CONTRACT DOCUMENTS

FOR

NORTH INDUSTRIES STREETS & STORMWATER

CITY OF DICKINSON, ND

Owner Project No. **202316**
Highlands Project No. **231223**

3/12/2025

Project Owner:
City of Dickinson, ND
38 1st Street W
Dickinson, ND 58601
Ph (701) 456-7744

Engineer & Owner Representative:
Highlands Engineering & Surveying, PLLC
319 24th Street East
Dickinson, ND 58601
Ph (701) 483-2444, Fax (701) 483-2610

C-001: CERTIFICATION

NORTH INDUSTRIES STREETS & STORMWATER
CITY OF DICKINSON, ND

Owner Project Number: 202316
Highlands Project Number: 231223

I hereby certify that this document was prepared by me or under my direct supervision and that I am a duly registered professional engineer under the laws of the State of North Dakota.

This document was originally issued and sealed by Andrew Schrank, PE, Registration Number PE-9814, on 3/12/2025, and the original document is stored at the office of Highlands Engineering.

Andrew Schrank, PE-9814,
Highlands Engineering & Surveying, PLLC

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CITY OF DICKINSON, ND

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Highlands Project Number: 231223

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C-111: ADVERTISEMENT FOR BIDS

NORTH INDUSTRIES STREETS & STORMWATER
CITY OF DICKINSON, ND

Owner Project Number: 202316
Highlands Project Number: 231223

General Notice

The **City of Dickinson, ND** (Owner) is requesting sealed Bids for the construction of the following Project:

North Industries Streets & Stormwater - Project Number 202316

Bids for the construction of the Project will be received at the office of **City Hall** to the attention of **Sylvia Miller** located at **38 1st Street W, Dickinson, ND 58601,** until **Friday**, **April 4, 2025** at **10:00 am MST**. At that time the Bids received will be publicly opened and read.

The Project includes the following general Work: **erosion control, grading, storm sewer system installation, cement soil stabilization, aggregate base, gravel surfacing, and asphalt pavement.**

Obtaining the Bidding Documents

The contract documents are on file and may be examined at the following locations:

- **City Hall**, **38 1st Street W, Dickinson, ND 58601**
- **Highlands Engineering, 319 24th Street E, Dickinson, ND 58601**

Complete digital project documents are available at the following designated website:

www.questcdn.com - Project Number 9578943

You may download the digital plan documents for **$22.00**. Please contact QuestCDN at (952) 233-1632 or info@questcdn.com for assistance in free membership registration, downloading, and working with this digital project information. Please contact Highlands Engineering at (701) 483-2444 if you have further questions.

Pre-bid Conference

A pre-Bid conference will be held at **1:00 pm MST** on **March 19, 2025** at **City Hall**. Interested bidders are encouraged to attend and participate in the conference. A Microsoft Teams virtual option will be available for interested bidders who are unable to attend in person. Please notify Sylvia Miller at Sylvia.Miller@dickinsongov.com no later than 5:00 pm MST the business day prior to the meeting, if you would like to attend virtually.

Instructions to Bidders

All bids are to be submitted on the basis of cash payment for the work and materials, and each bid shall include a bid security. The bid security must be in a sum equal to five percent (5%) of the full amount of the bid and must be in the form of a bidder's bond. A bidder's bond must be executed by the Bidder as principal and by a surety company authorized to do business in this state, conditioned that if the bid be accepted and the contract awarded to the Bidder, the Bidder, within ten (10) days after notice of award, will execute and effect a contract in accordance with the terms of his bid and the bid bond as required by the laws of the State of North Dakota and the regulations and determinations of the governing body.

If a successful Bidder does not execute a contract within ten (10) days allowed, the bidder's bond must be forfeited to the governing body and the project awarded to the next lowest responsible Bidder.

All Bidders must be licensed for the full amount of the Bid as required by Section 43-07-12 of the North Dakota Century Code.

All bids will be contained in a sealed envelope plainly marked showing that such envelope contains a bid for the above project. In addition, the Bidder shall place upon the exterior of such envelope the following information:

1. The name of the Bidder
2. Acknowledgement of any Addenda

The Bidder shall submit a separate sealed envelope containing the following information:

1. Bid security (5%)
2. Copy of North Dakota Contractor's License or Certificate of Renewal

No Bid will be read or considered which does not fully comply with the above provisions as to Bond and licenses, and any deficient Bid submitted will be resealed and returned to the Bidder immediately.

Contracts shall be awarded on the basis of the low bid submitted by a responsible and responsive Bidder for the aggregate sum of all bid items as defined in the Bidding Documents. The Owner reserves the right to reject any and all bids, to waive any informality in any bid, to hold all bids for a period not to exceed thirty (30) days from the date of opening bids, to accept the bid deemed most favorable to the interest of the Owner. If satisfactory bids are not received, the Owner reserves the right to rebid the project until a satisfactory bid is received.

The successful Bidder will be required to furnish Contract Performance and Payment Bonds in the full amount of the contract.

Contract Completion Date

The work on the improvements shall be substantially completed on or before **10/17/2025** and ready for final payment on or before **12/31/2025** in accordance with the Contract Documents.

Should the contractor fail to substantially complete the work within the time required herein, or within such extra time as may have been granted by formal extensions of time approved by the Owner, there will be deducted from any amount due the Contractor the sum of **$1300** per day and every day that the completion of the work is delayed. The Contractor and his surety will be liable for any excess. Such payment will be as and for liquidated damages.

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.

This Advertisement is issued by:

Owner: **City of Dickinson, ND**
By: **Dustin Dassinger - City Administrator**
Date: **3/12/2025**

Published: March 12th, March 19th, and March 26th of 2025

C-200: INSTRUCTIONS TO BIDDERS FOR CONSTRUCTION CONTRACT

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C-200: INSTRUCTIONS TO BIDDERS FOR CONSTRUCTION CONTRACT

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.

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.

1. Bidding Documents will be provided in Adobe PDF (Portable Document Format) (.pdf) that is readable by Adobe Acrobat Reader Version **6.0** and 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. After the Contract is awarded, the Owner will provide or direct the Engineer to provide for the use of the Contractor documents that were developed by Engineer as part of the Project design process, as Electronic Documents in native file formats.

1. Electronic Documents that are available in native file format include:

a. **Site Survey Linework in .dwg format**

b. **Proposed Site Conditions Linework and Alignments in .dwg format**

c. **Existing and Proposed ground surfaces in .xml format**

2. Release of such documents will be solely for the convenience of the Contractor. No such document is a Contract Document.

3. Unless the Contract Documents explicitly identify that such information will be available to the Successful Bidder (Contractor), nothing herein will create an obligation on the part of the Owner or Engineer to provide or create such information, and the Contractor is not entitled to rely on the availability of such information in the preparation of its Bid or pricing of the Work. In all cases, the Contractor shall take appropriate measures to verify that any electronic/digital information provided in Electronic Documents is appropriate and adequate for the Contractor's specific purposes.

4. In no case will the Contractor be entitled to additional compensation or time for completion due to any differences between the actual Contract Documents and any related document in native file format.

ARTICLE 3—QUALIFICATIONS OF BIDDERS

3.01 To demonstrate Bidder's qualifications to perform the Work, after submitting its Bid and within **seven (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. Subcontractor and Supplier qualification information.

C. Other required information regarding qualifications.

3.02 In an envelope separate from the envelope containing the Bid, Bidder is to submit the following information with its Bid to demonstrate Bidder's qualifications to perform the Work:

A. Copy of Bidder's contractor license or certificate of renewal.

B. Bid Security of 5% of the full amount of the bid in the form of a bidder's bond.

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

3.04 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 non-mandatory pre-bid conference will be held at the time and location indicated in the Advertisement. Representatives of Owner and Engineer will be present to discuss the Project. Bidders are encouraged to attend and participate in the conference; however, attendance at this conference is not required to submit a Bid.

4.02 Information presented at the pre-Bid conference does not alter the Contract Documents. Owner will issue Addenda to make any changes to the Contract Documents that result from discussions at the pre-Bid conference. Information presented, and statements made at the pre-bid conference will not be binding or legally effective unless incorporated in an Addendum.

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.

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. **Geotechnical Evaluation Report titled "North Industries Cement Stabilization 43rd Street West and 1st Avenue West, Dickinson, ND" completed by Braun Intertec Corporation with Project Number B2406649.07 dated 10/18/24**

2. **Report of Geotechnical Exploration titled "167975 North Industrial Park Dickinson, ND" completed by American Engineering Testing with Project Number P-0011133 dated 4/18/22**

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.

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

C. 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.

D. 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.

E. 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.

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. Submittals by mail shall: reference the Project Name and Project Number; include the name and contact information of the person and entity submitting the question; include the date the question was sent; include the question that is to be addressed; and shall be sent to the following address.

Highlands Engineering & Surveying, PLLC
ATTN: Andrew Schrank, PE
319 24th Street E
Dickinson, ND 58601

B. Submittals by email shall: reference the Project Name and Project Number in the subject line; shall include the name and contact information of the person and entity submitting the question; shall include the question that is to be addressed; and shall be sent to the following email address:

schrank@highlandseng.com

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 (7)** 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 **five percent (5%)** 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 and shall be submitted in an envelope separate from the envelope containing the Bid.

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 **ten (10)** 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 **31** 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 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.

ARTICLE 10—SUBSTITUTE AND "OR EQUAL" ITEMS

10.01 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. 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.

10.02 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 A Bidder must be prepared to retain specific Subcontractors and Suppliers for the performance of the Work if required to do so by the Bidding Documents or in the Specifications. If a prospective Bidder objects to retaining any such Subcontractor or Supplier and the concern is not relieved by an Addendum, then the prospective Bidder should refrain from submitting a Bid.

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. **Those requested by the City or their Engineer.**

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 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.

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.

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 The Bid must contain evidence of Bidder's licensure. According to Section 43-07-12 of the ND Century Code, a contractor must be the holder of a license at least ten days before the date set for receiving bids, to be a qualified bidder. A copy of North Dakota Contractor's License or Certificate of Renewal shall be submitted in an envelope separate from the envelope containing the Bid along with the required Bid Security.

ARTICLE 13—BASIS OF BID

13.01 *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.

13.02 *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.

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 in a sealed envelope. The required Bid security, a copy of the Contractor's license or certificate of renewal, and any other documents required to be submitted under the terms of Article 2 of the Bid Form shall be enclosed and submitted in a separate sealed envelope.

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 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 If within 24 hours after Bids are opened any Bidder files a duly signed written notice with Owner and promptly thereafter demonstrates to the reasonable satisfaction of Owner that there was a material and substantial mistake in the preparation of its Bid, the Bidder may withdraw its Bid, and the Bid security will be returned. Thereafter, if the Work is rebid, the Bidder will be disqualified from further bidding on the Work.

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.

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.

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 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.

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

C-410: 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 Hall
ATTN: Sylvia Miller
38 1st Street W
Dickinson, ND 58601

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. Contractor's license number as evidence of Bidder's State Contractor's License or a certificate of renewal;

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

3.01 *Unit Price Bids*

(Continued on next page)

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

NO.	DESCRIPTION	UNITS	EST. QTY.	UNIT PRICE	BID AMOUNT
1	CONTRACT BOND	LSUM	1	$	$
2	MOBILIZATION - ASPHALT PAVING	LSUM	1	$	$
3	MOBILIZATION - ALL OTHER ITEMS	LSUM	1	$	$
4	TRAFFIC CONTROL	LSUM	1	$	$
5	FIBER ROLLS 12IN	LF	132	$	$
6	TEMPORARY COVER CROP & MULCH	SY	1,463	$	$
7	PERMANENT SEED	SY	1,991	$	$
8	EROSION CONTROL BLANKET	SY	1,463	$	$
9	REMOVE & REPLACE LANDSCAPING	LSUM	1	$	$
10	RELOCATE SIGN OR MAILBOX	EA	4	$	$
11	REMOVE BITUMINOUS SURFACING	TON	544	$	$
12	REMOVE PIPE ALL TYPES AND SIZES	LF	178	$	$
13	REMOVAL OF CATCH BASIN	EA	1	$	$
14	COMMON EXCAVATION-WASTE	CY	1,946	$	$
15	TOPSOIL	CY	311	$	$
16	STORM SEWER CONNECTION	EA	1	$	$
17	STORM SEWER INLET-TYPE 1	EA	2	$	$
18	STORM SEWER MANHOLE-SHALLOW	EA	1	$	$
19	PIPE CONDUIT 12IN-STORM DRAIN	LF	65	$	$
20	PIPE CONDUIT 15IN-STORM DRAIN	LF	57	$	$
21	PIPE CONDUIT 18N-STORM DRAIN	LF	130	$	$
22	RCP END SECTION 15IN	EA	1	$	$
23	RCP END SECTION 18IN	EA	2	$	$
24	CMP CULVERT 18N	LF	66	$	$
25	CMP END SECTION 18IN	EA	2	$	$
26	CEMENT STABILIZATION 8IN - MAINLINE	SY	20,797	$	$
27	CEMENT STABILIZATION 8IN - DRIVEWAY	SY	3,296	$	$
28	PORTLAND CEMENT	TON	679	$	$
29	AGGREGATE BASE 4IN	TON	1,174	$	$
30	GRAVEL SURFACING 4IN	TON	5,019	$	$
31	ASPHALT PAVEMENT 4IN	TON	1242	$	$
32	ADJUST GATE VALVE	EA	20	$	$
33	ADJUST MANHOLE	EA	19	$	$
34	CHIMNEY SEAL	EA	2	$	$
TOTAL OF ALL UNIT PRICE BID ITEMS					$

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
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.

