	78	15	48	108	15
57	24	78	15	36	78	15	48	108	15
60	24	78	15	36	78	15	48	108	15
63	24	78	15	36	78	15	48	108	15
66	24	78	15	36	78	15	48	108	15
69	24	78	15	36	78	15	48	108	15
72	24	78	15	36	78	15	48	108	15
78	24	78	15	36	78	15	48	108	15
84	24	108	15	36	108	15	48	108	15
85	24	108	15	36	108	15	48	108	15
90	24	108	15	36	108	15	48	108	15
96	24	108	15	36	108	15	48	108	15
104	24	108	15	36	108	15	48	108	15
110	24	108	15	36	108	15	48	108	15
120	24	114	15	36	114	15	48	114	15
126	24	114	15	36	114	15	48	114	15

Notes:
1. Total lay length "L" shown above is typical for (DN1) branch diameter shown. Adjustment to "L" are available.
2. All tee bases to be concrete encased to prevent deformations. Concrete design by others.
3. Complete manhole design by others to include allowance for transfer of surface loads (HS-20) away from branch (DN1).
4. "H" dimension shown is typical, it can be adjusted to allow for specific encasement heights, service laterals, FRP riser connections with FWC couplings, etc.
5. Configurations shown (DN x DN1) can be adjusted to meet specific designs.
6. DN1 can change but must be less than or equal to DN for all tee base configurations.
7. Above dimensions are for straight thru (180 deg.) configurations. Tee bases with angles (PI's) are available, with increased L



Rev No.	Date	By	Description

96" Storm Sewer Replacement Project Phase 2 Segment II
City of Jamestown
Jamestown, North Dakota

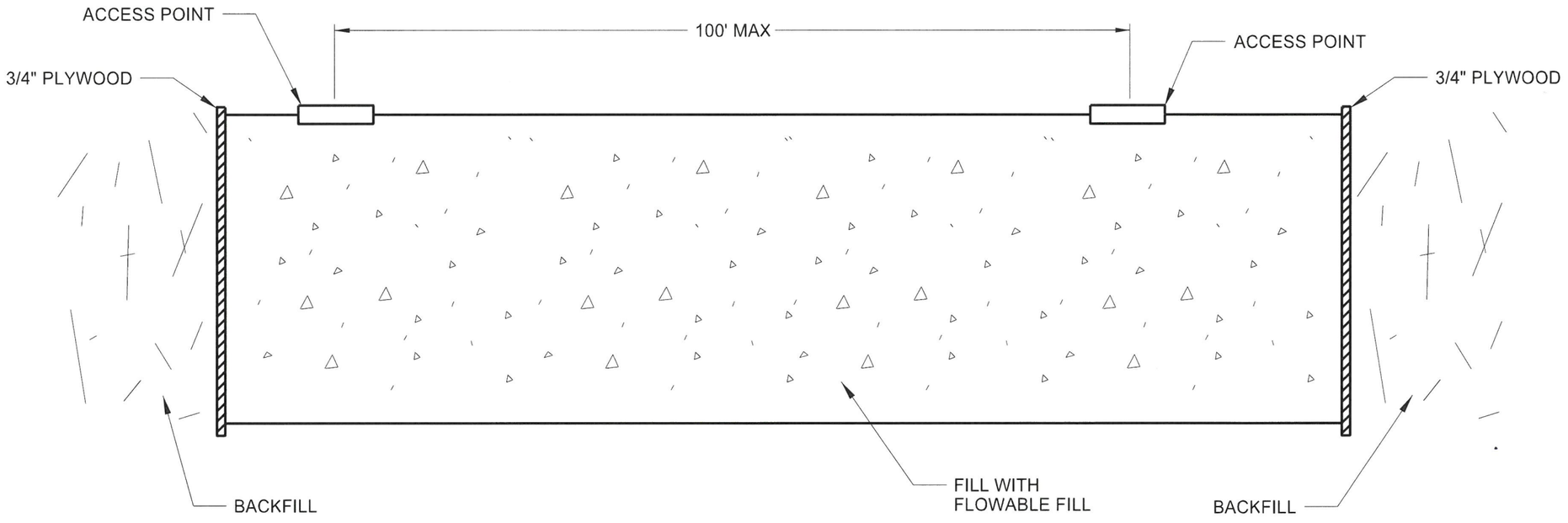
Hobas Pipe Installation Details

Drawn By: JDH | Surveyed By: JDH | Project No: EC23-00-100.01
Checked By: TLD | Designed By: DRH | Date: November 2025

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SECTION 20
SHEET 3



EXISTING 96" CMP ABANDONMENT

NOT TO SCALE

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ENGINEER
NORTH DAKOTA

Rev No.	Date	By	Description

96" Storm Sewer Replacement Project Phase 2 Segment II
City of Jamestown
Jamestown, North Dakota

Existing 96" CMP Abandonment Details

Drawn By: JDH | Surveyed By: JDH | Project No: EC23-00-100.01
Checked By: TLD | Designed By: DRH | Date: November 2025

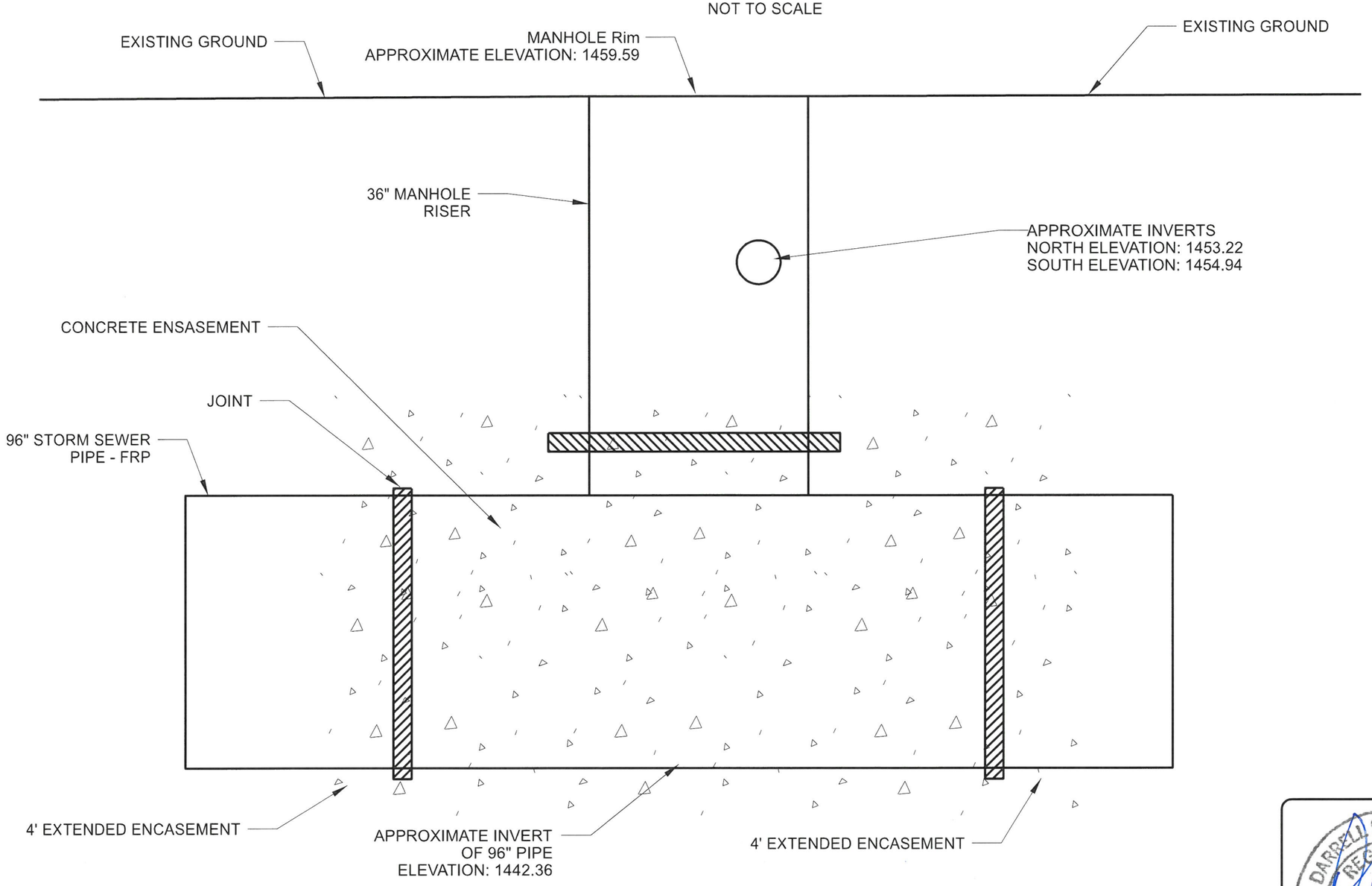
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SECTION 20
SHEET 4

96" X 36" STORM SEWER TEE - FRP w/ RISER AND TYPE I INLET

NOT TO SCALE



LUMP SUM BID ITEM NO. 4 96" X 36" STORM SEWER TEE -FRP w/ RISER AND MANHOLE CASTING AND COVER TO INCLUDE ALL LABOR AND MATERIALS INCLUDING BUT NOT LIMITED TO THE FOLLOWING:

1. 96" X 96" X 36" RFP STORM SEWER TEE
2. 36" RISER TO APPROXIMATE GRADE WHERE AJUSTMENT RINGS CAN BE USED WITH THE MAHHOLE COVER
3. 96" STORM SEWER TEE RFP SHALL BE ENCASED IN NO LESS THAN 13" OF CONCRETE UP TO A FOOT ABOVE 96" STS

DARRELL HOURNBUCKLE
REGISTERED
PROFESSIONAL
P.E. 8432
ENGINEER
NORTH DAKOTA
3/11/26

Rev No	Date	By	Description

96" Storm Sewer Replacement Project Phase 2 Segment II
City of Jamestown
Jamestown, North Dakota

Storm Sewer Tee - FRP with Riser Detail

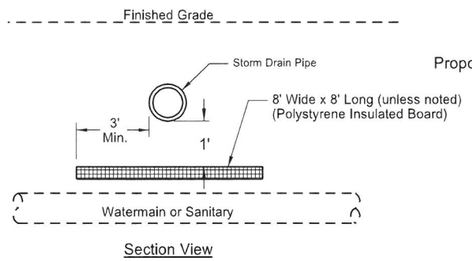
Surveyed By: JDH | Project No: EC23-00-100.01
Designed By: DRH | Date: November 2025
Drawn By: JDH
Checked By: TLD

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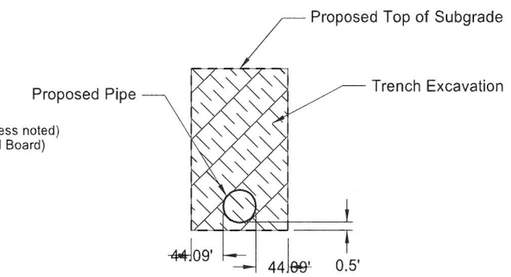
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SECTION 20
SHEET 5

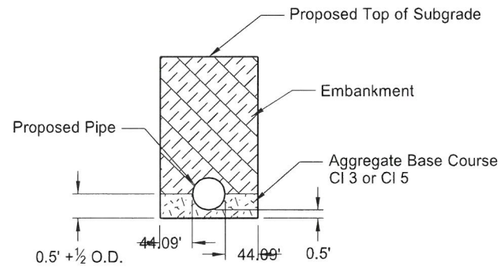
DETAILS RELEVENT TO STS 36" OR SMALLER



WATER MAIN INSULATION DETAIL



EXCAVATION DETAIL



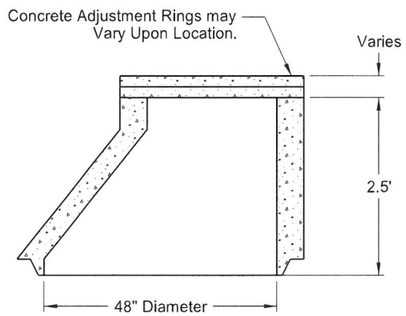
INSTALLATION DETAIL-CONCRETE PIPE

Pay Items
1) Pipe*

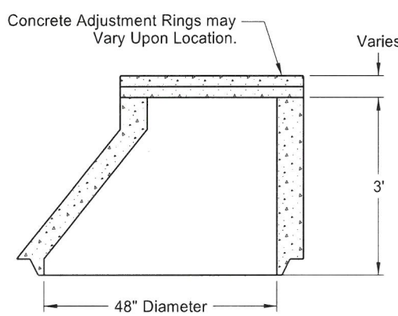
*Included in Pipe Pay Item
1) Pipe
2) Trench Excavation
3) Aggregate Base Course Cl 3 or Cl 5
4) Embankment
5) Removal of Pipe (if required)

NOTES:

1) Embankment is required to be Common Excavation - Type A. Common Excavation - Type A is required to be the material excavated during trench excavation (excluding any granular or bedding material that may be present around any existing pipe).