ARTICLE 4—TIME OF COMPLETION

4.01 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 calendar days indicated in the Agreement.

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

ARTICLE 5—BIDDER'S ACKNOWLEDGEMENTS: ACCEPTANCE PERIOD, INSTRUCTIONS, AND RECEIPT OF ADDENDA

5.01 *Bid Acceptance Period*

A. This Bid will remain subject to acceptance for 30 days after the Bid opening, or for such longer period of time that Bidder may agree to in writing upon request of Owner.

5.02 *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.

5.03 *Receipt of Addenda*

A. Bidder hereby acknowledges receipt of the following Addenda:

Addendum Number	Addendum Date

ARTICLE 6—BIDDER'S REPRESENTATIONS AND CERTIFICATIONS

6.01 *Bidder's Representations*

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

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

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.

6.02 *Bidder's Certifications*

A. The Bidder certifies the following:

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.

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) _____

C-430: BID BOND (PENAL SUM FORM)

Bidder	**Surety**
Name: _____	Name: _____
Address *(principal place of business)*:	Address *(principal place of business)*:
_____	_____
_____	_____
_____	_____
Owner	**Bid**
Name: **City of Dickinson, ND**	Project *(name and location)*:
Address *(principal place of business)*:	**North Industries Streets & Stormwater**
38 1st Street W	**Project Number 202316**
Dickinson, ND 58601	**City of Dickinson, ND**
	Bid Due Date: **April 4, 2025**
Bond	
Penal Sum: _____	
Date of Bond: _____	

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: _____	By: _____
(Signature)	*(Signature) (Attach Power of Attorney)*
Name: _____	Name: _____
(Printed or typed)	*(Printed or typed)*
Title: _____	Title: _____
Attest: _____	Attest: _____
(Signature)	*(Signature)*
Name: _____	Name: _____
(Printed or typed)	*(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.

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.

C-510: NOTICE OF AWARD

Date of Issuance:	**[ENTER DATE]**		
Owner:	**City of Dickinson, ND**	Owner's Project No.:	**202316**
Engineer:	**Highlands Engineering**	Engineer's Project No.:	**231223**
Project:	**North Industries Streets & Stormwater**		
Bidder:			
Bidder's Address:			

You are notified that Owner has accepted your Bid dated **April 4, 2025** for the above Contract, and that you are the Successful Bidder and are awarded a Contract for the above referenced project.

The Contract Price of the awarded Contract is **$** 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.

Three (3) 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 **Three (3)** 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): **None**

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 Dickinson, ND**

By *(signature)*: _____

Name *(printed)*: _____

Title: _____

Copy: Engineer

C-520: AGREEMENT BETWEEN OWNER AND CONTRACTOR FOR CONSTRUCTION CONTRACT (STIPULATED PRICE)

This Agreement is by and between **City of Dickinson, ND** ("Owner") and ("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: **erosion control, grading, storm sewer system installation, cement soil stabilization, aggregate base, gravel surfacing, and asphalt pavement.**

ARTICLE 2—THE PROJECT

2.01 The Project, of which the Work under the Contract Documents is a part, is generally described as follows: **North Industries Streets & Stormwater**

ARTICLE 3—ENGINEER

3.01 The Owner has retained **Highlands Engineering & Surveying, PLLC (a.k.a. Highlands 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 **Highlands Engineering & Surveying, PLLC (a.k.a. Highlands 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 **10/17/2025**, and completed and ready for final payment in accordance with Paragraph 15.06 of the General Conditions on or before **12/31/2025**.

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 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 **$1,300** 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. *Completion of Remaining Work:* After Substantial Completion, if Contractor shall neglect, refuse, or fail to complete the remaining Work within the Contract Times (as duly adjusted pursuant to the Contract) for completion and readiness for final payment, Contractor shall pay Owner **$130** for each day that expires after such time until the Work is completed and ready for final payment.

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.

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:

B. 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).

(Continued on next page)

NO.	DESCRIPTION	UNITS	EST. QTY.	Unit Price	Extended Price
1	CONTRACT BOND	LSUM	1		
2	MOBILIZATION - ASPHALT PAVING	LSUM	1		
3	MOBILIZATION - ALL OTHER ITEMS	LSUM	1		
4	TRAFFIC CONTROL	LSUM	1		
5	FIBER ROLLS 12IN	LF	132		
6	TEMPORARY COVER CROP & MULCH	SY	1,463		
7	PERMANENT SEED	SY	1,991		
8	EROSION CONTROL BLANKET	SY	1,463		
9	REMOVE & REPLACE LANDSCAPING	LSUM	1		
10	RELOCATE SIGN OR MAILBOX	EA	4		
11	REMOVE BITUMINOUS SURFACING	TON	544		
12	REMOVE PIPE ALL TYPES AND SIZES	LF	178		
13	REMOVAL OF CATCH BASIN	EA	1		
14	COMMON EXCAVATION-WASTE	CY	1,946		
15	TOPSOIL	CY	311		
16	STORM SEWER CONNECTION	EA	1		
17	STORM SEWER INLET-TYPE 1	EA	2		
18	STORM SEWER MANHOLE-SHALLOW	EA	1		
19	PIPE CONDUIT 12IN-STORM DRAIN	LF	65		
20	PIPE CONDUIT 15IN-STORM DRAIN	LF	57		
21	PIPE CONDUIT 18N-STORM DRAIN	LF	130		
22	RCP END SECTION 15IN	EA	1		
23	RCP END SECTION 18IN	EA	2		
24	CMP CULVERT 18N	LF	66		
25	CMP END SECTION 18IN	EA	2		
26	CEMENT STABILIZATION 8IN - MAINLINE	SY	20,797		
27	CEMENT STABILIZATION 8IN - DRIVEWAY	SY	3,296		
28	PORTLAND CEMENT	TON	679		
29	AGGREGATE BASE 4IN	TON	1,174		
30	GRAVEL SURFACING 4IN	TON	5,019		
31	ASPHALT PAVEMENT 4IN	TON	1,242		
32	ADJUST GATE VALVE	EA	20		
33	ADJUST MANHOLE	EA	19		
34	CHIMNEY SEAL	EA	2		
TOTAL OF ALL EXTENDED PRICES FOR UNIT PRICE WORK					

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.

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 on or about the **first or third Wednesday** of 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 previously made and less such amounts as Owner may withhold, including but not limited to liquidated damages, in accordance with the Contract.

a. **Ninety percent (90%)** of the value of the Work completed (with the balance being retainage).

b. **Ninety percent (90%)** of cost of materials and equipment not incorporated in the Work (with the balance being retainage).

B. Upon Substantial Completion, Owner shall pay an amount sufficient to increase total payments to Contractor to **one hundred percent (100%)** of the Work completed, less such amounts set off by Owner pursuant to Paragraph 15.01.E of the General Conditions, and less **two hundred percent (200%)** of Engineer's estimate of the value of Work to be completed or corrected as shown on the punch list of items to be completed or corrected prior to final payment.

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 rate of **six percent (6%)** percent per annum.

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 (copy of list attached).
6. Drawings listed on the attached sheet index.
7. Addenda (numbers ____ to ____, inclusive).
8. Geotechnical Report:
    a. Geotechnical Evaluation Report titled "North Industries Cement Stabilization 43rd Street West and 1st Avenue West, Dickinson, ND" completed by Braun Intertec Corporation with Project Number B2406649.07 dated 10/18/24
9. Exhibits to this Agreement (enumerated as follows):
    a. None
10. 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.

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 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.

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.

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

This Agreement will be effective on (which is the Effective Date of the Contract).

Owner:	Contractor:
City of Dickinson, ND *(typed or printed name of organization)*	_____ *(typed or printed name of organization)*
By: _____ *(individual's signature)*	By: _____ *(individual's signature)*
Date: _____ *(date signed)*	Date: _____ *(date signed)*
Name: _____ *(typed or printed)*	Name: _____ *(typed or printed)*
Title: _____ *(typed or printed)*	Title: _____ *(typed or printed)* *(If **Contractor** is a corporation, a partnership, or a joint venture, attach evidence of authority to sign.)*
Attest: _____ *(individual's signature)*	Attest: _____ *(individual's signature)*
Title: _____ *(typed or printed)*	Title: _____ *(typed or printed)*
Address for giving notices:	Address for giving notices:
_____	_____
_____	_____
_____	_____
Designated Representative:	Designated Representative:
Name: _____ *(typed or printed)*	Name: _____ *(typed or printed)*
Title: _____ *(typed or printed)*	Title: _____ *(typed or printed)*
Address:	Address:
_____	_____
_____	_____
_____	_____
Phone: _____	Phone: _____
Email: _____	Email: _____
	License No.: _____ *(where applicable)*
	State: _____

C-550: NOTICE TO PROCEED

Owner:	**City of Dickinson, ND**	Owner's Project No.:	**202316**
Engineer:	**Highlands Engineering**	Engineer's Project No.:	**231223**
Contractor:		Contractor's Project No.:	
Project:	**North Industries Streets & Stormwater**		
Effective Date of Contract:			

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

On this 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:

The date by which Substantial Completion must be achieved is **10/17/2025**, and the date by which readiness for final payment must be achieved is **12/31/2025**.

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

_____

_____

_____

_____

Owner: **City of Dickinson, ND**

By *(signature)*: _____

Name *(printed)*: _____

Title: _____

Date Issued: _____

Copy: Engineer

C-610: PERFORMANCE BOND

Contractor	**Surety**
Name:	Name _____
Address *(principal place of business)*:	Address *(principal place of business)*: _____ _____ _____
Owner	**Contract**
Name: **City of Dickinson, ND**	Description *(name and location)*:
Mailing address *(principal place of business)*:	**North Industries Streets & Stormwater**
38 1st Street W	**Project Number 202316**
Dickinson, ND 58601	**City of Dickinson, ND**
	Contract Price: **$**
	Effective Date of Contract:

Bond

Bond Amount: _____

Date of Bond: _____ *(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: _____	By: _____
(Signature)	*(Signature)(Attach Power of Attorney)*
Name: _____	Name: _____
(Printed or typed)	*(Printed or typed)*
Title: _____	Title: _____
Attest: _____	Attest: _____
(Signature)	*(Signature)*
Name: _____	Name: _____
(Printed or typed)	*(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.

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:

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 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, below, or enter "None"]**

C-615: PAYMENT BOND

Contractor	**Surety**
Name:	Name: _____
Address *(principal place of business)*:	Address *(principal place of business)*: _____ _____ _____
Owner	**Contract**
Name: **City of Dickinson, ND**	Description *(name and location)*:
Mailing address *(principal place of business)*: **38 1st Street W** **Dickinson, ND 58601**	**North Industries Streets & Stormwater** **Project Number 202316** **City of Dickinson, ND**
	Contract Price: **$**
	Effective Date of Contract:

Bond

Bond Amount: _____

Date of Bond: _____ *(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: _____	By: _____
(Signature)	*(Signature)(Attach Power of Attorney)*
Name: _____	Name: _____
(Printed or typed)	*(Printed or typed)*
Title: _____	Title: _____
Attest: _____	Attest: _____
(Signature)	*(Signature)*
Name: _____	Name: _____
(Printed or typed)	*(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.

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.

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;

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, below, or enter "None"]**

C-625: CERTIFICATE OF SUBSTANTIAL COMPLETION

Owner:	**City of Dickinson, ND**	Owner's Project No.:	**202316**
Engineer:	**Highlands Engineering**	Engineer's Project No.:	**231223**
Contractor:		Contractor's Project No.:	
Project:	**North Industries Streets & Stormwater**		

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

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

Date of Substantial Completion: **[ENTER DATE]**

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:

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

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

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: _____

C-626: NOTICE OF ACCEPTABILITY OF WORK

Owner:	**City of Dickinson, ND**	Owner's Project No.:	**202316**
Engineer:	**Highlands Engineering**	Engineer's Project No.:	**231223**
Contractor:		Contractor's Project No.:	
Project:	**North Industries Streets & Stormwater**		
Notice Date:	**[ENTER 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 **[ENTER DATE]** ("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:

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.