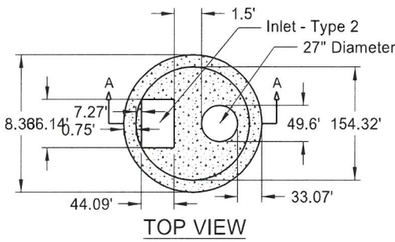


STA 35+81.43, 18.9' LT
*See Note 3

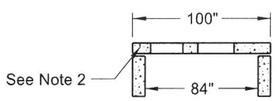


STA 35+78.19, 7.5' RT
*See Note 3

MANHOLE CONE ECCENTRIC RISERS

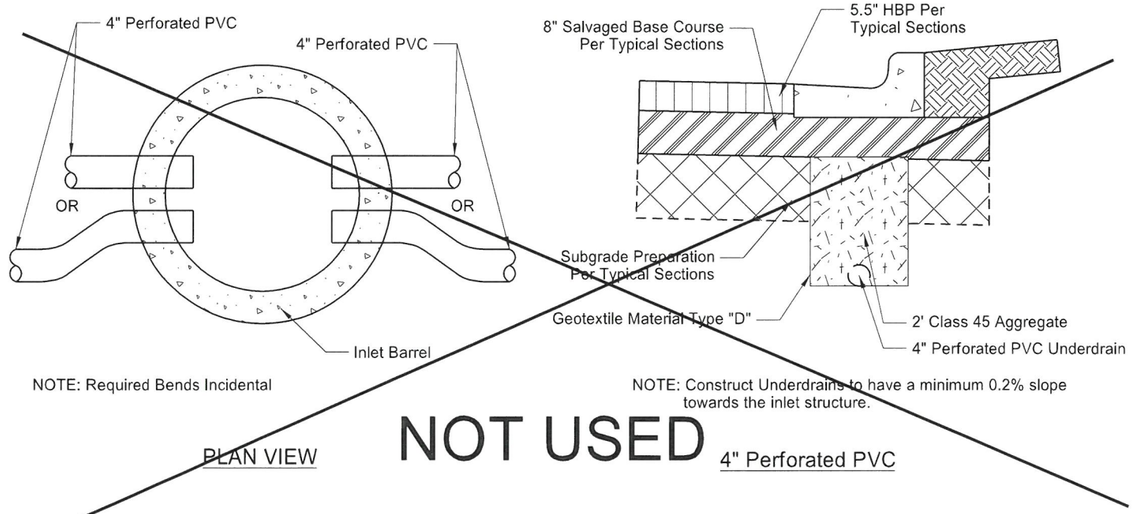


TOP VIEW



SECTION A - A

PRECAST COVER DETAIL
STA 35+60.30, 32.9' RT



NOTE: Required Bends Incidental

NOTE: Construct Underdrains to have a minimum 0.2% slope towards the inlet structure.

PLAN VIEW

NOT USED

4" Perforated PVC

PERFORATED PIPE - INLET CONNECTION DETAILS

NOTES:

2) See Standard Drawing D-722-5 for rebar layouts for the precast manhole cover. All costs for installing precast cover will be included in the Bid Item "Inlet Special - Type 2 84IN".

3) Construct Riser per Standard Drawing D-722-5
All costs for installing the new risers shall be included in the Bid Item "Manhole Cone".



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96" Storm Sewer Replacement Project Phase 2 Segment II
City of Jamestown
Jamestown, North Dakota

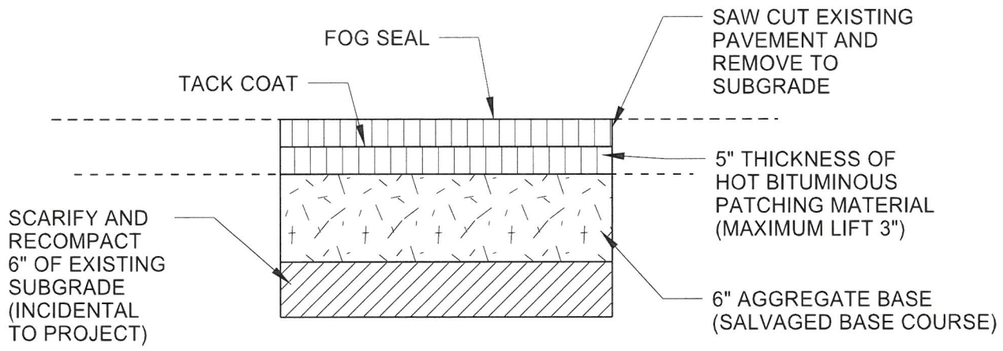
STS 36" and Smaller Details

Drawn By: ___ JDH | Surveyed By: ___ JDH | Project No: EC23-00-100.01
Checked By: ___ TLD | Designed By: ___ DRH | Date: ___ November 2025

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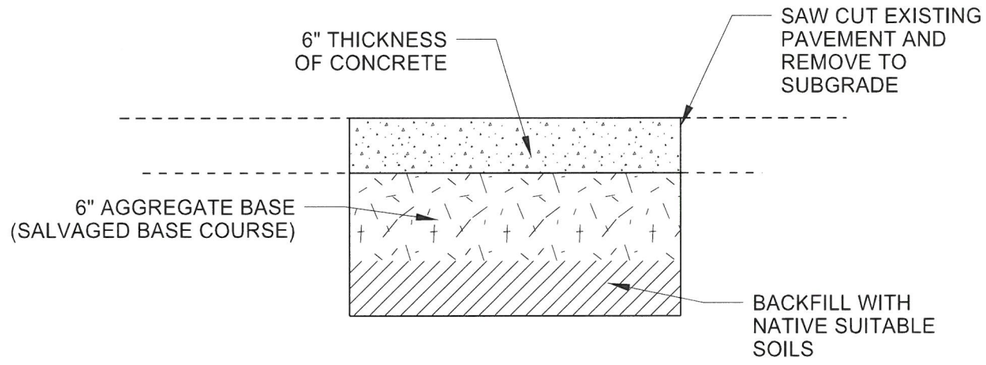
SECTION 20
SHEET 6



PAVEMENT REPLACEMENT ASPHALT - SECTION 1

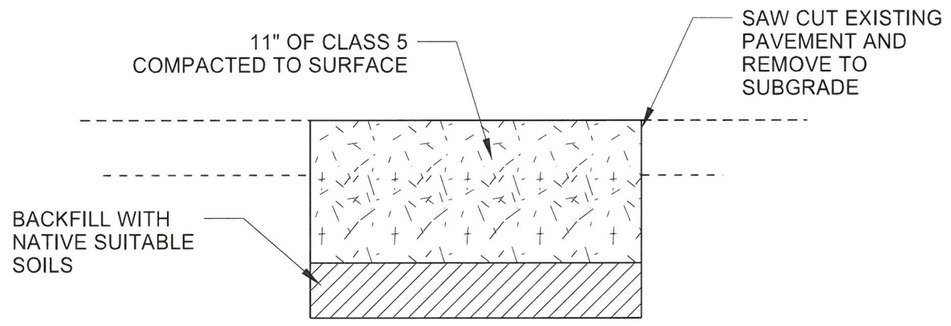
NOT TO SCALE

*ALL AREAS SHALL BE SECTION 1 UNLESS SHOWN ON PLANS.



PAVEMENT REPLACEMENT CONCRETE - SECTION 2

NOT TO SCALE



PARKING LOT PAVEMENT

NOT TO SCALE

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Rev No	Date	By	Description

96" Storm Sewer Replacement Project Phase 2 Segment II
City of Jamestown
Jamestown, North Dakota

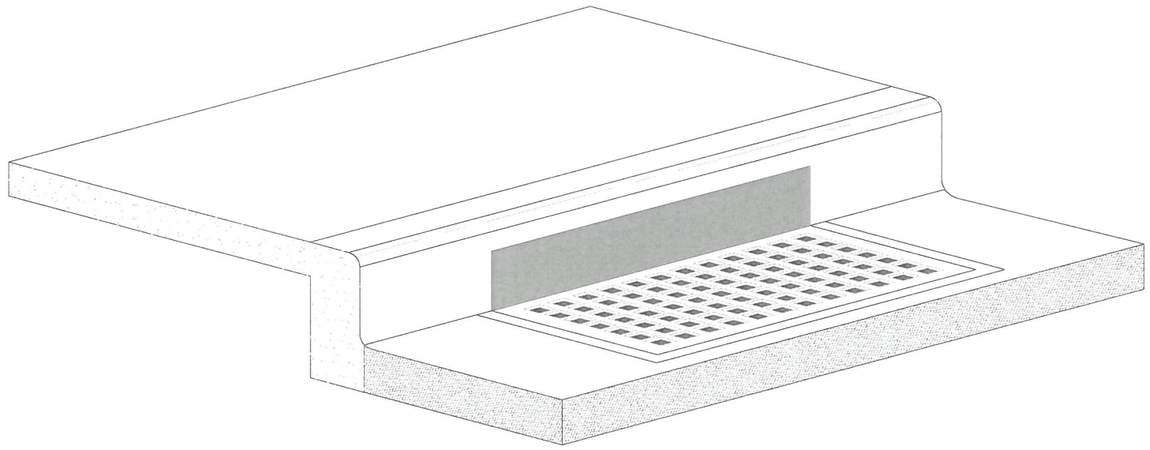
Subgrade Preparation

Project No: EC23-00-100.01
Surveyed By: JDH
Designed By: DRH
Date: November 2025
Drawn By: JDH
Checked By: TLD

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SECTION 20
SHEET 7



Inlet Protection Device

Installation Notes:

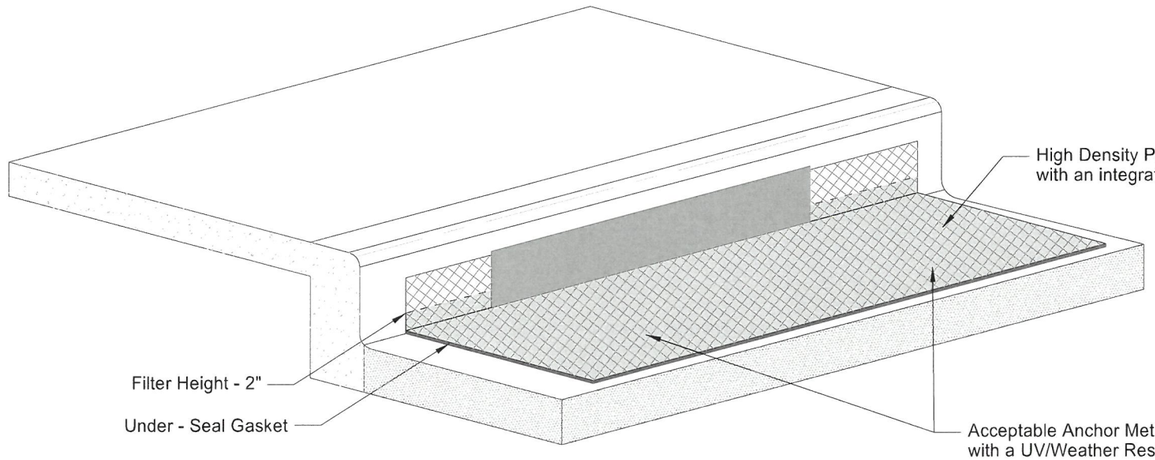
1. Place device tightly against drain opening and cover entire grate. Extend the device at least 2 inches past the grate toward the street.