This Notice reflects and is an expression of the Engineer's professional opinion.

This Notice has been prepared to the best of Engineer's knowledge, information, and belief as of the Notice Date.

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.

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.

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: _____

C-700: STANDARD GENERAL CONDITIONS OF THE CONSTRUCTION CONTRACT

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C-700: 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

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

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.

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.

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.

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.

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

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.

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

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.

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

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.

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.

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

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.

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

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;

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

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

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

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

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

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.

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);

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

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.

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.

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;

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.

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.

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.

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 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 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.

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.

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.

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.

   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;

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.

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 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 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.

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.

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.

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.

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.

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:

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.

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

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

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

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

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.

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

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

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.

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,

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,

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

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.

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;

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

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:

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

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.

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.

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 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.

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 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.

C-800: SUPPLEMENTARY CONDITIONS OF THE CONSTRUCTION CONTRACT

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C-800: 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 Supplementary Conditions in this Article.

ARTICLE 2—PRELIMINARY MATTERS

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 **two (2)** printed copies of the Contract Documents (including one fully signed counterpart of the Agreement), and **one (1) c**opy in electronic portable document format (PDF).

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.

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 **$160** 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

No Supplementary Conditions in this Article.

ARTICLE 4—COMMENCEMENT AND PROGRESS OF THE WORK

SC-4.03 Reference Points

SC-4.03 Delete Paragraph 2.05.A in its entirety and insert the following in its place:

A. Engineer will provide and set construction stakes and marks that establish lines, slopes, grades, and other engineering details which in Engineer's judgment are necessary to enable Contractor to properly construct the Work. Notify Engineer at least 48 hours prior to the need for staking excluding Saturdays, Sundays, and Holidays. If the Contractor destroys or

disturbs stakes or marks, the Engineer will repair or replace the stakes and marks and will deduct the cost of repair or replacement from monies due or to become due the Contractor.

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:

Report Title	Date of Report	Technical Data
None Available		

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:

Drawings Title	Date of Drawings	Technical Data
None Available		

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 **the Office of Highlands Engineering located at 319 24th Street E, Dickinson, ND 58601** 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:

Report Title	Date of Report	Technical Data
None Available		

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:

Drawings Title	Date of Drawings	Technical Data
None Available		

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).

6.03 *Contractor's Insurance*

SC-6.03 Supplement Paragraph 6.03 with the following provisions after Paragraph 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	N/A
Bodily injury by disease—aggregate	N/A
Employer's Liability	
Each accident	$1,000,000
Each employee	$1,000,000
Policy limit	$2,000,000
Stop-gap Liability Coverage	
The Commercial General Liability policy shall include a "stop-gap" Employer's Liability endorsement to cover the employer's liability for injury to employees which fall outside of the State's Worker's Compensation Law.	

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:

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	$2,000,000
Products—Completed Operations Aggregate	$2,000,000
Personal and Advertising Injury	$1,000,000
Bodily Injury and Property Damage—Each Occurrence	$1,000,000

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	$1,000,000
Each Accident	$1,000,000
Property Damage	
Each Accident	$2,000,000

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	$1,000,000
General Aggregate	$2,000,000

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 **$2,000,000** 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	N/A
General Aggregate	N/A

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	N/A
Annual Aggregate	N/A

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.

No special requirements exist.

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

Q. *Other Required Insurance:* **None**

6.04 *Builder's Risk and Other Property Insurance*

SC-6.04 Delete Section 6.04.A in its entirety

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 **9:00 PM** local time.
2. Owner's legal holidays are: New Year's Day (Jan. 1); Martin Luther King Jr. Day (3rd Monday of Jan.); President's Day (3rd Monday of Feb.); Good Friday (Friday before Easter Sunday); Memorial Day (last Monday in May); Independence Day (July 4); Labor Day (first Monday in Sept.); Veteran's Day (Nov. 11); Thanksgiving Day (fourth Thursday in Nov.); and Christmas Day (Dec. 25). If Jan. 1, July 4, Nov. 11, or Dec 25 fall on a Sunday, the following Monday is a holiday. If Jan. 1, July 4, Nov. 11, or Dec 25 fall on a Saturday, the preceding Friday is a holiday**.**

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."

ARTICLE 8—OTHER WORK AT THE SITE

No Supplementary Conditions in this Article.

ARTICLE 9—OWNER'S RESPONSIBILITIES

No Supplementary Conditions in this Article.

ARTICLE 10—ENGINEER'S STATUS DURING CONSTRUCTION

10.03 *Resident Project Representative*

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*

    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.

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 Supplementary Conditions in this Article.

ARTICLE 12—CLAIMS

No Supplementary Conditions in this Article.

ARTICLE 13—COST OF WORK; ALLOWANCES, UNIT PRICE WORK

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 **five percent (5%)** 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 **twenty-five percent (25%)** 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.

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 Supplementary Conditions in this Article.

ARTICLE 15—PAYMENTS TO CONTRACTOR, SET OFFS; COMPLETIONS; CORRECTION PERIOD

15.01 *Progress Payments*

SC-15.01.D Payment Becomes Due

Delete Paragraph 15.01.D.1 in its entirety and insert the following in its place:

1. Thirty (30) days after the presentation of the Application for Payment to Owner with Engineer's recommendations and Owner concurrence, the amount recommended (subject to any Owner setoffs) will become due and will be paid by the Owner to the Contractor.

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.

ARTICLE 16—SUSPENSION OF WORK AND TERMINATION

No Supplementary Conditions in this Article.

ARTICLE 17—FINAL RESOLUTIONS OF DISPUTES

17.02 *Arbitration*

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;

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.

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.

STANDARD TECHNICAL SPECIFICATIONS
and
STANDARD DETAIL DRAWINGS
for
MUNICIPAL PUBLIC WORKS IMPROVEMENTS

CITY OF DICKINSON, NORTH DAKOTA

Prepared by
City of Dickinson
Engineering Department
99 2nd Street East
Dickinson, ND 58601

This document was originally issued and sealed by Andrew Schrank, Registration Number PE-9814, on 03/12/2025
The original document is stored at the office of Highlands Engineering.

Adopted by the City of Dickinson in December 2017
By Ordinance XXXX

NOTE/DISCLAIMER

The standards represented in this document are in accordance with established City of Dickinson practices and are an electronic facsimile of the standards on file in the City of Dickinson Engineering Department. However, neither the City of Dickinson nor its employees can or do warranty these standards to be the complete standards for any or all City of Dickinson construction projects.

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CITY OF DICKINSON STANDARD SPECIFICATIONS

SECTION 01 0130

SUBMITTALS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Submittal procedures, schedules, lists and instructions for proper and prompt submittal and review of construction related documents.

1.2 SUBMITTAL PROCEDURES

A. Transmit each submittal in accordance with Engineer’s accepted format.

B. Identify Project Name and City Project Number, Contractor, Subcontractor or Supplier, pertinent drawing and detail number, and specification section number, as appropriate.

C. Apply Contractor's stamp, signed or initialed certifying that review, verification of products required, field dimensions, adjacent construction work, and coordination of information, is in accordance with the requirements of the Work and Contract Documents.

D. Schedule submittals to expedite the Project, and deliver to Engineer at business address.

E. Coordinate submission of related items.

F. For each submittal, allow 15 working days for review, excluding delivery time to and from the Contractor.

G. Identify variations from Contract Documents and product or system limitations that may be detrimental to successful performance of the completed Work.

H. Provide space for Contractor and Engineer review stamps.

I. If directed to revise and resubmit, identify all changes made since previous submission.

J. Distribute copies of reviewed submittals as appropriate. Instruct parties to promptly report any inability to comply with provisions.

K. Submittals not requested will not be recognized or processed.

1.3 CONSTRUCTION PROGRESS SCHEDULES

A. Submit preliminary schedule in duplicate within 10 days after effective date of the Agreement.

B. Revise and resubmit as required.

C. Submit revised schedules with each Application for Payment, identifying changes since previous version.

D. Show complete sequence of construction by activity, identifying Work of separate stages and other logically grouped activities.

E. Indicate estimated percentage of completion for each item of work at each submission.

F. Indicate submittal dates required for shop drawings, product data, samples, and product delivery dates.

1.4 PROPOSED PRODUCTS LIST

A. Within 10 days after effective date of the Agreement, submit list of major products proposed for use, with name of manufacturer, trade name, and model number of each product.

B. For products specified only by reference standards, give manufacturer, trade name, model or catalog designation, and reference standards.

1.5 SUBMITTALS FOR REVIEW

A. When the following are specified in individual sections, submit them for review:
   1. Product data.
   2. Shop drawings.
   3. Samples for selection.
   4. Samples for verification.

B. Submit to Engineer for review for the limited purpose of checking for conformance with information given and the design concept expressed in the Contract Documents.

   1. Shop Drawings and proposed products intended for incorporation in the Work, including fabrication and installation drawings, setting diagrams, schedules, patterns, templates and similar drawings. Include the following information:
      a. Prepare accurate, drawn-to-scale, original shop drawing documentation by interpreting the Contract Documents and coordinating related Work.
      b. Identify Project, Contractor, Subcontractor or supplier; pertinent drawing and detail number, and specification section number, as appropriate on each copy.
      c. Apply Contractor's stamp, signed or initialed certifying that review, approval, verification of Products required, field dimensions, adjacent construction Work, and coordination of information is in accordance with the requirements of the Work and Contract Documents.
      d. Schedule submittals to expedite the Project, and coordinate submission of related items.
      e. For each submittal for review, allow 15 days excluding delivery time to and from the Contractor.
      f. Identify variations from Contract Documents and Product or system limitations that may be detrimental to successful performance of the completed Work.
      g. Distribute reviewed submittals as appropriate. Instruct parties to promptly report any inability to comply with requirements.
      h. Provide space for Contractor and Engineer review stamps.
      i. If directed to revise and resubmit, identify all changes made since previous submission.
      j. Submittals not requested will not be recognized or processed.
      k. Sheet Size: Except for templates, patterns and similar full- size Drawings, submit Shop Drawings on sheets at least 8-1/2" x 11" but no larger than 24" x 36".
      l. Submittal: Submit one electric copy for the Engineer's concurrent review.
      m. Do not use Shop Drawings without an appropriate final stamp indicating action taken in connection with construction.
      n. Engineer shall not proceed with Shop Drawing review without prior review and approval by Contractor.

C. Samples will be reviewed only for aesthetic, color, or finish selection.

   1. Submit full-size, fully fabricated Samples cured and finished as specified and physically identical to the material or product proposed. Samples include partial sections of manufactured or fabricated components, cuts or containers of materials, color range sets, and swatches showing color, texture and pattern.
      a. Submit Samples for review of kind, color, pattern, and texture, for a final check of these characteristics with other elements, and for a comparison of these characteristics between the final submittal and the actual component as delivered and installed.
         1) Where variation in color, pattern, texture or other characteristics are inherent in the material or product represented, submit multiple units (not less than 3), that show approximate limits of the variations.
      b. Preliminary submittals: Where Samples are for selection of color, pattern, texture or similar characteristics from a range of standard choices, submit a full set of choices for the material or product.

1) Preliminary submittals will be reviewed and returned with the Engineer's mark indicating selection and other action.

2. Maintain sets of Samples, as returned, at the Project site, for quality comparisons throughout the course of construction.

1.6 MANUFACTURER INSTALLATION INSTRUCTIONS

A. When required, submit printed instructions for delivery, storage, assembly, installation, start-up, adjusting, and finishing, to Engineer.

B. Indicate special procedures, perimeter conditions requiring special attention, and special environmental criteria required for application or installation.

1.7 MANUFACTURER CERTIFICATES

A. When specified in individual specification sections, submit manufacturer certification to Engineer.

B. Indicate material or product conforms to or exceeds specified requirements. Submit supporting reference data, affidavits, and certifications as appropriate.

C. Certificates may be recent or previous test results on material or product, but must be acceptable to Engineer.

PART 2 NOT APPLICABLE

PART 3 NOT APPLICABLE

PART 4 MEASUREMENT AND PAYMENT

4.1 All work described herein is incidental to other related items of work and no measurement or additional payment will be considered.

END OF SECTION

SECTION 01 0390

COORDINATION AND MEETINGS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Coordination, field engineering, preconstruction meeting, progress meetings, and examination.

1.2 COORDINATION

A. Coordinate scheduling, submittals, and Work of the various sections of the Project Manual to assure efficient and orderly sequence of installation of interdependent construction elements.

B. Include the City of Dickinson in all coordination and meetings.

1.3 FIELD ENGINEERING

A. Contractor shall protect survey monuments, control, property corners and reference points, and shall notify Engineer immediately if any such items are disturbed. Any survey monuments, control, property corners and reference points destroyed by Contractor will be reset by Engineer at the expense of the Contractor. Contractor shall allow a minimum of 48 hours for Engineer to complete such resetting or replacement.