2. Overlap the segments at longer openings.

3. Anchor the device so that water cannot flow behind it.

General Notes:

1. Remove material that falls into the inlet during maintenance or removal of the device.



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3/31/26

Rev No	Date	By	Description

96" Storm Sewer Replacement Project Phase 2 Segment II
City of Jamestown
Jamestown, North Dakota

Inlet Protection Detail

Drawn By: JLF
Checked By: DRH
Surveyed By: PJ
Designed By: JLF
Project No: EC23-00-100.01
Date: November 2025

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SECTION 20
SHEET 8



NOTES

1. Temporary access must be maintained throughout the project.
2. Lump sum payment to include the following estimated quantities:

   Removal and replacement of 2 decorative rocks (approximately 1 CY each)

   8 1/2' x 26' x 6" = +/- 4.1 CY of topsoil excavation

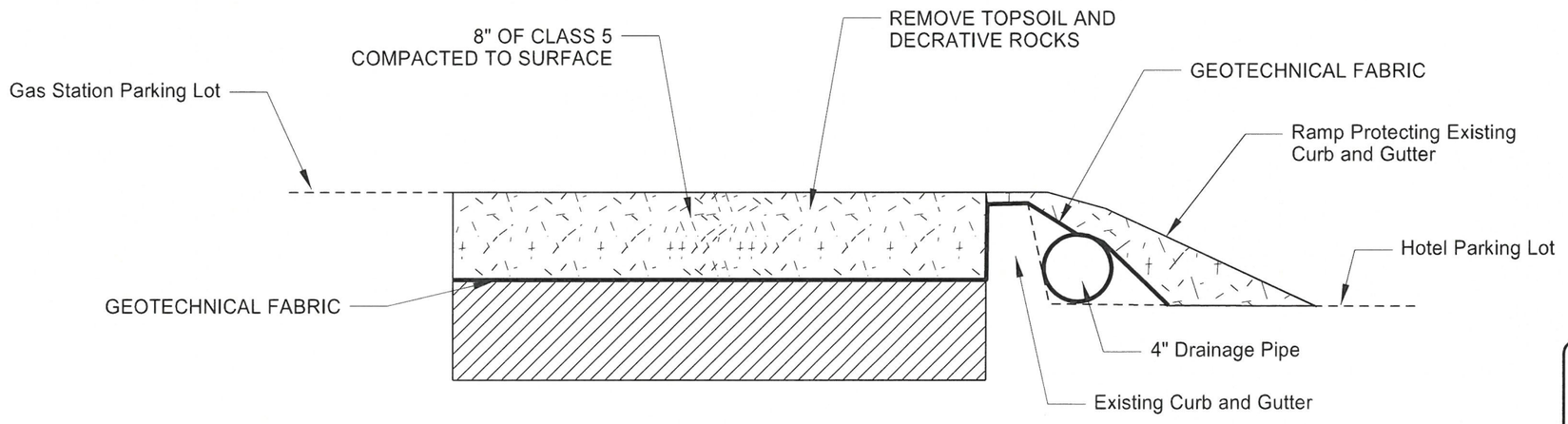
   +/- 28 LF of 4" PVC for drainage

   12' x 26' = +/- 312 SF of fabric - accounting for covering curb and gutter

   8 1/2' x 26' x 8" = +/- 6.6 CY of Class 5 - 5.5 CY and adding 20% for additional

   8 1/2' x 26' x 6" = +/- 4.1 CY of topsoil replacement

   8 1/2' x 26' = 221 SF of seeding
3. Once 24th St SW is fully reconstructed, the temporary access can be removed.



TEMPORARY ACCESS
NOT TO SCALE

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REGISTERED
PROFESSIONAL
PE 4432
ENGINEER
NORTH DAKOTA
3/6/26

Rev No.	Date	By	Description

96" Storm Sewer Replacement Project Phase 2 Segment II
City of Jamestown
Jamestown, North Dakota

Temporary Access Detail

Drawn By: JDH | Surveyed By: JDH | Project No: EC23-00-100.01
Checked By: TLD | Designed By: DRH | Date: November 2025

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SECTION 20
SHEET 9

DIVISION 01

STRUCTURAL STABILITY DURING CONSTRUCTION

- THE STRUCTURAL DRAWINGS ILLUSTRATE THE COMPLETED STRUCTURE WITH ALL ELEMENTS IN THEIR FINAL POSITIONS, PROPERLY SUPPORTED AND BRACED.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL CONSTRUCTION MEANS AND METHODS.
- THE CONTRACTOR, IN THE PROPER SEQUENCE, SHALL PROVIDE PROPER SHORING AND BRACING AS MAY BE REQUIRED DURING CONSTRUCTION TO ACHIEVE THE FINAL COMPLETED STRUCTURE.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL SITE SAFETY ISSUES AS MANDATED BY FEDERAL, STATE AND LOCAL LAWS AND REGULATIONS. THE CONTRACTOR SHALL EMPLOY A COMPETENT PERSON AS DEFINED IN OSHA REGULATIONS TO IDENTIFY SAFETY ISSUES. THE CONTRACTOR SHALL EMPLOY A QUALIFIED PERSON AS DEFINED IN OSHA REGULATIONS TO SPECIFY THE RESOLUTION OF SAFETY ISSUES.
- THE CONTRACTOR SHALL EMPLOY A QUALIFIED PROFESSIONAL SHORING SUBCONTRACTOR TO DESIGN AND SUPPLY SHORING SYSTEMS AS REQUIRED.
- THE STRUCTURAL STEEL FRAME IS NON-SELF-SUPPORTING PER AISC CODE OF STANDARD PRACTICE. TEMPORARY BRACING SHALL REMAIN IN PLACE UNTIL ALL FLOORS, WALLS, ROOF AND ANY OTHER SUPPORTING ELEMENTS ARE IN PLACE. THE STRUCTURAL DRAWINGS ILLUSTRATE THE COMPLETED STRUCTURE WITH ALL ELEMENTS IN THEIR FINAL POSITIONS, PROPERLY SUPPORTED AND BRACED.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR IDENTIFYING AND SPECIFYING ANY MODIFICATIONS TO THE STRUCTURE REQUIRED FOR COMPLIANCE WITH OSHA REGULATIONS AND GENERALLY ACCEPTED PRINCIPLES OF CONSTRUCTION. THE CONTRACTOR SHALL PROPOSE ALL SUCH MODIFICATIONS TO THE ENGINEER FOR REVIEW PRIOR TO CONSTRUCTION.
- THE CONTRACTOR SHALL PROVIDE ALL MEASURES NECESSARY TO PROTECT THE STRUCTURES DURING CONSTRUCTION. SUCH MEASURES SHALL INCLUDE, BUT ARE NOT LIMITED TO, BRACING AND SHORING FOR LOADS IMPOSED DURING CONSTRUCTION, ETC.
- THE COST OF ADDITIONAL DESIGN OR REVIEW WORK BY THE ENGINEER DUE TO SELECTION OF AN OPTION BY THE CONTRACTOR, OR DUE TO ERRORS OR OMISSIONS IN CONSTRUCTION BY THE CONTRACTOR, SHALL BE BORNE BY THE CONTRACTOR.
- ANY ENGINEERING DESIGN PROVIDED BY OTHERS AND SUBMITTED FOR REVIEW SHALL BEAR THE SEAL AND SIGNATURE OF THE ENGINEER OF RECORD FOR THE DESIGN.

STRUCTURAL CONSTRUCTION OBSERVATION:

IT IS THE CONTRACTOR'S RESPONSIBILITY TO INSPECT ALL STRUCTURAL WORK FOR CONFORMANCE WITH THE CONTRACT DOCUMENTS. THE CONTRACTOR IS RESPONSIBLE FOR PROVIDING ADEQUATE FACILITIES FOR THE STRUCTURAL CONSTRUCTION OBSERVED, TO ALLOW HIM TO PERFORM HIS WORK SAFELY AND EFFICIENTLY.

SPECIAL INSPECTIONS:

SPECIAL INSPECTIONS IN ACCORDANCE WITH CHAPTER 17 OF THE 2021 IBC IS REQUIRED FOR THE FOLLOWING:

1. REQUIRED SPECIAL INSPECTIONS AND TESTS OF SOILS - TABLE 1705.6
2. REQUIRED SPECIAL INSPECTIONS AND TESTS OF CONCRETE CONSTRUCTION - TABLE 1705.3
3. SPECIAL INSPECTION OF FABRICATED ITEMS: WHERE FABRICATION OF STRUCTURAL, LOAD-BEARING OR LATERAL LOAD-RESISTING MEMBERS OR ASSEMBLIES IS BEING CONDUCTED ON THE PREMISES OF A FABRICATOR'S SHOP, SPECIAL INSPECTIONS OF THE FABRICATED ITEMS SHALL BE PERFORMED DURING FABRICATION, EXCEPT WHERE THE FABRICATOR HAS BEEN APPROVED TO PERFORM WORK WITHOUT SPECIAL INSPECTIONS IN ACCORDANCE WITH SECTION 1704.2.5.1.

KEY OSHA REQUIREMENTS (OTHER PROVISION MAY APPLY):

- OSHA 29 CRF 1926 SUBPART L, SCAFFOLDS FOR REQUIREMENTS
- OSHA 1910.29 - FALL PROTECTION SYSTEMS AND FALLING OBJECT PROTECTION - CRITERIA AND PRACTICES

DESIGN CRITERIA

LIVE LOADS

ROOF LOAD	HL-93

SNOW LOADS

GROUND SNOW LOAD, PG	40 PSF
SNOW EXPOSURE FACTOR, CE	1.0
SNOW LOAD IMPORTANCE FACTOR, I	1.0

SEISMIC LOADS

SEISMIC IMPORTANCE FACTOR, I	1.0
RISK CATEGORY	II
MAPPED SPECTRAL RESPONSE ACCELERATIONS	
S/S	0.052g
S/1	0.020g
SITE CLASS	D
SPECTRAL RESPONSE COEFFICIENTS	
S/DS	0.056g
S/D1	0.032g
SEISMIC DESIGN CATEGORY	A

GEOTECHNICAL INFORMATION

ALLOWABLE SOIL BEARING	1500 PSF
FROST DEPTH	60 INCHES

ADDITIONAL LOAD CRITERIA SHALL BE IN ACCORDANCE WITH ASCE 7-16 MINIMUM DESIGN LOADS FOR BUILDING AND OTHER STRUCTURES.