B. Verify setbacks and easements, confirm drawing dimensions and elevations.

C. The Engineer will provide field engineering services and establish elevations, lines, and levels, utilizing recognized engineering survey practices.

1.4 PRECONSTRUCTION MEETING

A. The Engineer shall schedule and conduct the Pre-Construction Meeting and shall be responsible for preparing an agenda, recording discussions and distributing the meeting minutes.

B. Attendees shall include, at a minimum, the City, Contractor, Engineer and Major Sub-Contractors.

1.5 PROGRESS MEETINGS

A. The Engineer shall schedule and conduct Construction Progress Meetings and shall be responsible for preparing an agenda, recording discussions and distributing the meeting minutes. These meetings will be held every other week, or more frequently as needed.
   1. Minimum Agenda - Construction Progress Meeting:
      a. Review, revise as necessary, and approve minutes of previous meeting(s).
      b. Review progress of the work since last meeting, including status of submittals for approval.
      c. Identify problems which will impede planned progress.
      d. Develop corrective measures and procedures to regain planned schedule.
      e. Complete other current business.
      f. Three week Look-Ahead Schedule.
      g. Schedule of the next meeting.

B. Minimum Attendance Required:
   1. Contractor.
   2. City of Dickinson.
   3. Contractor's Superintendent.
   4. Major Subcontractors.
   5. Engineer.

C. The Engineer shall schedule and conduct special Construction Administration meetings including Pre-Installation meetings on critical systems and assemblies and other meetings as deemed necessary.

PART 2 NOT USED

PART 3 NOT USED

PART 4 NOT USED

END OF SECTION

SECTION 01 4001

QUALITY CONTROL

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Instructions and requirements for quality assurance and quality control of installation.

1.2 REFERENCES

A. For products or workmanship specified by association, trade, or other consensus standards, comply with requirements of the standard, except when more rigid requirements are specified or are required by applicable codes.

B. Conform to reference standard by date of issue current on date for receiving bids, except where a specific date is established by code.

C. Obtain copies of standards where required by product specification sections.

D. The contractual relationship, duties, and responsibilities of the parties in the contract nor those of the Engineer will not be altered from the Contract Documents by mention or inference otherwise in any reference document.

1.3 SUBMITTALS

A. Submit a certified written report of each inspection, test or similar service, to the Engineer, in duplicate, within 48 hours after results have been obtained.

B. Submit additional copies of each written report directly to the City.

1.4 QUALITY ASSURANCE

A. Monitor quality control over Suppliers, Manufacturers, Products, services, site conditions, and workmanship, to produce Work of specified quality.

B. Comply with Manufacturer’s instructions, including each step in the sequence.

C. Should Manufacturer’s instructions conflict with Contract Documents, request clarification from Engineer before proceeding.

D. Comply with specified standards as minimum quality for the Work except where more stringent tolerances, codes, or specified requirements indicate higher standards or more precise workmanship.

E. Perform work by persons qualified to produce workmanship of specified quality.

F. Secure products in place with positive anchorage devices designed and sized to withstand stresses, vibration, physical distortion, or disfigurement.

PART 2 NOT APPLICABLE

PART 3 EXECUTION

3.1 INSPECTION AND TESTING LABORATORY SERVICES

A. Contractor shall engage and pay for the services of an independent agency to perform specified quality control and testing services. Employment of agency in no way relieves Contractor of obligation to perform Work in accordance with requirements of Contract Documents.

B. Where the City has engaged a testing agency or other entity for testing and inspection of a part of the Work and the Contractor is also required to engage an entity for the same or related element, Contractor shall not employ the entity engaged by the City, unless otherwise agreed in writing with the City.

3.2 DUTIES OF INDEPENDENT TESTING AGENCY

A. Perform inspections, sampling and testing of materials and construction specified with qualified personnel.

B. Cooperate with and notify the Engineer and Contractor promptly of irregularities or deficiencies observed in the work during performance of its services.

C. Testing agency is not authorized to release, revoke, alter or enlarge requirements of the Contract Documents, or approve or accept any portion of the Work or perform any duties of the Contractor.

3.3 ASSOCIATED SERVICES

A. Cooperate with agencies performing required inspections, tests and similar services and provide reasonable auxiliary services as requested. Notify the agency sufficiently in advance of operations to permit assignment of personnel. Auxiliary services required include but are not limited to:
   1. Providing access to the Work and furnishing incidental labor and facilities necessary to facilitate inspections and tests.
   2. Taking adequate quantities of representative samples of materials that require testing or assisting the agency in taking samples.
   3. Providing facilities for storage and curing of test samples, and delivery of samples to testing laboratories.
   4. Providing the agency with a preliminary design mix proposed for use for materials mixes that require control by the testing agency.
   5. Security and protection of samples and test equipment at the project site.

3.4 REPORT DATA

A. Date of issue.

B. Project title and number.

C. Name, address and telephone number of testing agency.

D. Dates and locations of sample and tests or inspections.

E. Names of individuals making the inspection or test.

F. Designation of the Work and test method.

G. Identification of product and specification section.

H. Complete inspection or test data.

I. Test results and an interpretation of test results.

J. Ambient conditions at the time of sample taking and testing.

K. Comments or professional opinion as to whether inspected or tested Work complies with Contract Document requirements.

L. Name and signature of laboratory inspector.

M. Recommendations on retesting.

3.5 MANUFACTURER'S FIELD SERVICES AND REPORTS

A. When specified in individual specification sections, require material or product Suppliers or Manufacturers to provide qualified staff personnel to observe site conditions, conditions of surfaces and installation, quality of workmanship, start-up of equipment, test, adjust and balance of equipment as applicable, and to initiate instructions when necessary.

B. Submit qualifications of observer to Engineer in advance of required observations. Observer subject to approval of Engineer.

C. Report observations and site decisions or instructions given to applicators or installers that are supplemental or contrary to Manufacturer's written instructions.

D. Submit report within 30 days of observation to Engineer for information.

3.6 TOLERANCES

A. Monitor tolerance control of installed products to produce acceptable Work. Do not permit tolerances to accumulate.

B. Comply with Manufacturer's tolerances.

C. Adjust products to appropriate dimensions; position before securing products in place.

3.7 COORDINATION AND SCHEDULING

A. Coordinate the sequence of activities to accommodate required services with a minimum of delay and avoid the necessity of removing and replacing construction to accommodate inspections and tests.

B. Responsible for scheduling times for inspections, tests, taking samples and similar activities.

3.8 RETESTING

A. The Contractor is responsible for retesting where results of required inspections, tests or similar services prove unsatisfactory and do not indicate compliance with Contract Document requirements, regardless of whether the original test was the Contractor's responsibility.

B. Cost of retesting construction revised or replaced by the Contractor is the Contractor's responsibility, where required tests were performed on original construction.

C. If additional testing is specifically requested by the City or Engineer more than the number of tests required per the Contract documents, responsibility for payment shall be as follows:
   1. If an additional requested test fails, the Contractor shall be responsible for all costs associated with the test and any subsequent testing required to obtain a passing test.
   2. If an additional requested test passes, the City shall be responsible for all costs associated with the test.

3.9 DEFECT ASSESSMENT

A. No products, materials or equipment that fails to meet the requirements of the Contract Documents shall be incorporated into the work. Replace Work or portions of the Work not conforming to the specified requirements.

B. If, in the opinion of the City, it is not practical to remove and replace the Work, the City may, on a case-by-case basis and at their discretion, direct an appropriate remedy or adjust payment.

PART 4 MEASUREMENT AND PAYMENT

4.1 All work required herein is incidental to other related work. No measurements or additional payments will be made for work defined herein.

END OF SECTION

SECTION 01 5001

CONSTRUCTION FACILITIES AND TEMPORARY CONTROLS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Guidelines, directions, and descriptions to temporary utilities, including electricity, lighting, heat, ventilation, telephone service, water and sanitary facilities.

B. Temporary controls that cover Contractor's responsibilities in terms of barriers and temporary protection of the work during construction.

C. Construction Facilities: Progress cleaning

1.2 REFERENCES

A. OSHA Publications:
   1. No. 3007 Ground Fault Protection on Construction Sites
   2. No. 3106 Concrete and Masonry
   3. No. 3115 Underground Construction
   4. No. 3124 Stairs and Ladders
   5. No. 2226 Excavation and Trenching Operations

PART 2 NOT APPLICABLE

PART 3 EXECUTION

3.1 TEMPORARY FACILITIES

A. Electricity: If available and adequate, Owner's existing power service may be utilized during construction. Do not disrupt Owner's need for continual service.
   1. Owner’s permanent convenience receptacles may be utilized during construction.
   2. Owner’s permanent building lighting may be utilized during construction.

B. Heat: Existing heating system, if available, may be utilized during construction. If not available provide temporary heat for construction and protection of facilities.

C. Ventilation: Ventilate enclosed areas to assist cure of materials, dissipate humidity and prevent accumulation of dust, fumes, vapors or gases.
   1. Extend and supplement existing equipment with temporary fan units as required to maintain clean air for construction operations.
   2. Provide additional fans as needed.
   3. During winter heating season use conservation measures to reduce heat loss.

D. Telephone Service: Provide and maintain telephone service, if required.

E. Water Service: Existing water system (if available) may be utilized during construction. Utilize measures to conserve water. If not available, provide temporary supply for potable use, sanitation and construction.

F. Sanitary Facilities: Existing restroom facility (if available) may be utilized during construction. If not available, provide temporary sanitary facilities for workers.

G. Safety Barriers: Provide safety barriers to prevent unauthorized entry into construction areas and allow for Owner's use of site if required.

H. Field Office: If required, provide a clean, weather tight structure with necessary electrical and mechanical equipment and a drawing table and chair. Locate as directed by Engineer in the field.

3.2 SECURITY

A. Provide security, as needed, to protect finished work, existing facilities and adjacent property as well as Owner's operations, from unauthorized entry, vandalism, or theft.

3.3 PROGRESS CLEANING AND WASTE REMOVAL

A. Maintain areas free of waste materials, debris and rubbish. Maintain site in a clean and orderly condition by cleaning up at the end of every working day.

B. Remove debris and rubbish from all areas and other remote closed spaces by brooming or vacuum prior to enclosing the space or equipment.

C. Broom and vacuum clean interior areas that support traffic to minimize dust.

3.4 FIELD OFFICE AND STORAGE AREA

A. If unused space is available on site Contractor may use it for office and storage space. Space must be coordinated and approved by Owner.

B. Areas designated for storage must be secured by contractor. Sensitive or hazardous materials shall not be brought on site without the written consent of Owner.

3.5 SITE DRAINAGE

A. Grade site to drain.

B. Keep excavations free of water. Provide, operate and maintain pumping equipment as needed.

C. Provide erosion control and protection as needed.

3.6 PROTECTION OF FINISHED WORK

A. Control activity in work area to prevent damage.

B. Provide temporary and removable protection for installed products.

C. Protect finished floors, walls and other surfaces from traffic, dirt, wear and damage by covering with durable sheet materials.

D. Prohibit traffic from landscape areas and other areas that require time to cure.

3.7 REMOVAL OF UTILITIES, FACILITIES AND CONTROLS

A. Remove temporary utilities, equipment, facilities and materials prior to final application for payment.

B. Clean and repair damage caused by construction or use of temporary work.

C. Restore existing facilities used during construction to original condition.

PART 4 MEASUREMENT AND PAYMENT

4.1 All work required herein is incidental to other related items of work and no additional measurement or payment will be made.

END OF SECTION

SECTION 01 5227

SLOPE PROTECTION AND EROSION CONTROL

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Erosion control measures required to minimize soil erosion by wind and washing during construction.

1.2 REFERENCES

A. U.S. Dept. of Natural Resources and Conservation (formerly USDA SCS).

B. North Dakota Department of Health, Division of Water Quality.

1.3 PERFORMANCE REQUIREMENTS

A. Develop and follow an Erosion and Sedimentation Prevention Plan and submit periodic inspection reports in accordance with the SWPPP requirements.

B. Do not begin clearing, grading, or other work involving disturbance of ground surface cover until applicable permits have been obtained; furnish all documentation required to obtain applicable permits.
   1. Obtain and pay for permits and provide security required by authority having jurisdiction.
   2. City will withhold payment to Contractor equivalent to all fines resulting from non-compliance with applicable regulations.

C. Timing: Put preventive measures in place as soon as possible after disturbance of surface cover and before precipitation occurs.

D. Storm Water Runoff: Control increased storm water runoff due to disturbance of surface cover due to construction activities for this project.
   1. Prevent runoff of sediment-laden water into storm and sanitary sewer systems, including open drainage channels, in excess of actual capacity or amount allowed by authorities having jurisdiction, whichever is less.

E. Erosion On-Site: Minimize wind, water, and vehicular erosion of soil on project site due to construction activities for this project.
   1. Control movement of sediment and soil from temporary stockpiles of soil.
   2. Prevent development of ruts due to equipment and vehicular traffic.
   3. If erosion occurs due to non-compliance with these requirements, restore eroded areas at no cost to City.

F. Erosion Off Site: Prevent erosion of soil and deposition of sediment on other properties caused by water leaving the project site due to construction activities for this project.
   1. Prevent windblown soil from leaving the project site.
   2. Prevent tracking of mud onto public roads outside site.
   3. Prevent mud and sediment from flowing onto sidewalks and pavements.
   4. If erosion occurs due to non-compliance with these requirements, restore eroded areas at no cost to City.

G. Sedimentation of Waterways On Site: Prevent sedimentation of waterways on the project site, including rivers, streams, lakes, ponds, open drainage ways, storm sewers, and sanitary sewers.
   1. If sedimentation occurs, install or correct preventive measures immediately at no cost to City; remove deposited sediments; comply with requirements of authorities having jurisdiction.
   2. If sediment basins are used as temporary preventive measures, pump dry and remove deposited sediment after each storm.

H. Sedimentation of Waterways Off Site: Prevent sedimentation of waterways off the project site, including rivers, streams, lakes, ponds, open drainage ways, storm sewers, and sanitary sewers.
   1. If sedimentation occurs, install or correct preventive measures immediately at no cost to City; remove deposited sediments; comply with requirements of authorities having jurisdiction.

I. Open Water: Prevent standing water that could become stagnant.

J. Maintenance: Maintain temporary preventive measures until permanent measures have been established.

1.4 SUBMITTALS

A. A detailed plan defining, in writing, how erosion will be controlled at all times beginning with initial move on project site and ending 1 year after planted seed and/or vegetation have been planted and are growing.

B. Address procedures to follow after the Contractor has left the site and erosion develops.

1.5 ENVIRONMENTAL REQUIREMENTS

A. Use environmentally safe erosion control measures as approved by the North Dakota Department of Health, Division of Water Quality.

PART 2 PRODUCTS

2.1 MATERIALS

A. Grass Seed for Temporary Cover: Select a species appropriate to climate, planting season, and intended purpose. If same area will later be planted with permanent vegetation, do not use species known to be excessively competitive or prone to volunteer in subsequent seasons.

B. Bales: Air dry, rectangular straw bales.

C. Fiber Rolls (Straw Wattles):
   1. 9 inch, North American Green WS925, AEC Premier Straw Wattles, or approved equal.

D. Bale Stakes: One of the following, minimum 3 feet (1 m) long:
   1. Steel U- or T-section, with minimum mass of 1.33 lb per linear foot (1.98 kg per linear m).
   2. Wood, 2 by 2 inches (50 by 50 mm) in cross section.

E. Silt Fence:
   1. Where required by the local municipality having jurisdiction, where indicated on the plans, or where required at critical areas, silt fence shall be installed with a backing of steel woven wire fence. Woven wire fabric shall conform to ASTM A116 with a Class 1 zinc coating. Woven wire fabric shall be at least 32 inches wide with a maximum opening size of 6 inches x 6 inches.
   2. Fabric: Polypropylene geotextile conforming to ASTM D4439, resistant to common soil chemicals, mildew, and insects; non-biodegradable; with a minimum roll width of 36 inches.
   3. Manufacturers:
      a. Propex Geosynthetics; GEOTEX 2130: www.geotextile.com
      b. Or Approved Equal.

F. Silt Fence Posts: Minimum 5 feet (1500 mm) long.
   1. Wood posts: Treated, with minimum dimensions of 1-1/2 inches by 1-1/2 inches for square posts, or 2 inch diameter for round posts.
   2. Steel Posts: 1.3 lb/ft minimum with projections for fastening wire or fabric, and a metal plate welded near bottom.

G. Erosion Control Blanket and Turf Reinforcement Mat
   1. Erosion Control Blanket and Turf Reinforcement Mat shall conform to Section 856 of the NDDOT Standard Specifications, current edition.

H. Temporary Erosion Control Blanket
   1. North American Green C125BN or approved equal.

I. Permanent Turf Reinforcement Mat
   1. Propex Geosynthetics Landlok 300.
   2. North American Green VMax C350.
   3. Hanes Geo Components Scourstop Transition Mat.
   4. Or approved equal.

J. Storm Drain Inlet Sediment Traps: Means of preventing sediment infiltration at storm sewer inlets shall be at Contractors option, and shall be selected from the preferred alternatives listed below, or an approved equal:
   1. Inlet filter bag: Flexstorm or approved equal.
   2. Weighted fiber rolls.
   3. Bale checks.

PART 3 EXECUTION

3.1 EXAMINATION

A. Check over entire project site and note all potentially sensitive areas before any work begins.

B. After work begins, check protected areas daily.

C. After each rainfall check over all disturbed areas within the site and make appropriate adjustments and corrections.

D. After construction has been completed and until vegetation takes root inspect site on a regular basis, especially in the spring and after rainfall.

3.2 INSTALLATION

A. Install erosion control fencing in all erodible areas according to manufacturers' instructions.

3.3 FIELD QUALITY CONTROL

A. Instruct all workers on the importance of erosion control and proper procedures to follow when erosion problems are encountered.

3.4 CLEANOUT AND PROJECT CLOSEOUT

A. Remove all erosion control barriers from site when vegetation has rooted.

B. Properly dispose of all material used for erosion control when removed.

3.5 EROSION CONTROL REQUIREMENTS

A. The Contractor shall submit an erosion control plan to meet the requirements of the Storm Water Pollution Program. All measures shall be taken to control erosion as per both City and North Dakota State Health Department policy.

B. If materials are required to control erosion such as silt fencing, straw bales, as per other devices, these items will be paid for separately as per the price bid on the bid form. Any and all devices used for erosion control shall be approved by the Engineer.

C. The Contractor has day to day operational control of construction and activities and is thus an operator of the project under the Storm Water Permit. The operator is required by the permit to adhere to the conditions of the Storm Water Permit and Storm Water Pollution Prevention Plan as it related to controlling erosion and sedimentation during construction activities, maintaining erosion control devices, conducting inspections and maintaining appropriate records. The Contractor shall be required to complete and sign a permit application as it pertains to an operator.

D. When the Contractor's project is finalized, the contractor may be released from the Storm Water Permit. If, at the time of finalization, the project meets the criteria for final stabilization, the Contractor may file a Notice of Termination (NOT) to the North Dakota Department of Health (NDDOH).

3.6 POLLUTION PREVENTION PROGRAM

A. The Contractor must develop site specific plans or a system to evaluate and implement appropriate BMPs for construction activities less than 1 acre that must include:
   1. Description of the activity, proposed timetable, amount of area disturbed, and any outfalls to the storm sewer or a water body;
   2. Map or drawing of the site showing the site boundaries, soil disturbance limits, storm water drainage pattern, location of receiving waters and/or storm inlets, storage areas for materials, and storm water controls;
   3. A description of the activity, proposed timetable, amount of area disturbed, and any outfalls to the storm water;
   4. A description of the BMPs to control erosion and sediment during various phases of construction;
   5. A description of methods to address sediment tracking on roads, recovering sediments, spill prevention and response procedures;
   6. Site inspection procedure providing for at least one inspection weekly and within 24 hours after any storm event of greater than 0.25 inches of rain per 24 hour period unless prevented due to adverse conditions such as flooding, snow cover, high winds, electrical storms, etc.;
   7. A Site Inspection Record (SIR) shall be kept that contains the date and time of inspections, the name of the person performing the inspection, the date and amount of last precipitation event. All incidents of erosion, sediment accumulation, or spills shall be documented and noted on the SIR. The record shall include the location and description of the incident, estimated quantity of material or size of area affected, and a brief explanation of potential cause and remedial action taken. Copies of the Site Inspection Record (SIR) shall be provided to the Engineer and the City of Dickinson's MS-4 Coordinator.

PART 4 MEASUREMENT AND PAYMENT

4.1 MEASUREMENT

A. Measurement is not required unless a defined unit of measurement is provided on the bid form.

B. Basis of measurement, if required, will be by the square foot (SF) or the square yard (SY) or lineal feet (LF).

4.2 PAYMENT

A. Payment for all required erosion control will be incidental to other items of general construction unless a bid item is provided.

B. If a bid item is provided payment will be based upon the quantity measured in the field, approved and accepted by the Engineer.

END OF SECTION

SECTION 01 5700

TRAFFIC REGULATION FOR MUNICIPAL CONSTRUCTION

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Construction Traffic Control

1.2 REFERENCES

A. Manual of Uniform Traffic Control Devices, (MUTCD), latest edition.

B. Section 704 of the North Dakota Department of Transportation (NDDOT) Standard and Supplemental Specifications for Road and Bridge Construction, latest edition.

1.3 SUBMITTALS

A. Submit a Traffic Control Plan for City review and approval at the Pre-Construction Conference. If no Pre-Construction Conference is held, Traffic Control Plan shall be submitted prior to site mobilization.

1.4 QUALIFICATIONS

A. Provide a qualified traffic maintenance person with the following minimum qualifications:
   1. Have previous experience working with maintenance and protection of traffic.
   2. Be competent to supervise personnel in traffic maintenance operations.

PART 2 PRODUCTS

2.1 MATERIALS

A. Use only traffic control devices manufactured from materials that are durable, lightweight, rigid and visible, but do not create a hazard when struck.

2.2 ACCESSORIES

A. Barricades: Type III, clear, well maintained and properly marked or lighted for nighttime use.

B. Signs: Utilize signs with messages appropriate to provide adequate construction control. Signs and sign mountings shall conform to Section 704 of the NDDOT Standard Specifications for Road and Bridge Construction, current edition.

C. Cones: A minimum of 28 inches high with 6-inch wide reflectorized white bands, placed 3-4 inches from the top for nighttime use.

D. Lights, delineators and reflectors: Red, yellow or white in color with no less than 12 square inches of reflective area per unit.

E. Delineator Drums: Drums shall be approximately 36 inches in height and minimum of 18 inches in diameter at the top. They shall be constructed of durable plastic with horizontal, circumferential, orange and white reflectorized stripes. The reflectorized stripes shall be fabricated from Type III C, Type IV, or Wide Angle Prismatic flexible reflective sheeting. Delineator drums shall be weighted with sand placed at the bottom of the drum or constructed so that they cannot be blown over or displaced by wind or passing traffic, and do not create a hazard if accidentally struck.

F. Traffic Cones: The cones shall be orange in color, shall be a minimum of 28 inches in height with a broadened base, and fabricated from materials that withstand impact. For nighttime use, cones shall have a minimum 6- inch wide white flexible reflectorized band placed a minimum of 3 inches, but not more than 4 inches, from the top. An additional 4-inch white reflectorized band shall be placed a minimum of 2 inches below the 6 inch band. The cones shall be weighted at the base to prevent overturning by the wind. The reflectorized bands shall be fabricated from Type III C, Type IV or Wide Angle Prismatic flexible reflective sheeting.

PART 3 EXECUTION

3.1 EXAMINATION

A. Visually evaluate traffic conditions to determine which approach has the least impact.

3.2 PREPARATION

A. Provide, erect and place all required traffic control devices in the appropriate locations prior to beginning any construction activity.

3.3 SCHEDULING AND COORDINATION

A. Prior to commencing work, develop and agree to a detailed schedule between the City, Engineer, Utility Companies, the Contractor and Subcontractor(s).

B. Schedule work to reopen a closed intersection in the most expedient manner. Any public road closures shall be approved by the City.

C. Provide access to all residential dwellings and businesses adjacent to this project.

D. All TTC devices shall be removed as soon as practical when they are no longer needed. When work is suspended for short periods of time, TTC devices that are no longer appropriate shall be removed or covered.

3.4 ACCESS ROADS

A. Contractor shall utilize only those roads designated as access roads by the City for access to the project site.

B. Tracked vehicles not allowed on paved areas.

C. Contractor shall install vehicle tracking pads to prevent material tracking onto adjacent roadways.

D. Extend and relocate as Work progress requires, provide detours as necessary for unimpeded traffic flow.

E. Provide unimpeded access for emergency vehicles. Maintain 20 foot (6 m) width driveways with turning space between and around combustible materials.

F. Provide and maintain access to fire hydrants free of obstructions.

3.5 HAUL ROUTES

A. Confine construction traffic to designated haul routes.

B. Provide traffic control at critical areas of haul routes to regulate traffic, to minimize interference with public traffic.

3.6 MAINTENANCE

A. Maintain traffic and parking areas in a sound condition free of excavated material, construction equipment, Products, mud, snow, and ice.

B. Maintain existing paved areas used for construction; promptly repair breaks, potholes, low areas, standing water and other deficiencies resulting from construction activities or Contractor's use to pre-construction conditions.