CODE USED:

2021 INTERNATIONAL BUILDING CODE WITH LOCAL AMENDMENTS
BUILDING CODE REQUIREMENTS FOR STRUCTURAL CONCRETE (ACI 318)
MINIMUM DESIGN LOADS FOR BUILDINGS AND OTHER STRUCTURES (ASCE 7)
MANUAL OF STEEL CONSTRUCTION (AISC)
CODE OF STANDARD PRACTICE (AISC)

DIVISION 03 – CONCRETE

A. STRUCTURAL STABILITY DURING CONSTRUCTION
   1. REFERENCES
      A. ACI 301 "SPECIFICATIONS FOR STRUCTURAL CONCRETE"
      B. ACI 347 "GUIDE TO FORMWORK FOR CONCRETE"
   2. THE CONTRACTOR SHALL BE RESPONSIBLE FOR DESIGN, CONSTRUCTION AND BRACING OF ALL FORMWORK AND SHORING.
   3. PROVIDE 3/4" X 3/4" CHAMFER ON ALL EXPOSED EXTERIOR CORNERS, UNLESS OTHERWISE SPECIFIED.

B. REINFORCING STEEL
   1. REFERENCES
      A. ACI 301 "SPECIFICATIONS FOR STRUCTURAL CONCRETE"
      B. B. ACI "DETAILING MANUAL"
      C. CRSI MSP-1 "MANUAL OF STANDARD PRACTICE"
   2. REINFORCING STEEL: ASTM A615 GRADE 60 DEFORMED BARS UNLESS OTHERWISE SPECIFIED. ASTM A706 DEFORMED BARS WHERE SPECIFIED ONLY.
   3. PROVIDE MINIMUM CONCRETE COVER OVER REINFORCING STEEL AS FOLLOWS UNLESS OTHERWISE SPECIFIED.
      3 INCHES FOR CONCRETE CAST AGAINST EARTH
      2 INCHES OTHERWISE, EXCEPT 1-1/2 INCHES TO TOP OF SLAB
   4. ADD #5X 5'-0" DIAGONAL EACH FACE AT ALL RE-ENTRANT CORNERS U0S.
   5. SECURE ALL REINFORCING, INCLUDING DOWELS, IN POSITION WITH BAR SUPPORTS PER CRSI BEFORE CONCRETE PLACEMENT.
   6. ALL REINFORCING STEEL SHALL BE BENT COLD. FIELD BENDING SHALL NOT BE PERFORMED UNLESS SHOWN ON THE DRAWINGS OR PERMITTED BY THE ENGINEER.
   7. REINFORCING STEEL WHICH IS PLACED ADJACENT TO A CONCRETE SURFACE WHICH SHALL BE CAST AGAINST EARTH SHALL BE SUPPORTED AWAY FROM THE EARTH SURFACE WITH CMU BLOCKS OF APPROPRIATE THICKNESS. THE CMU BLOCKS SHALL BE WIRED TO THE REINFORCING BARS THEY SUPPORT.
   8. REINFORCING STEEL WHICH IS PLACED ADJACENT TO A CONCRETE SURFACE WHICH SHALL BE CAST AGAINST WOOD, METAL, OR OTHER REMOVEABLE FORM WORK SHALL BE SUPPORTED AWAY FROM THE FORM WORK WITH CHAIRS OR BOLTERS. ALL COMPONENTS OF THE CHAIRS OR BOLSTERS WHICH ARE IN CONTACT WITH THE FORM SHALL BE NONCORRODING. COMPONENTS OF THE CHAIRS OR BOLSTERS WHICH ARE SUBJECT TO CORROSION SHALL NOT BE PLACED WITHIN ONE INCH OF THE FORMED SURFACE.
   9. BOLSTERS SHALL BE PROVIDED BETWEEN THE LAYERS OF REINFORCING STEEL WITHIN WALLS AND SLABS.
   10. THE SPACING OF BOLSTERS, CHAIRS, AND OTHER REINFORCING STEEL SUPPORTS SHALL BE LIMITED SO AS TO PREVENT DISPLACEMENT OF THE REINFORCING DUE TO PLACEMENT OF THE CONCRETE. IN THE CASE OF SLABS, ALL LAYERS OF REINFORCING STEEL SHALL BE SUPPORTED SO AS TO BE CAPABLE OF CARRYING THE LOADS OF THE WORKERS PLACING THE STEEL AND CONCRETE.
   11. LAP REINFORCING STEEL PER THE SCHEDULE BELOW UNLESS OTHERWISE SPECIFIED (UOS) ON THE DRAWINGS.

REINFORCING BAR LAP SCHEDULE		
REBAR SIZE	DEVELOPMENT LENGTH	
	OTHER BAR	TOP BAR
#4	19"	25"
#5	24"	32"
#6	29"	38"
#8	48"	63"

REF: ACI 25.4

BAR LAP SCHEDULE NOTES:
A. REBAR LAP LENGTHS ARE FOR fc=4,000 PSI CONCRETE AND GRADE 60 BARS WITH AT LEAST 2 INCH COVER AND BAR SPACING AT LEAST FOUR BAR DIAMETERS, OR 5 INCHES MINIMUM FOR #9 THRU #11.
B. TOP BAR LAPS ARE HORIZONTAL LAPS WHERE MORE THAN 12 INCHES OF FRESH CONCRETE IS PLACED BELOW THE BARS. TOP BAR LAP LENGTHS MAY BE USED THROUGHOUT AT THE CONTRACTORS DISCRETION.
C. GRADE BEAM LAP LOCATIONS:
   i. LAP TOP BARS NEAR MID-SPAN, WITHIN MIDDLE THIRD OF SPAN.
   ii. LAP BOTTOM BARS NEAR SUPPORT, WITHIN ONE LAP LENGTH OF FOOTING/PILECAP.

C. CONCRETE BONDING AGENT
   1. STRUCTURAL BONDING AGENT FOR CONCRETE:
      A. THREE-COMPONENT WATER BASED EPOXY RESIN/PORTLAND CEMENT TYPE "ARMATEC 110 EPOCHEM" BY SIKA CORP OR "DURALPREP A.C." AS MANUFACTURED BY EUCLID CHEMICAL CO.

D. CONCRETE MATERIALS
   1. PORTLAND CEMENT:
      A. ASTM C150 TYPE V
   2. FLY ASH:

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Rev No	Date	By	Description

96" Storm Sewer Replacement Project Phase 2 Segment II
City of Jamestown
Jamestown, ND

Structural Notes

Project No: EC23-00-100.01
Surveyed By: ____ Date: May 2025
Designed By: MM
Drawn By: MM
Checked By: AS

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SECTION 21
SHEET 1

A. ASTM 618 CLASS C OR F INCLUDING TABLE 3 SPECIFICATIONS

3. CONTENT BY WEIGHT:
   A. 15% MINIMUM EXCEPT SLABS - 25% MAXIMUM
4. NORMAL WEIGHT AGGREGATES:
   A. ASTM C33, CLASS 3S OR GREATER
5. WATER:
   A. POTABLE, IN CONFORMANCE WITH ASTM C94
6. WATER-REDUCING ADMIXTURE:
   A. ASTM C494
7. AIR-ENTRAINING ADMIXTURE:
   A. ASTM C260
8. STRUCTURAL CONCRETE:
   A. SEE MIXES BELOW

STRUCTURAL CONCRETE MIXES					
CLASS/USE	f'c 28 DAY COMPRESSIVE STRENGTH	MAXIMUM W/ (C+P) RATIO	MAXIMUM AGGREGATE SIZE	TOTAL AIR CONTENT	SLUMP RANGE
FOUNDATIONS	4,000 PSI	0.45	1"	5% - 7%	3" – 5"
INTERIOR FLATWORK	3,500 PSI	0.45	3/4"	<3.0%	3" – 5"
EXTERIOR FLATWORK	4,000 PSI	0.45	3/4"	5% - 7%	3" – 5"

E. CAST-IN-PLACE CONCRETE

1. COORDINATE WITH OTHER TRADES TO ENSURE ALL GROUNDING, SLEEVES, EMBEDMENTS AND OTHER ITEMS ARE INSTALLED BEFORE CONCRETE PLACEMENT. IF CUTTING REINFORCEMENT APPEARS NECESSARY TO INSTALL SUCH ITEMS, CONTACT THE ENGINEER.
2. PLACE CONCRETE AT A UNIFORM RATE AS CLOSE AS POSSIBLE TO FINAL POSITION TO PREVENT MIX SEGREGATION.
3. CONSIDER CONCRETE SHRINKAGE IN PLACEMENT SEQUENCE. IF NOT SPECIFICALLY DETAILED, CONSTRUCTION JOINTS MUST BE APPROVED BY THE ENGINEER - BOTH TYPE AND LOCATION.
4. CONSOLIDATE ALL CONCRETE PLACEMENTS WITH THE AID OF MECHANICAL VIBRATION.
5. PLACE CONCRETE IN A CONTINUOUS OPERATION WITHOUT INTERRUPTIONS. THE LAYER METHOD MAY BE USED PROVIDED LAYER/LIFT THICKNESS RANGE IS 12 TO 30 INCHES WITH NO MORE THAN 30 MINUTES ELAPSING BETWEEN PLACING OF ADJACENT LAYERS - VIBRATE TO MELD LAYERS TOGETHER TO AVOID A HORIZONTAL PLANE OF WEAKNESS.
6. LAYER/LIFT THICKNESS IN WALLS SHOULD NOT BE GREATER THAN 36 INCHES.
7. FLOAT AND BROOM FINISH EXTERIOR CONCRETE SURFACES. THE ADDITION OF FREE WATER AS A FINISHING AID IS PROHIBITED.
8. WHEN SLAB CONTRACTION JOINTS ARE ACCOMPLISHED BY SAW CUTTING, 'SOFT-CUT' JOINTS AS SOON AS PRACTICAL - USE OF TEST CUTS ARE RECOMMENDED.
9. PROTECT AND CURE ALL CONCRETE BEGINNING IMMEDIATELY AFTER FINISHING OR STRIPPING FORMS. THIS INCLUDES FORMED SURFACES IF FORMS ARE STRIPPED WITHIN 72 HOURS OF CONCRETE PLACEMENT.
10. FORM RELEASE AGENTS WHICH MAY REMAIN ON THE SURFACE OF CONCRETE WITHIN WATER CONTAINMENT STRUCTURSE SHALL BE NONTOXIC AND SHALL BE ODORLESS AND COLORLESS AND SHALL BE APROVED FOR USE IN POTABLE WATER CONTAIMENTS BY THE NATIONAL SANITATION FOUNDATION.
11. A MINIMUM OF 2 INCHES OF CLEAR COVER SHALL BE PROIVDED BETWEEN ALL EMBEDMENTS AND REINFORCING STEEL AND WATER STOPS UNLESS NOTED OTHERWISE.
12. ALL ALUMINIMUM SURFACES TO BE PLACED IN CONTACT WITH CONCRETE SHALL BE COATED WITH BITUMASTIC PAINT.
13. CONCRETE CONTRACTOR SHALL PROVIDE WRITTEN NOTIFICATION TO THE STEEL ERECTOR INDICATING THE DATE WHEN CONCRETE SUPPORTING BUILDING COLUMNS HAS ATTAINED AT LEAST 75 PERCENT OF THE SPECIFIED COMPRESSIVE STRENGTH.
14. FIELD REPAIR OR MODIFICATION OF ANCHOR RODS MUST BE APPROVED BY THE ENGINEER.
15. INSPECTION AND TESTING PER DIVISION-01.