3.7 PROTECTION OF FINISHED WORK

A. Traffic regulation includes protecting finished work from traffic until the finished work has cured, cooled or stabilized enough to handle traffic.

3.8 PROJECT RECORD DOCUMENTS

A. Provide documentation of each day's inspection results and remedial activities at the end of each working day.

PART 4 MEASUREMENT AND PAYMENT

4.1 MEASUREMENT

A. Items as required within the plans and traffic control details.

B. If traffic control is bid by the unit, EACH, on the bid form, EACH unit is defined as listed in “A” above within the plans and traffic control details.

C. If traffic control is bid as a Lump Sum on the bid form, the amount bid must include the appropriate number of units as defined in “A” above within the plans and traffic control details to properly complete the project.

4.2 PAYMENT

A. Include all costs associated with the requirements listed herein in the lump sum price bid for traffic control.

B. Payment for EACH will be made according to the actual units approved by the Engineer in the field.

C. If no bid item is provided payment will be incidental to other related items of work.

END OF SECTION

SECTION 01 6001

MATERIAL AND EQUIPMENT

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Products.

B. Transportation and handling.

C. Storage and protection.

D. Product options.

E. Substitutions.

1.2 RELATED SECTIONS

A. Instructions to Bidders: Product options and substitution procedures

B. Section 01 0130 - Submittals: Submittal procedures.

C. Section 01 4001 - Quality Control: Product quality monitoring.

1.3 SUBMITTALS

A. See Section 01 0130 - Submittals for submittal requirements and procedures.

B. Product Data Submittals: Submit manufacturer's standard published data. Mark each copy to identify applicable products, models, options, and other data. Supplement manufacturers' standard data to provide information specific to this Project.

C. Shop Drawing Submittals: Prepared specifically for this Project; indicate utility and electrical characteristics, utility connection requirements, and location of utility outlets for service for functional equipment and appliances.

D. Sample Submittals: Illustrate functional and aesthetic characteristics of the product, with integral parts and attachment devices. Coordinate sample submittals for interfacing work.
   1. For selection from standard finishes, submit samples of the full range of the manufacturer's standard colors, textures, and patterns.

PART 2 PRODUCTS

2.1 PRODUCTS

A. Provide new products unless specifically required or permitted by the Contract Documents.

B. Do not use materials and equipment removed from existing premises, except as specifically permitted by the Contract Documents.

C. Existing materials and equipment indicated to be removed, but not to be re-used, relocated, reinstalled, delivered to the City, or otherwise indicated as to remain the property of the City, become the property of the Contractor; remove from site.

PART 3 EXECUTION

3.1 TRANSPORTATION AND HANDLING

A. Transport and handle Products in accordance with manufacturer's instructions.

B. Promptly inspect shipments to ensure that Products comply with requirements, quantities are correct, and Products are undamaged.

C. Provide equipment and personnel to handle Products by methods to prevent soiling, disfigurement, or damage.

3.2 STORAGE AND PROTECTION

A. Store and protect Products in accordance with manufacturer's instructions, with seals and labels intact and legible.

B. Store sensitive Products in weather tight, climate controlled enclosures.

C. For exterior storage of fabricated Products, place on sloped supports, above ground.

D. Provide off-site storage and protection when site does not permit on-site storage or protection.

E. Cover Products subject to deterioration with impervious sheet covering. Provide ventilation to avoid condensation or potential degradation of Product.

F. Store loose granular materials on solid flat surfaces in a well-drained area. Prevent mixing with foreign matter.

G. Provide equipment and personnel to store Products by methods to prevent soiling, disfigurement, or damage.

H. Arrange storage of Products to permit access for inspection. Periodically inspect to verify products are undamaged and are maintained in acceptable condition.

3.3 PRODUCT OPTIONS

A. Products Specified by Reference Standards or by Description Only: Any Product meeting those standards or description.

B. Products Specified by Naming One or More Manufacturers with a Provision for Substitutions: Submit a request for substitution for any manufacturer not named in accordance with the following article.

3.4 SUBSTITUTIONS

A. Instructions to Bidders specifies time restrictions for submitting requests for Substitutions during the bidding period and the documents required. Any products approved during the bidding period will be identified by Addendum.

B. Substitutions may be considered when a Product becomes unavailable through no fault of the Contractor.

C. Document each request with complete data substantiating compliance of proposed Substitution with Contract Documents.

D. A request constitutes a representation that the Contractor:
   1. Has investigated proposed Product and determined that it meets or exceeds the quality level of the specified Product.
   2. Will provide the same warranty for the Substitution as for the specified Product.
   3. Will coordinate installation and make changes to other Work which may be required for the work to be complete with no additional cost to City.
   4. Waives claims for additional costs or time extension which may subsequently become apparent.

E. Substitutions will not be considered when they are indicated or implied on shop drawing or product data submittals, without separate written request, or when acceptance will require revision to the Contract Documents.

F. Substitution Submittal Procedure:
   1. Submit three copies of request for Substitution for consideration. Limit each request to one proposed Substitution.
   2. Submit shop drawings, product data, and certified test results attesting to the proposed product equivalence. Burden of proof is on proposer.
   3. The City will notify Contractor in an addendum of decision to accept or reject request.

PART 4 MEASUREMENT AND PAYMENT

4.1 MEASUREMENT AND PAYMENT

A. All work described herein is incidental to other related items of work. No measurement or additional payment will be considered.

END OF SECTION

SECTION 01 7001

CONTRACT CLOSEOUT

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Closeout procedures, final cleaning, adjusting, project record documents, warranties, spare parts, and maintenance materials.

1.2 REFERENCE

A. Contract Documents

1.3 OPERATIONS AND MAINTENANCE DATA

A. Every individual component supplied for the project shall be identified in the operations and maintenance manual which shall be assembled as follows:
   1. Each O&M manual shall be divided into a minimum of two volumes.
   2. Volume One shall contain at least the following:
      a. Final tag list.
      b. Detailed floor plan showing location of each tagged piece of equipment.
      c. An overview of the plant, the process equipment, and the control system and how the plant's systems and subsystems interact and are controlled.
      d. Complete description prepared by the Process Equipment Supplier of each system and subsystem and component with cross reference to tag number.
      e. Complete operating and maintenance instructions for each and every item of equipment (referencing tag number), setting forth in detail and step-by-step the procedure for starting, stopping, operating and maintaining the entire system as installed. A schedule of recommended maintenance intervals shall also be included.
      f. Any special emergency operating instructions and a list of service organizations, including addresses and telephone numbers, capable of rendering emergency service to the various parts of the system.
      g. Procedures for normal operation, trouble shooting, routine data analysis, water analysis, interpretation of data, etc.
      h. h. A section on plant safety in general and for each system.
      i. Appendices to Volume One shall include the following:
         1) P & I.D.'s and mechanical, electrical and instrumentation installation drawings on 11" x 17" size paper.
         2) Copy of final control system ladder logic.
         3) A complete valve tag list, including the name and function of the pipe in which the valve is mounted.
         4) All manufacturer's equipment guarantees and warranties.
   3. Volume Two shall contain, at lease, the following:
      a. Manufacturer's manuals for each piece of equipment including individual components and subsystems of complete assemblies. The section of the manual on operation shall describe the function of each component and its relationship to the system of which it is a part. Where several models, options or styles are described, the manual shall identify the items actually provided.
      b. Blue line prints or reviewed shop drawings or reviewed shop drawing and diagrams of all systems.
      c. Certified equipment drawings or reviewed shop drawing data clearly marked for equipment furnished.
      d. Complete parts list of all replaceable parts, their part numbers and the name and address of the nearest vendor.

4. Binding
    a. Manuals shall be bound in durable plastic or fiberboard covers. Each sheet shall be reinforced to prevent tearing from continued use and each manual shall have the following information clearly printed on it's inside cover:
        1) Project name and address (inside and outside cover).
        2) Name and address of Engineers.
        3) Name and addresses of Contractor and Subcontractors.
        4) Telephone numbers of Contractors, including night and emergency numbers.
        5) Major equipment vendor's names and telephone numbers.
5. Number of complete sets shall be 3, as outlined herein.

1.4 QUALITY ASSURANCE

A. All equipment must be properly labeled as directed by the Manufacturer or in the technical specifications.

1.5 WARRANTY

A. Provide duplicate notarized copies.

B. Execute and assemble transferable warranty documents from Subcontractors, Suppliers, and Manufacturers.

C. Provide Table of Contents and assemble in binder with durable cover.

D. Submit prior to final Application for Final Payment.

PART 2 NOT APPLICABLE

PART 3 EXECUTION

3.1 PREPARATION

A. Execute final facility cleaning prior to final project assessment.

B. Clean interior and exterior glass, surfaces exposed to view; remove temporary labels, stains and foreign substances, polish transparent and glossy surfaces.

C. Clean equipment and fixtures to a sanitary condition with cleaning materials appropriate for the surface and material being cleaned.

D. Clean operating equipment components and accessories such as filters.

E. Clean debris from drainage systems.

F. Clean site, sweep paved areas, rake clean landscaped surfaces.

G. Remove waste and surplus materials, rubbish, and construction facilities from the site.

H. Adjust operating products and equipment to ensure smooth and unhindered operation.

3.2 SCHEDULING AND COORDINATION

A. Coordinate with City on how project is taken over and operated during transition.

3.3 TOLERANCES

A. Verify that all specified tolerances are being met.

3.4 PROTECTION OF FINISHED WORK

A. Protect all finished work until City accepts responsibility.

3.5 PROJECT RECORD DOCUMENTS

A. Provide to Engineer one set of the following record documents; record actual revisions to the Work:
   1. Drawings.
   2. Specifications.
   3. Addenda.
   4. Change Orders and other modifications to the Contract.
   5. Reviewed Shop Drawings, Product Data, and Samples.
   6. Manufacturer's instructions for assembly, installation, and adjusting.

B. Ensure entries are complete and accurate, enabling future reference by City.

C. Store record documents separate from documents used for construction.

D. Record information concurrent with construction progress.

E. Specifications: Legibly mark and record at each product section description of actual products installed, including the following:
   1. Manufacturer's name and product model and number.
   2. Product substitutions or alternates utilized.
   3. Changes made by Addenda and modifications.

F. Record Documents and Shop Drawings: Legibly mark each item to record actual construction including:
   1. Measured depths of foundations in relation to finished first floor datum.
   2. Measured horizontal and vertical locations of underground utilities and appurtenances, referenced to permanent surface improvements.
   3. Measured locations of internal utilities and appurtenances concealed in construction, referenced to visible and accessible features of the Work.
   4. Field changes of dimension and detail.
   5. Details not on original Contract Drawings.

G. Submit Operations and Maintenance Manual bound in 8½ x 11 inch text pages, capacity expansion binders with durable covers.
   1. Prepare binder cover with printed title "OPERATION AND MAINTENANCE INSTRUCTIONS", title of project and subject matter of binder when multiple binders are required.
   2. Internally subdivide the binder contents with permanent page dividers, logically organized as described below; with tab titling clearly printed under reinforced laminated plastic tabs.
   3. Prepare a Table of Contents for each volume, with each product or system description identified.
   4. Submit 1 draft copy of completed volumes 15 days prior to final inspection. This copy will be reviewed and returned, with Engineer comments. Revise content of all document sets as required by Engineer prior to final submission.
   5. Submit 3 sets of revised final volumes, within 10 days after final inspection.

H. Submit written certification that Contract Documents have been reviewed, Work has been inspected, and that Work is complete in accordance with Contract Documents and ready for Engineer's review.

3.6 SPARE PARTS AND MAINTENANCE MATERIALS

A. Provide products, spare parts, maintenance and extra materials in quantities specified in individual technical specification sections.

B. Deliver to location as directed by Engineer.

PART 4 MEASUREMENT AND PAYMENT

4.1 MEASUREMENT

A. Measurement for this item of work will not be required.

4.2 PAYMENT

A. Payment will be incidental to related equipment and other items of work.

END OF SECTION

SECTION 02 3010

SUB-SURFACE CONDITIONS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Soil Investigation

1.2 REFERENCES

A. Contract Documents

1.3 SOIL INVESTIGATION

A. If a Geotechnical Evaluation was obtained by the City, such report will be made available and may be obtained by contacting the City. . If obtained, the report is only for the City's use and is not a part of the Contract Documents. The report and log of borings is available for the Contractor's information, but is not a warrant of subsurface conditions. The Contractor should visit the site and acquaint himself with all existing conditions. Prior to bidding, bidders may make their own subsurface investigations to satisfy themselves as to site and subsurface conditions, but such subsurface investigation shall be performed only under time schedules and arrangements approved in advance by the City.

B. The Geotechnical Engineer may be retained by the City to observe performance of work with excavation, filling and grading. Re-adjust all work that does not meet technical or design requirements, but make no deviations from the Contract Documents without specific and written approval of the City and Project Engineer.

PART 2 PRODUCTS

NOT USED

PART 3 EXECUTION

NOT USED

END OF SECTION

SECTION 02 4205

DEMOLITION

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Demolition of designated structures, facilities and appurtenances and removal of materials from site.

1.2 SUBMITTALS

A. Demolition Plan: Indicate demolition and removal sequence, location and construction of barricades and fences, and areas for temporary construction and field offices.

B. Project Record Documents: Accurately record actual locations of capped and active utilities and subsurface construction.

1.3 REGULATORY REQUIREMENTS

A. Conform to Federal, State and Local laws and regulations for demolition of structures, safety of adjacent structures, dust control and material disposal.

B. Conform to applicable regulatory procedures when discovering hazardous or contaminated materials.

C. State regulatory agency is the North Dakota State Department of Health, Environmental Services Section.

D. Coordinate with building official on local permitting.

PART 2 PRODUCTS

2.1 FILL MATERIALS

A. Obtain locally if available.

B. Use select fill material backfill, if available. Obtain City approval prior to use.

PART 3 EXECUTION

3.1 PREPARATION

A. Obtain disposal permit from local governing entity.

B. Notify all utility companies and comply with requirements.

C. Notify North Dakota State Department of Health for underground storage tank removal (if required), solid waste disposal and storm water discharge permits.

D. Notify City and Engineer 7 working days prior to beginning demolition work.

E. Provide, erect and maintain temporary barriers and security devices. Temporary barriers remain in place until the site is backfilled and cleared.

F. Protect existing signs, paved streets, streetlights, street signs, trees, landscaping, utility poles and appurtenances that are not to be demolished.

G. Mark location of utilities. Verify with the utility companies that all utilities have been removed and capped within the demolition area.

H. Check for presence of asbestos and make appropriate arrangements for removal and disposal. Follow ND State Department of Health for inspection, removal and disposal.

I. Erect silt fence and other erosion control barriers.

J. Verify City has removed all items to be salvaged and verify which items are to be demolished.

K. City will remove all materials to be retained prior to beginning demolition.

3.2 DEMOLITION REQUIREMENTS

A. Explosives are not allowed.

B. Conduct demolition to minimize interference with adjacent appurtenances that are to remain.

C. Cease operations immediately if adjacent appurtenances appear to be in danger. Notify Engineer. Do not resume operations until directed.

D. Conduct operations with minimum interference to private accesses. Protect those accesses from the demolition operation.

E. Obtain written permission from adjacent property owners when demolition equipment will traverse, infringe upon, or limit access to their property.

F. Sprinkle work with water as required to minimize dust. Provide hoses and water connections and distribution vehicle for this purpose.

G. Existing sewer and water utilities (if present) within the demolition site will be located by the City. Once located, expose and plug these lines in the presence of the City representative. Provide record location on construction plans.

H. Remove all underground walls and footings.

I. Remove concrete slabs on grade at street level within the designated demolition area.

J. Backfill open pits and holes caused as a result of demolition.

K. Thoroughly compact all graded areas affected by demolition to maintain positive drainage.

L. Dispose of all demolition materials appropriately and in a manner that complies with all laws and regulations.

M. Do not burn or bury materials on site.

N. Backfill all excavated areas immediately with approved select backfill material.

3.3 FIELD QUALITY CONTROL

A. Contact Engineer and regulatory agencies whenever questions arise or unexpected situations occur.

3.4 PROTECTION OF SITE

A. Protect site from erosion.

B. Protect survey monuments, benchmarks, existing utilities and other existing items that are to remain.

3.5 CLEAN-UP AND PROJECT CLOSEOUT

A. Prior to demolition Contractor leaving site, contact Engineer and complete a walkover inspection with City and Engineer.

B. Clear all items removed from site.

C. Grade site for positive drainage.

D. Leave site in clean condition.

3.6 PROJECT RELATED DOCUMENTS

A. Existing improvements to remain within 10 feet of the area being demolished shall be replaced by the Contractor if damage resulting from contact during construction occurs within 1-year after final acceptance by City. Warranty shall include all costs for materials and installation.

3.7 PROJECT RELATED DOCUMENTS

A. Furnish a demolition plan to Engineer that shows ties to existing utilities that were encountered during demolition operations.

PART 4 MEASUREMENT AND PAYMENT

4.1 MEASUREMENT

A. If specific items are listed on bid form, Engineer will make measurement in accordance with each specific bid item. For lump sum (LS) bid items measurements will not be made.

4.2 PAYMENT

A. Payment for specific bid items will be made according to the units bid and accepted by Engineer.

B. Payment for demolition not identified on the bid form will be incidental to related construction work.

END OF SECTION

SECTION 31 1211

SITE CLEARING

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Removal of all surface debris.

B. Clear site of plant life, trees, shrubs, and grass.

C. Removal of all root systems.

1.2 SUBMITTALS

A. If special safety protection, signing, or erosion control is required or if traffic control is required, submit written details to City and Engineer in advance of beginning work.

1.3 QUALITY ASSURANCE

A. Employ an approved, competent forester to advise and assist in determining how trees and shrubs can be cut and removed with minimal damage to adjacent plant life.

1.4 REGULATORY REQUIREMENTS

A. North Dakota State Department of Health:
   1. Solid Waste Division for disposal of debris.
   2. Water Quality Division for storm water runoff and erosion control.
   3. Environmental Section for clean air standards.

1.5 ENVIRONMENTAL REQUIREMENTS

A. Report any indication of soil, water or air contamination to Engineer immediately.

B. Minimize dust, noise and erosion control by all available means.

C. Develop an approved erosion control plan.

D. Enforce erosion and pollution control plans and program.

1.6 WARRANTY

A. Existing plant life and concrete or asphalt within 10 feet of the area being cleared, shall be replaced by Contractor if death or damage resulting from contact during construction occurs within 1 year after final acceptance by City. Warranty shall include all costs for materials and installation.

PART 2 PRODUCTS

2.1 REPLACEMENT OF DAMAGED PLANTS OR SHRUBS

A. In the event plants or shrubs adjacent to the site become damaged or die within the warranty period, acquire replacement items of the same type and species from a City-approved, reputable retailer. Warranty shall include all costs for materials and installation.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify that site to be cleared is clearly marked and staked.

B. Locate and document on the field plans, the location of all buried utilities.

C. Verify that all plant life and adjacent structures that are to remain undamaged are tagged or marked.

D. Verify all warning lights, barriers, signs and other public safety items are in good operating and well-maintained condition.

3.2 CLEARING

A. Clear all areas within designated limits of site.

B. Remove all debris from site and properly dispose.

C. Apply an approved soil sterilant where existing vegetation is replaced by gravel, concrete or asphalt.

3.3 TOLERANCES

A. Remove stumps and root system to a depth of 12 inches below the newly proposed grade.

B. Remove concrete and permanent structures to a depth of 48 inches below the newly proposed grade.

3.4 FIELD QUALITY CONTROL

A. Contact Engineer whenever questions or unexpected situations arise.

3.5 PROTECTION

A. Protect adjacent plant life and construction features which are to remain.

B. Protect all survey monuments and benchmarks.

C. Protect all adjacent, buried or above ground utilities.

3.6 CLEANUP AND PROJECT CLOSEOUT

A. Prior to beginning new construction and prior to acceptance by City, a walk over inspection shall be completed by Contractor, Engineer and City.

B. Properly dispose of all debris removed.

3.7 PROJECT RECORD DOCUMENTS

A. Furnish a field plan to Engineer, showing all existing utilities encountered during clearing operation.

PART 4 MEASUREMENT AND PAYMENT

4.1 MEASUREMENT

A. Measurement will only be required if bid form has defined items for site clearing.

4.2 PAYMENT

A. Payment will be incidental to other items of related construction unless a specific bid item is shown on the bid form for site clearing.

END OF SECTION

SECTION 31 2200

GRADING

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Removal of topsoil.

B. Rough Grading.

C. Replacement of topsoil and finish grading.

1.2 RELATED REQUIREMENTS

A. Section 01 5227 – Slope Protection and Erosion Control: Soil stockpile protection.

B. Section 31 1211 - Site Clearing.

C. Section 31 2316 - Excavation.

D. Section 31 2316.13 - Trenching: Trenching and backfilling for utilities.

E. Section 31 2323 - Fill: Filling and compaction.

F. Section 32 9360 - Seeding: Finish ground cover.

G. Section 32 9100 - Plants: Topsoil in beds and pits.

PART 2 PRODUCTS

2.1 MATERIALS

A. Topsoil: Topsoil excavated on-site and designated for re-use.
   1. Graded.
   2. Free of roots, rocks larger than 1/2 inch (12 mm), subsoil, debris, large weeds and foreign matter.

B. Other Fill Materials: See Section 31 2323.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify that survey bench mark and intended elevations for the Work are as indicated.

3.2 PREPARATION

A. Identify required lines, levels, contours, and datum.

B. Stake and flag locations of known utilities.

C. Locate, identify, and protect from damage above- and below-grade utilities to remain.

D. Notify utility company to remove and relocate utilities.

E. Protect site features to remain, including but not limited to bench marks, survey control points, existing structures, fences, sidewalks, paving, and curbs, from damage by grading equipment and vehicular traffic.

F. Protect trees to remain by providing substantial fencing around entire tree at the outer tips of its branches; no grading is to be performed inside this line.

G. Protect plants, lawns, rock outcroppings, and other features to remain as a portion of final landscaping.

H. Remove all existing asphalt, concrete, and other demolition items from the construction area and properly dispose at an approved disposal area. Aggregate surfacing removed shall be stockpiled for later reuse.

3.3 ROUGH GRADING

A. Remove topsoil from areas to be further excavated, re-landscaped, or re-graded, without mixing with foreign materials.

B. Do not remove topsoil when wet.

C. Remove subsoil from areas to be further excavated, re-landscaped, or re-graded.

D. Perform rough grading to obtain elevations shown on plans or as directed by the Engineer.

E. Areas shall be graded to provide positive drainage.

F. Do not remove wet subsoil, unless it is subsequently processed to obtain optimum moisture content.

G. When excavating through roots, perform work by hand and cut roots with sharp axe.

H. See Section 31 2323 for filling procedures.

I. Stability: Replace damaged or displaced subsoil to same requirements as for specified fill.

J. The subgrade shall be maintained until permanent improvements are installed. Any damage due to inclement weather, contractor operations, or any other contractor/utility operations shall be repaired by the contractor at no expense to the contract.

3.4 SOIL REMOVAL

A. Stockpile topsoil to be re-used on site; remove remainder from site.

B. Stockpile subsoil to be re-used on site; remove remainder from site.

3.5 FINISH GRADING

A. Before Finish Grading:
   1. Verify building and trench backfilling have been inspected.
   2. Verify subgrade has been contoured and compacted.

B. Remove debris, roots, branches, stones, in excess of 1/2 inch in size. Remove soil contaminated with petroleum products.

C. Where topsoil is to be placed, scarify surface to depth of 3 inches.

D. In areas where vehicles or equipment have compacted soil, scarify surface to depth of 3 inches.

E. Place topsoil in areas indicated to depth indicated on plans. Minimum topsoil replacement depth is 4 inches in turf areas and 12 inches in planting beds.

F. Place topsoil where required to level finish grade.

G. Place topsoil during dry weather.

H. Remove roots, weeds, rocks, and foreign material while spreading.

I. Near plants spread topsoil manually to prevent damage.

J. Fine grade topsoil to eliminate uneven areas and low spots. Maintain profiles and contour of subgrade.

K. Lightly compact placed topsoil.

3.6 TOLERANCES

A. Top Surface of Subgrade: Plus or minus 0.08 foot (1 inch) from required elevations.

B. Top Surface of Finish Grade: Plus or minus 0.04 foot (1/2 inch) from required elevations.

3.7 REPAIR AND RESTORATION

A. Existing Facilities, Utilities, and Site Features to Remain: If damaged due to this work, repair or replace to original condition.

B. Trees to Remain: If damaged due to this work, trim broken branches and repair bark wounds; if root damage has occurred, obtain instructions from City and Engineer as to remedy.

C. Other Existing Vegetation to Remain: If damaged due to this work, replace with vegetation of equivalent species and size.

3.8 FIELD QUALITY CONTROL

A. See Section 31 2323 for compaction density testing.

3.9 PROJECT RECORD DOCUMENTS

A. Provide Engineer with a set of "as constructed" plans for entire project showing locations of all underground utilities and appurtenances (both existing and newly installed).

B. Identify different soil conditions encountered and note any newly discovered buried utilities.

3.10 CLEANING

A. Remove unused stockpiled topsoil and subsoil. Grade stockpile area to prevent standing water.

B. Leave site clean and raked, ready to receive permanent improvements.

PART 4 MEASUREMENT AND PAYMENT

4.1 MEASUREMENT

A. If specific items are listed on bid form, Engineer will make measurement in accordance with each specific bid item. For lump sum (LS) bid items, measurements will not be made.