F. WATERSTOPS

1. PVC WATER STOPS SHALL BE FURNISHED FOR ALL JOINTS WHERE A WATER STOP IS CALLED FOR UNLESS NOTED OTHERWISE.
2. WATER STOPS SHALL BE PLACED IN ALL CONSTRUCTION JOINTS IN SUMPS, PITS, OR TANKS AND AS SHOWN ON THE DRAWINGS.
3. IN JOINTS CONSTRUCTED WHERE A WATER STOP IS CALLED FOR, PVC WATER STOPS MAY BE SUSBTITUTED FOR BENTONITE ROPE WATER STOPS.
4. BENTONITE ROPE WATER STOPS SHALL NOT BE SUSTITUTED FOR PVC WATER STOPS UNLESS APPROVED BY THE ENGINEER.
5. CONSOLIDATE ALL CONCRETE PLACEMENTS WITH THE AID OF MECHANICAL VIBRATION.
6. BENTONITE ROPE WATER STOPS SHALL BE PLACED WITHIN JOINTS SO AS TO PROIVDE NO LESS THAN 2 INCHES OF COVER OVER THE WATER STOP IN THE COMPLETED JOINT.
7. SURFACES TO WHICH WATER STOPS ARE TO BE APPLIED SHALL BE PRIMED WITH A BUTYL PRIMER IN ACCORDANCE WITH MANUFACTURERS RECOMMENDATIONS.
8. BENTONITE WATER STOPS SHALL BE SECURED IN PLACE WITH CUT NAILS DRIVEN THROUGH THE MATERIAL AT INTERVALS NOT TO EXCEED 12 INCHES.
9. JOINTS IN BENTONITE WATER STOPS SHALL BE KNEADED TOGETHER TO FORM A CONTINIOUS ROPE.
10. PVC WATER STOPS SHALL BE SECURED IN PLACE WITH TIE WIRES OR OTHER MEANS. NO WIRES OR NAILS SHALL PENETRATE THE WATER STOP BETWEEN THE SECOND SERRATION FROM EITHER EDGE AND THE MIDDLE OF THE WATER STOP. THE TIES TO SECURE THE WATER STOP SHALL BE SPACED GREATER THAN 12 INCHES.
11. JOINTS BETWEEN PVC WATER STOPS SHALL BE MADE BY MEANS OF THERMAL WELDING. ALL PVC WATER STOPS WHICH ARE OVERHEATED AS INDICATED BY DISCOLORATION OF THE MATERIAL SHALL BE DISCARDED. PVC WATER STOPS SHALL NOT BE STRESS UNTIL THEY HAVE THOROUGHLY COOLED. ALL WELDS IN PVC WATER STOPS SHALL BE CONTINUOUS THROUGHOUT THE WIDTH AND THICKNESS OF THE WATER STOP.
12. THE COST OF FURNISHING AND INSTALLING WATERSTOPS AND ALL APPURTENANCES THERETO SHALL BE INCLUDED IN PRICE BID FOR THE CONCRETE WORK IN WHICH THE WATERSTOP IS INSTALLED.

G. TESTS AND INSPECTIONS

1. A QUALIFIED INDEPENDENT INSPECTOR MUST PERFORM THESE INSPECTIONS AND VERIFICATIONS. "QUALIFIED" MEANS: ICC STRUCTURAL STEEL AND WELDING SPECIAL INSPECTOR - PER ENGINEER OF RECORD FOR METAL BUILDING EXCEPTION: A FABRICATOR MAY PERFORM ITS OWN INSPECTION IF IT IS REGISTERED AND APPROVED TO DO SO.

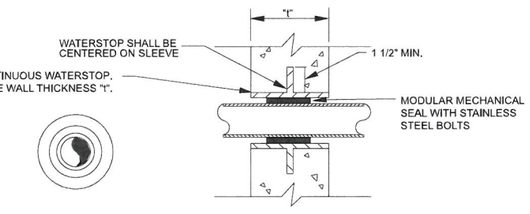
CONCRETE	CONT.	PERIODIC
INSPECT REINFORCING STEEL AND PLACEMENT		X
INSPECT ALL PRE-INSTALLED ANCHOR RODS		X
INSPECT ALL POST-INSTALLED ANCHOR RODS	X	
VERIFY USE OF APPROVED DESIGN MIX		X
INSPECT FORMWORK		X
PERFORM SLUMP, AIR, AND TEMP. TESTS	X	
FABRICATE STRENGTH TEST SPECIMENS	X	
TEST CYLINDERS		X
INSPECT CONCRETE PLACEMENT TECHNIQUES	X	
INSPECT CURING TECHNIQUES		X

USE 6" DIA x 12" CYLINDERS UNLESS NOTED OTHERWISE
TEST 3 CYLINDERS PER 50 CU. YDS. MINIMUM 5 CYLINDERS UNLESS NOTED OTHERWISE

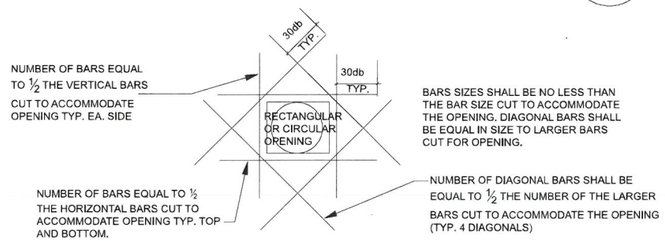
SOILS	CONT.	PERIODIC
VERIFY MATERIAL BELOW FOOTINGS		X
PRIOR TO PLACEMENT OF COMPACTED FILL, VERIFY EXCAVATION DEPTH, SUBGRADE MATERIAL AND PROPER SITE PREPARATION		X
CLASSIFY AND TEST COMPACTED FILL		X
VERIFY MATERIALS, DENSITIES AND LIFT THICKNESS DURING PLACEMENT AND COMPACTION OF COMPACTED FILL		X

2. THE INSPECTOR MUST (A) RECORD INSPECTIONS AND FURNISH REPORTS TO THE ENGINEER AND TO THE BUILDING OFFICIAL; AND (B) FURNISH A FINAL REPORT TO THE BUILDING OFFICIAL OF INSPECTIONS AND CORRECTIONS.
3. THE INSPECTOR MUST IMMEDIATELY NOTIFY THE CONTRACTOR/FABRICATOR OF ANY DISCREPANCIES. IF DISCREPANCIES ARE NOT CORRECTED, NOTIFY THE ENGINEER.

All pipes, vents and conduits through floors, walls or roof slabs of water or wastewater treatment, storage or handling structures shall be sealed with a modular mechanical seal and sleeve as shown below.



PIPE PENETRATION SEAL DETAILS



NOTES:
1. This detail shall apply to all openings which, due to their size, result in the interruption of reinforcing steel or have a diameter or, in the case of rectangular openings, a dimension greater than 6 inches.
2. The detail shown applies to all layers of reinforcing steel in the structural element through which the opening passes.
3. A minimum of 2" clear shall be maintained between the reinforcing steel and the edge of the opening or sleeve.
4. db = bar diameter.
5. The annulus of penetrations which do not require modular mechanical seals shall be roped and caulked.

TYPICAL DETAIL FOR REINFORCING STEEL AROUND OPENINGS



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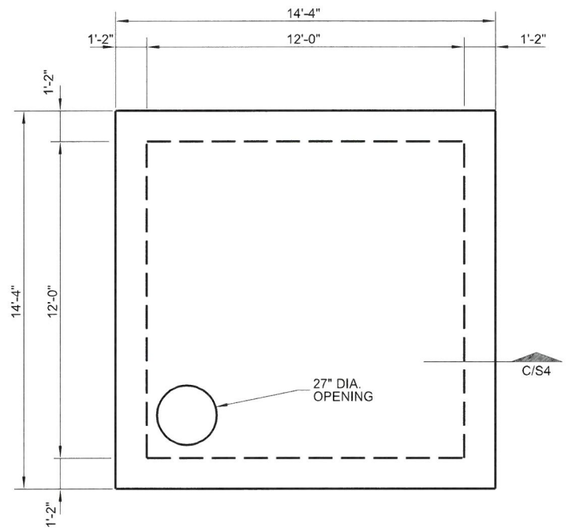
Structural Notes

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Designed By: MM
Drawn By: MM
Checked By: AS

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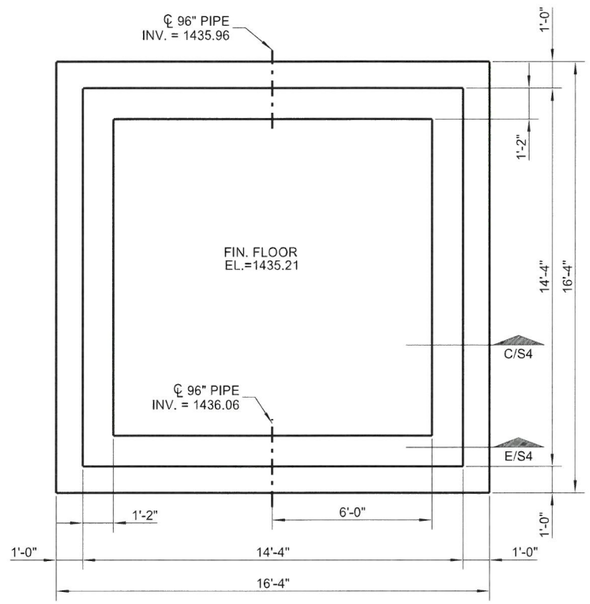
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SECTION 21 SHEET 2



A ROOF PLAN

0 3'



B FLOOR PLAN

0 3'

NOTES:

1. LOCATION OF PIPE PENETRATION TO BE VERIFIED IN THE FIELD.
2. TOPPING SLAB TO SHAPE INVERTS IS TO BE PLACED AFTER INSTALLATION OF PIPES.

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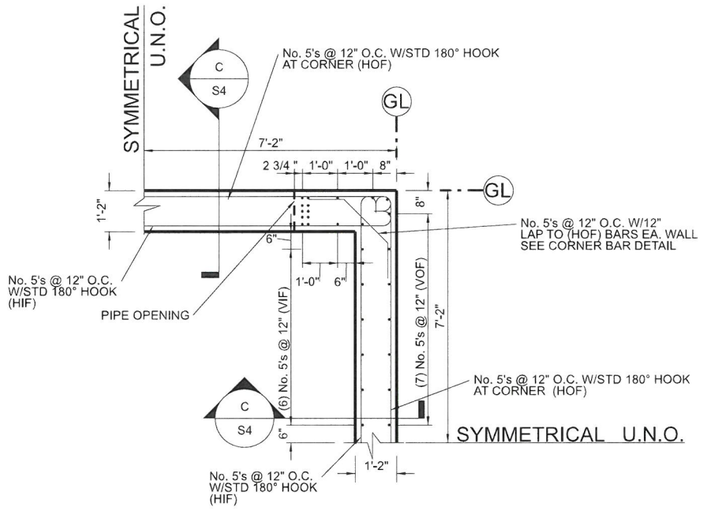
MANHOLE STRUCTURE

Drawn By: MM | Surveyed By: | Project No: EC23-00-100.01
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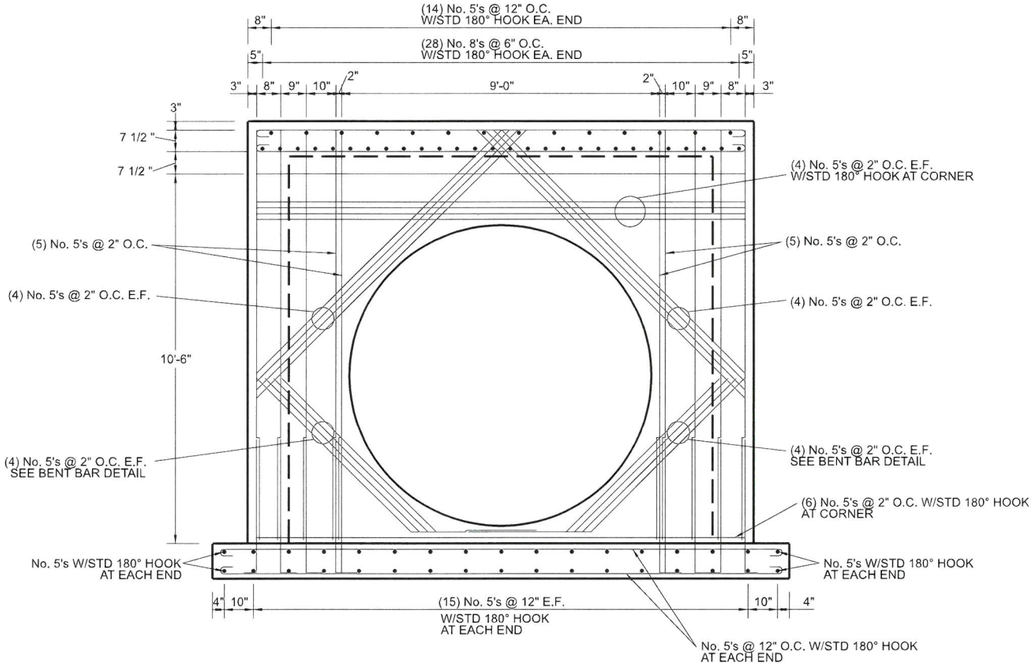
SECTION 21
SHEET 3



D QUARTER PLAN - WALL REINFORCING

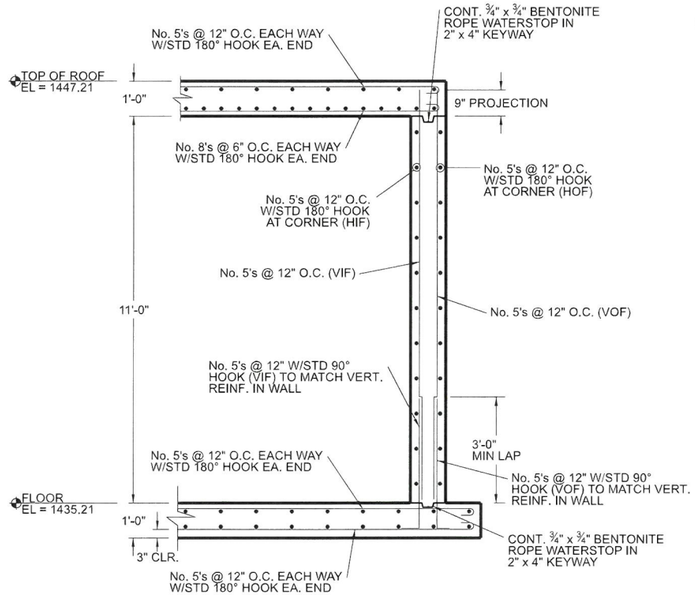
0 2'

HEF = HORIZ EACH FACE
HIF = HORIZ INSIDE FACE
HOF = HORIZ OUTSIDE FACE
VEF = VERTICAL EACH FACE
VIF = VERTICAL INSIDE FACE
VOF = VERTICAL OUTSIDE FACE



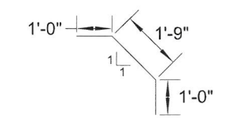
E SECTION - REINFORCING

0 2'

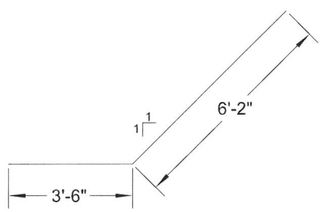


C SECTION - REINFORCING

0 2'



CORNER BAR DETAIL



BENT BAR DETAIL

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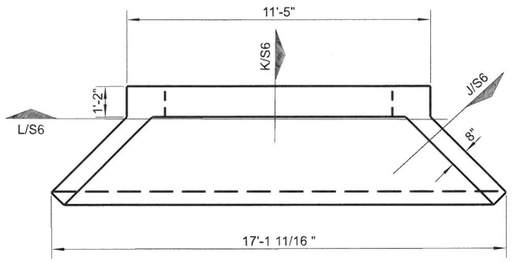
MANHOLE STRUCTURE REINFORCING

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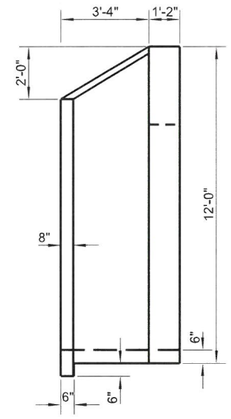
SECTION 21 SHEET 4



NORTH

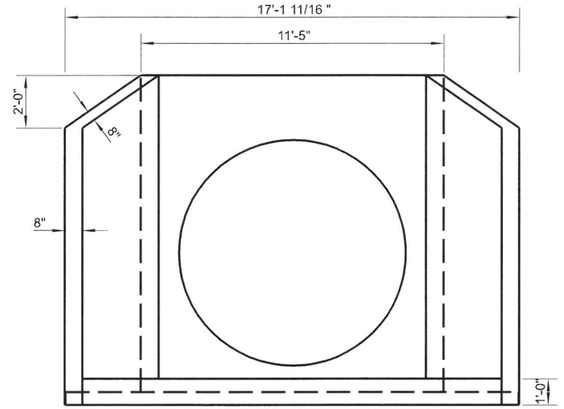
F ENDWALL PLAN VIEW

0 3'



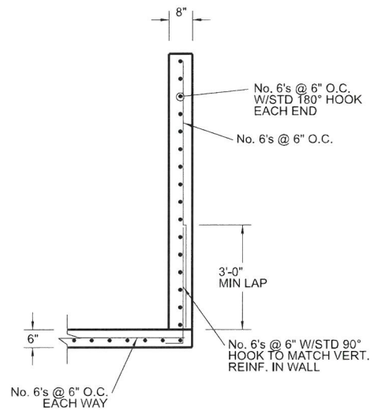
G ENDWALL SIDE VIEW

0 3'



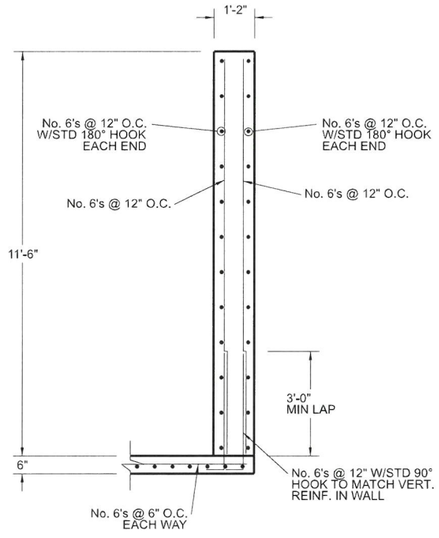
H ENDWALL FRONT VIEW

0 3'



J SECTION - REINFORCING

0 2'



K SECTION - REINFORCING

0 2'

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Jamestown, ND

ENDWALL STRUCTURE

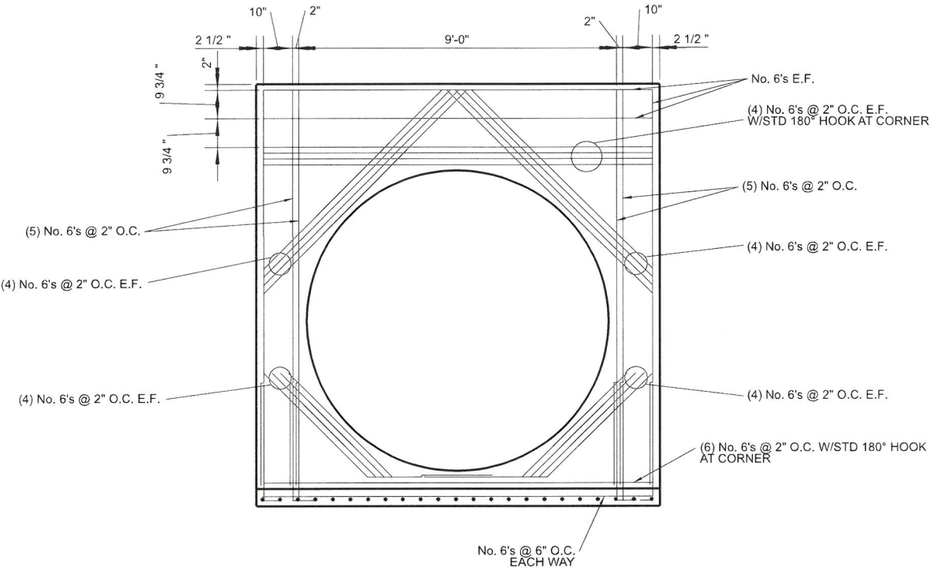
Drawn By: MM | Surveyed By: | Project No: EC23-00-100.01
Checked By: AS | Designed By: MM | Date: May 2025

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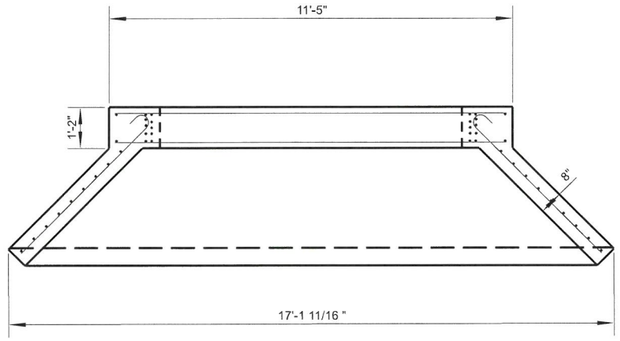
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SECTION 21
SHEET 5



L SECTION - REINFORCING

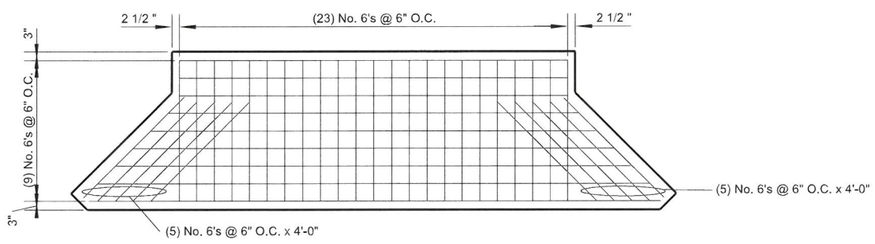
0 2'



M ENDWALL PLAN - WALL REINFORCING

0 2'

BENT BAR DETAIL



N ENDWALL PLAN - FLOOR REINFORCING

0 2'

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3/11/26

Rev No	Date	By	Description

96" Storm Sewer Replacement Project Phase II Segment II
City of Jamestown
Jamestown, ND

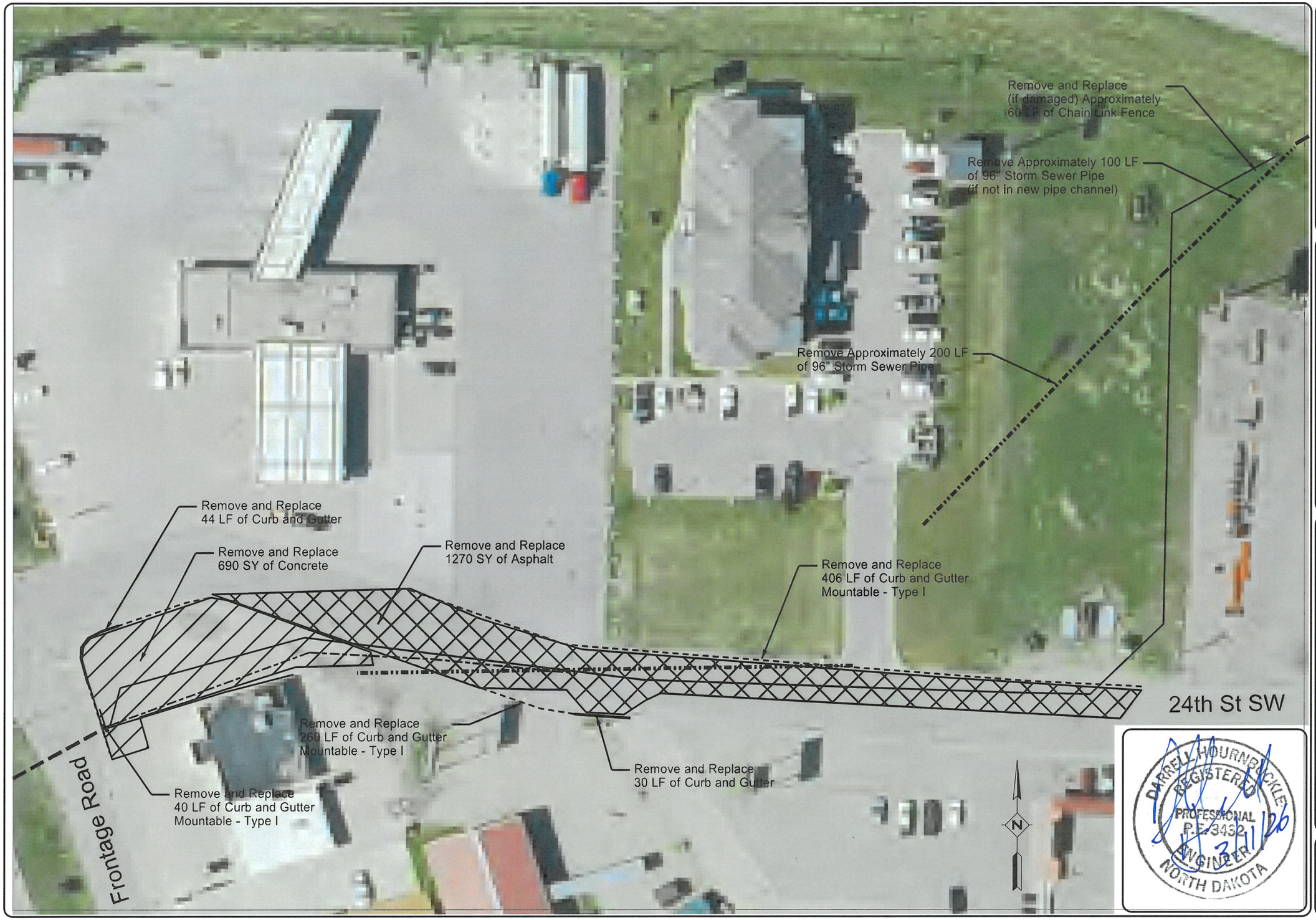
ENDWALL STRUCTURE REINFORCING

Drawn By: MM | Surveyed By: | Project No: EC23-00-100.01
Checked By: AS | Designed By: MM | Date: May 2025

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SECTION 21
SHEET 6



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96" Storm Sewer Replacement Project Phase 2 Segment II
City of Jamestown
Jamestown, North Dakota

Removals - Phase II Segment II

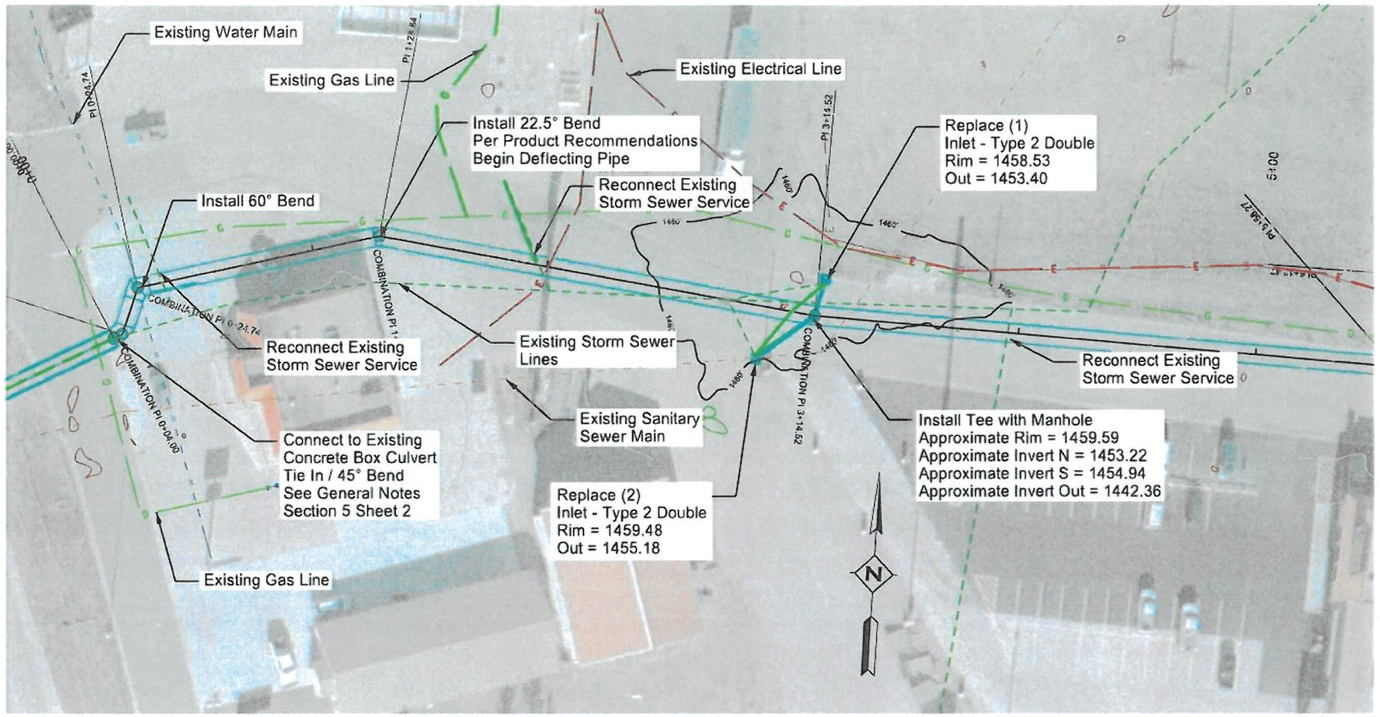
Drawn By: JDH | Surveyed By: PJ | Project No: EC23-00-100.01
Checked By: JWS | Designed By: DRH | Date: November 2025

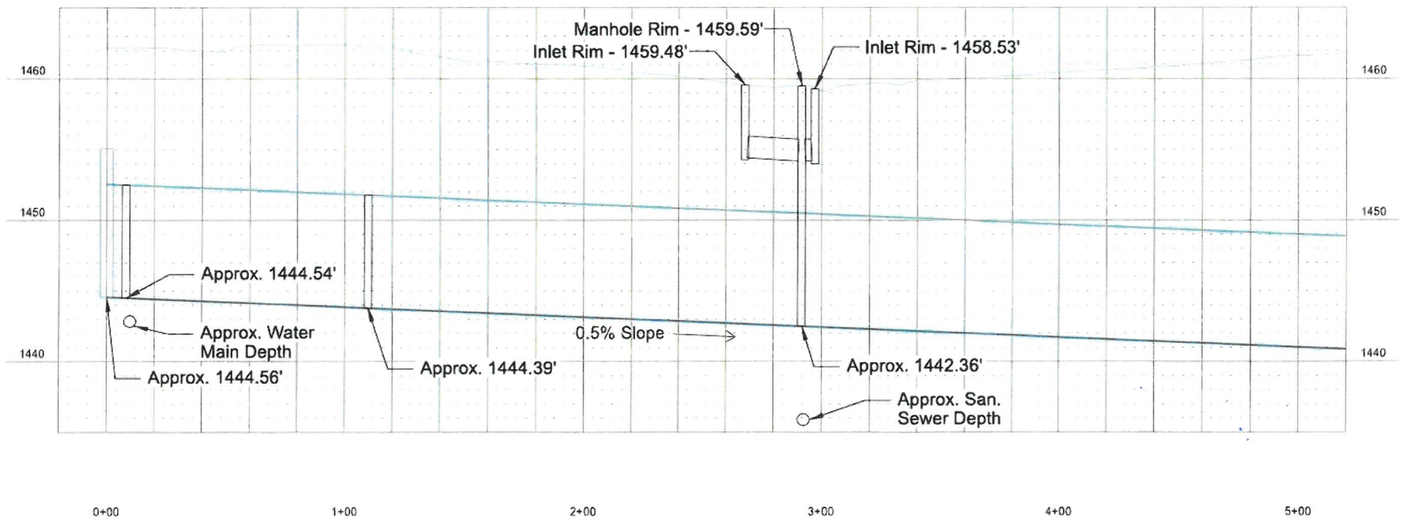
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Rev No	Date	By	Description

96" Storm Sewer Replacement Project Phase 2 Segment II
Jamestown Reservoir Flood Improvement
Jamestown, North Dakota

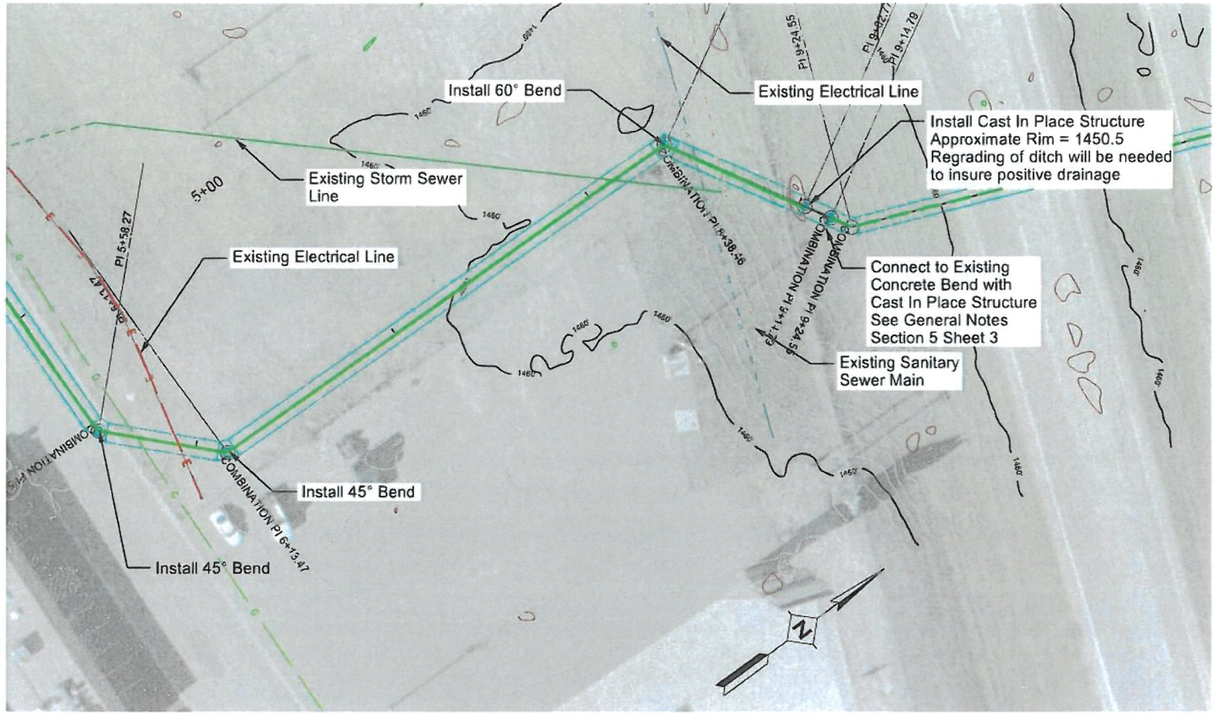
Plan and Profile

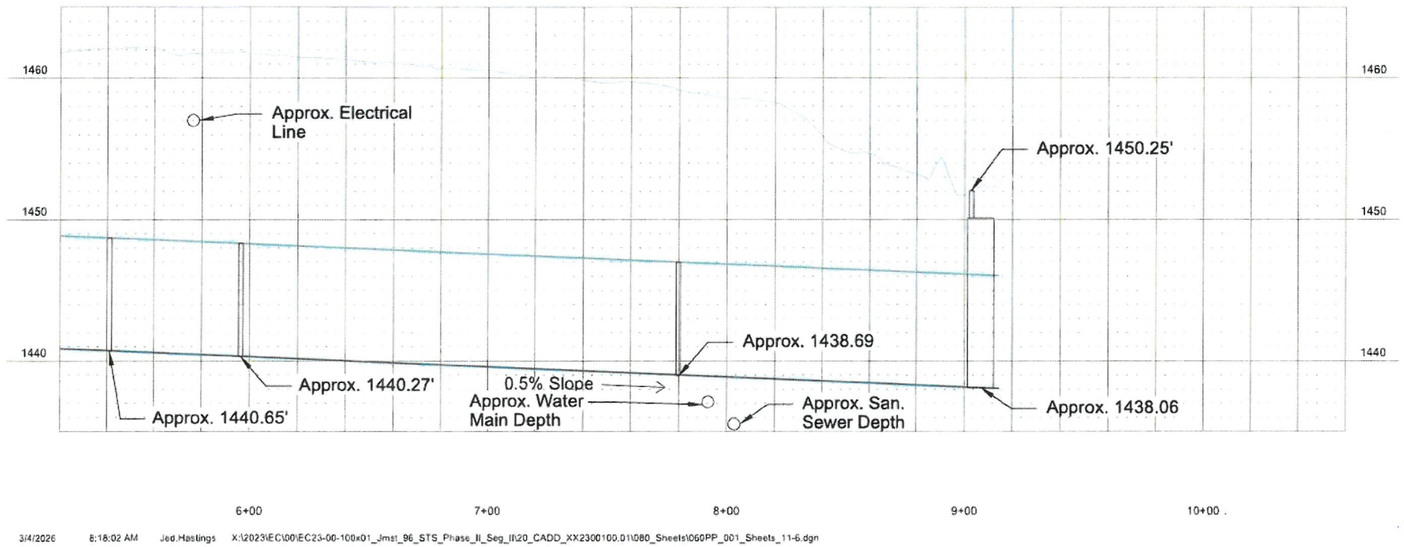
Surveyed By: ____ PJ ____ Project No: EC23-00-100.01
Designed By: ____ DRL ____ Date: November 2025
Drawn By: ____ JDH ____
Checked By: ____ DRL ____

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60
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Rev No.	Date	By	Description

96" Storm Sewer Replacement Project Phase 2 Segment II
City of Jamestown
Jamestown, North Dakota

Plan and Profile

Surveyed By: PJ
Designed By: DRL
Drawn By: JDH
Checked By: DRL
Project No: EC23-00-100.01
Date: November 2025

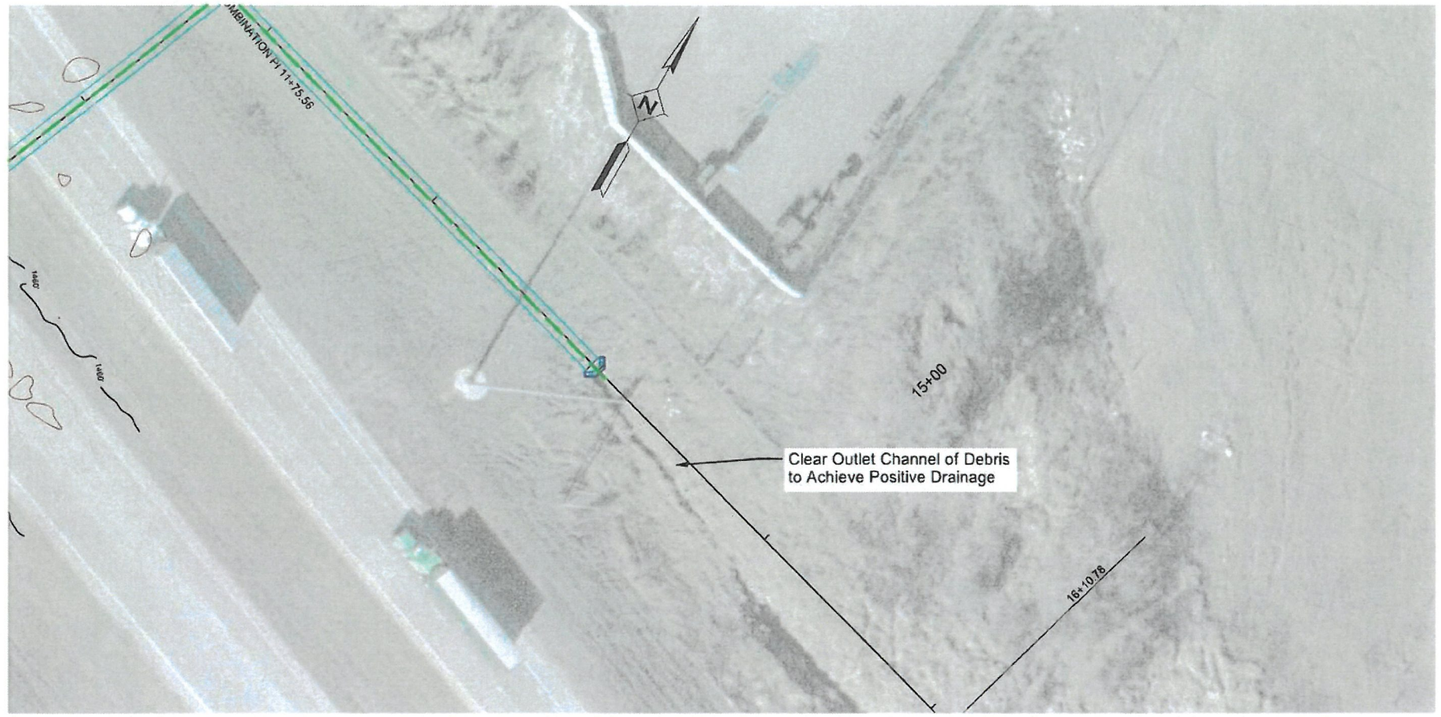
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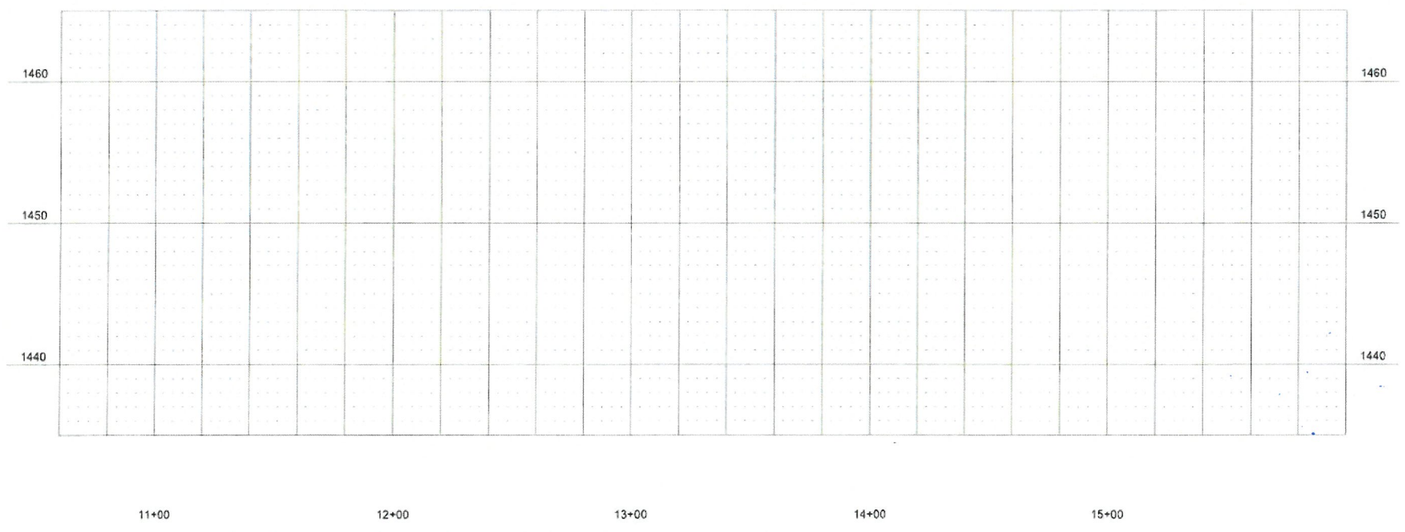
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2





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Rev No	Date	By	Description

96" Storm Sewer Replacement Project Phase 2 Segment II
City of Jamestown
Jamestown, North Dakota

Plan and Profile

Drawn By: ____ JDH
Checked By: ____ DRL
Surveyed By: ____ PJ
Designed By: ____ DRL
Project No: EC23-00-100.01
Date: ____ November 2025

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60
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3



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96" Storm Sewer Replacement Project Phase 2 Segment II
City of Jamestown
Jamestown, North Dakota

Temporary Erosion Control Layout

Drawn By: JLF | Surveyed By: PJ | Project No: EC23-00-100.01
Checked By: DRH | Designed By: JLF | Date: May 2025

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76
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Rev No	Date	By	Description

96" Storm Sewer Replacement Project Phase 2 Segment II
City of Jamestown
Jamestown, North Dakota

Permanent Erosion Control Layout

Drawn By: JLF | Surveyed By: PJ | Project No: EC23-00-100.01
Checked By: DRH | Designed By: JLF | Date: May 2025

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SECTION 77
SHEET 1



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96" Storm Sewer Replacement Project Phase 2 Segment II
City of Jamestown
Jamestown, North Dakota

Construction Signage

Drawn By:	BA	Surveyed By:	PJ
Checked By:	DRH	Designed By:	BA
		Project No:	EC23-00-100.01
		Date:	November 2025

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SECTION 100
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DETOUR
EAST
24TH ST SW

DETOUR
EAST
24TH ST SW

37th St SE

ND HWY 281

3rd Ave SW

DETOUR
24TH ST SW

STREET CLOSED
0.5 MILES AHEAD
LOCAL TRAFFIC ONLY

DETOUR
EAST
24TH ST SW

DETOUR

DETOUR
TO
24TH ST SW
MACS HARDWARE

DETOUR

N

0 100 200
SCALE IN FEET

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Rev No.	Date	By	Description

96" Storm Sewer Replacement Project Phase 2 Segment II
City of Jamestown
Jamestown, North Dakota

Construction Signage

Drawn By: BA | Surveyed By: PJ | Project No: EC23-00-100.01
Checked By: DRH | Designed By: BA | Date: November 2025

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96" Storm Sewer Replacement Project Phase 2 Segment II
City of Jamestown
Jamestown, North Dakota

Construction Signage

Drawn By:	BA	Surveyed By:	PJ
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Project No:	EC23-00-100.01		
Date:	November 2025		

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