4.2 PAYMENT

A. Payment for specific bid items shall be at the unit price bid and shall include all costs for labor, equipment and materials.

END OF SECTION

SECTION 31 2316

EXCAVATION

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Excavating for slabs-on-grade, paving, and site structures.

1.2 RELATED REQUIREMENTS

A. Section 01 5227 - Slope Protection and Erosion Control.

B. Section 31 2200 - Grading: Soil removal from surface of site.

C. Section 31 2200 - Grading: Grading.

D. Section 31 2316.13 - Trenching: Excavating for utility trenches outside the building to utility main connections.

E. Section 31 2323 - Fill: Fill materials, filling, and compacting.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify that survey bench mark and intended elevations for the work are as indicated.

3.2 PREPARATION

A. Identify required lines, levels, contours, and datum.

B. Stake and flag locations of known utilities.

C. Locate, identify, and protect from damage above- and below-grade utilities to remain.

D. Notify utility company to remove and relocate utilities.

E. Protect site features to remain including, but not limited to, bench marks, survey control points, existing structures, fences, sidewalks, paving, and curbs from excavating equipment and vehicular traffic.

F. Protect plants, lawns, and other features to remain.

G. Maintain and keep in good working order, all warning lights, barriers, signs and other traffic control devices as required for the safety of the public and maintenance of traffic.

3.3 EXCAVATING

A. Underpin adjacent structures that could be damaged by excavating work.

B. Excavate to accommodate new structures and construction operations.

C. Notify Engineer of unexpected subsurface conditions and discontinue affected Work in area until notified to resume work.

D. Where wet or unsuitable subsurface conditions are encountered, subcut gravel as defined in Section 31 2323 may be utilized as directed by the Engineer.

E. Cut excavations sufficiently wide to enable safe installation and allow for safe construction. Notify Engineer if plan details cannot be met or maintained. All excavation shall conform to current OSHA requirements and standards.

F. Do not interfere with 45 degree bearing splay of foundations.

G. Correct areas that are over-excavated and load-bearing surfaces that are disturbed; see Section 31 2323.

H. Grade top perimeter of excavation to prevent surface water from draining into excavation.

I. Remove excavated material that is unsuitable for re-use from site.

J. Stockpile excavated material to be re-used in area designated on site in accordance with Section 31 2200.

K. Remove excess excavated material from site.

3.4 FIELD QUALITY CONTROL

A. See Section 01 4001 - Quality Control, for general requirements for field inspection and testing.

B. Provide for visual inspection of load-bearing excavated surfaces before placement of foundations.

3.5 PROTECTION

A. Prevent displacement of banks and keep loose soil from falling into excavation; maintain soil stability.

B. Protect bottom of excavations and soil adjacent to and beneath foundation from freezing.

PART 4 MEASUREMENT AND PAYMENT

4.1 4.1 MEASUREMENT

A. If specific items are listed on bid form, Engineer will make measurement in accordance with each specific bid item. For lump sum (LS) bid items, measurements will not be made.

4.2 PAYMENT

A. Payment for specific bid items shall be at the unit price bid and shall include all costs for labor, equipment and materials.

END OF SECTION

SECTION 31 2316.13

TRENCHING

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Trenching for utilities from 5' outside of buildings to utility main connections.

B. Backfill of utility trenches.

1.2 RELATED REQUIREMENTS

A. Section 31 2200 - Grading: Site grading.

B. Section 31 2316 - Excavation: Building and foundation excavating.

C. Section 31 2323 - Fill: Material classifications for utilities.

1.3 DEFINITIONS

A. Finish Grade and Utility Invert Elevations: Indicated on drawings.

PART 2 PRODUCTS

2.1 FILL MATERIALS

A. See Section 31 2323 for fill materials.

2.2 SOURCE QUALITY CONTROL

A. See Section 01 4001 - Quality Control, for general requirements for testing and analysis of soil material.

B. Where fill materials are specified by reference to a specific standard, testing of samples for compliance will be provided before delivery to site.

C. If tests indicate materials do not meet specified requirements, change material and retest.

D. Provide materials of each type from same source throughout the Work.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify that survey bench marks and intended elevations for the work are as indicated.

3.2 PREPARATION

A. Identify required lines, levels, contours, and datum.

B. Stake and flag locations of known utilities.

C. Locate, identify, and protect from damage above- and below-grade utilities to remain

D. Notify utility company to remove and relocate utilities.

E. Protect site features to remain including, but not limited to, bench marks, survey control points, existing structures, fences, sidewalks, paving, and curbs from excavating equipment and vehicular traffic.

F. Protect plants, lawns, and other features to remain.

G. Maintain and keep in good working order, all warning lights, barriers, signs and other traffic control devices as required for the safety of the public and maintenance of traffic.

3.3 TRENCHING

A. Notify Engineer of unexpected subsurface conditions and discontinue affected Work in area until notified to resume work.

B. Where wet or unsuitable subsurface conditions are encountered, subcut gravel as defined in Section 31 2323 may be utilized as directed by the Engineer.

C. Remove all topsoil from area to be trenched.

D. Do not interfere with 45 degree bearing splay of foundations.

E. Cut trenches sufficiently wide to enable safe installation and allow for safe construction. Notify Engineer if plan details cannot be met or maintained. All excavation and trenching shall conform to current OSHA requirements and standards.

F. Hand trim excavation for bell and spigot pipe joints and other appurtenant items. Remove or compact all loose soil under pipe to form firm bedding.

G. Remove large stones and other hard matter that could damage piping or impede consistent backfilling or compaction.

H. Remove excavated material that is unsuitable for re-use from site.

I. Stockpile excavated material to be re-used in area designated on site in accordance with Section 31 2200.

J. Remove excess excavated material from site.

3.4 PREPARATION FOR UTILITY PLACEMENT

A. Cut out soft areas of subgrade not capable of compaction in place. Backfill with general fill or, when directed by Engineer, subcut gravel.

B. Compact subgrade to density equal to or greater than requirements for subsequent fill material.

C. Until ready to backfill, maintain excavations and prevent loose soil from falling into excavation.

D. Utility installation shall conform to the specific requirements of the pipe manufacturer for the type of pipe used, with respect to pipe bedding, backfill, and fill material.

3.5 BACKFILLING

A. Backfill to contours and elevations indicated using unfrozen materials.

B. Employ a placement method that does not disturb or damage other work.

C. Systematically fill to allow maximum time for natural settlement. Do not fill over porous, wet, frozen or spongy subgrade surfaces.

D. Maintain optimum moisture content of fill materials to attain required compaction density. See Section 31 2323.

E. Flowable Fill – Fill Type 6: Where indicated on plans or where new utility lines (water, storm or sanitary sewer) cross under an existing utility line and prevents obtaining adequate compaction by mechanical means, Flowable Fill shall be placed for the full trench width from the springline of the lower pipe to the springline of the upper pipe, or to greater extents as indicated on the plans

or directed in the field by the City or Engineer, for five (5) feet minimum along the trench in either direction from the crossing.

F. Pipe Bedding - Fill Type 4a: Place and compact materials in equal continuous layers not exceeding 6 inches compacted depth.

G. General Fill - Fill Type 1: Place and compact material in equal continuous layers not exceeding 8 inches compacted depth where heavy, self-propelled compaction equipment will be utilized, or 6 inches compacted depth where hand-guided equipment will be utilized.

H. Slope grade away from buildings a minimum 2 inches in 10 ft, unless noted otherwise. Make gradual grade changes. Blend slope into level areas.

I. Correct areas that are over-excavated.

J. Relative Compaction Density shall be per Section 31 2323.

K. Reshape and re-compact fills subjected to vehicular traffic.

3.6 TOLERANCES

A. Top Surface of General Backfilling: Plus or minus 1 inch from required elevations.

B. Top Surface of Backfilling Under Paved Areas: Plus or minus 1/2 inch from required elevations.

3.7 FIELD QUALITY CONTROL

A. See Section 01 4001 - Quality Control, for general requirements for field inspection and testing.

B. Perform compaction density testing on compacted fill in accordance with ASTM D1556, ASTM D2167, or ASTM D6938.

C. Evaluate results in relation to compaction curve determined by testing uncompacted material in accordance with ASTM D698 ("standard Proctor"). See Section 31 2323 for compaction requirements.

D. If tests indicate work does not meet specified requirements, remove work, replace and retest. Contractor shall be responsible for all costs associated with additional testing required as a result of failed tests and/or substandard work.

E. Frequency of Tests: See Section 31 2323.

3.8 CLEANING

A. Remove unused stockpiled materials, leave area in a clean and neat condition. Grade stockpile area to prevent standing surface water.

B. Leave borrow areas in a clean and neat condition. Grade to prevent standing surface water.

PART 4 MEASUREMENT AND PAYMENT

4.1 MEASUREMENT

A. If specific items are listed on bid form, Engineer will make measurement in accordance with each specific bid item. For lump sum (LS) bid items, measurements will not be made.

4.2 PAYMENT

A. Payment for specific bid items shall be at the unit price bid and shall include all costs for labor, equipment and materials.

END OF SECTION

SECTION 31 2323

FILL

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Filling, backfilling, and compacting for building volume below grade.

B. Backfilling and compacting for utilities outside the building to utility main connections.

C. Filling holes, pits, and excavations generated as a result of removal (demolition) operations.

1.2 RELATED REQUIREMENTS

A. Section 01 5227 – Slope Protection and Erosion Control.

B. Section 31 2200 - Grading: Removal and handling of soil to be re-used.

C. Section 31 2200 - Grading: Site grading.

D. Section 31 2316 - Excavation: Removal and handling of soil to be re-used.

E. Section 31 2316.13 - Trenching: Excavating for utility trenches outside the building to utility main connections.

F. Section 32 1123 - Aggregate Base Courses: Subgrade preparation and base course installation beneath pavements.

G. Section 33 4600 - Subdrainage: Filter aggregate and filter fabric for foundation drainage systems.

1.3 DEFINITIONS

A. Finish Grade Elevations: Indicated on drawings.

B. Subgrade Elevations: Indicated on drawings.

1.4 REFERENCE STANDARDS

A. ASTM C136/C136M - Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates.

B. ASTM D698 - Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft3 (600 kN-m/m3)) (Editorial Change 2, 2015).

C. ASTM D1556/D1556M - Standard Test Method for Density and Unit Weight of Soil in Place by Sand-Cone Method.

D. ASTM D2167 - Standard Test Method for Density and Unit Weight of Soil in Place by the Rubber Balloon Method.

E. ASTM D2487 - Standard Practice for Classification of Soils for Engineering Purposes (Unified Soil Classification System).

F. ASTM D4318 - Standard Test Methods for Liquid Limit, Plastic Limit, and Plasticity Index of Soils (Editorial Change 1, 2014).

G. ASTM D6938 - Standard Test Method for In-Place Density and Water Content of Soil and Soil-Aggregate by Nuclear Methods (Shallow Depth).

H. North Dakota Department of Transportation (NDDOT) - Standard Specifications for Road and Bridge Construction; 2014.

1.5 SUBMITTALS

A. See Section 01 0130 - Submittals, for submittal procedures.

B. Samples: 10 pounds (4.5 kg) sample of each type of fill; submit in air-tight containers to testing laboratory.

C. Materials Sources: Submit name of imported materials source.

D. Fill Composition Test Reports: Results of laboratory tests on proposed and actual materials used, including manufactured fill.

E. Compaction Density Test Reports.

1.6 DELIVERY, STORAGE, AND HANDLING

A. When necessary, store materials on site in advance of need.

B. When fill materials need to be stored on site, locate stockpiles where designated.
   1. Separate differing materials with dividers or stockpile separately to prevent intermixing.
   2. Prevent contamination.
   3. Protect stockpiles from erosion and deterioration of materials.

PART 2 PRODUCTS

2.1 FILL MATERIALS

A. Fill materials shall conform to the requirements herein unless otherwise approved by the Geotechnical Engineer.

B. General Fill - Fill Type 1: Material excavated on site and approved for use as backfill by Engineer.
   1. Sandy, graded and compactible material.
   2. Free of lumps larger than 3 inches (75 mm), rocks larger than 2 inches (50 mm), organics and debris.

C. Structural Fill - Fill Type 2: To be utilized as foundation fill and within 2 horizontal feet of retaining walls:
   1. Non-frost susceptible Sand having less than 40 percent of particles by weight passing the No. 40 sieve and less than 5 percent by weight passing the No. 200 sieve.

D. Granular Fill - Fill Type 3: Conforming to State of North Dakota Department of Transportation standard for Class 5 Aggregate Base.
   1. To be used as aggregate base under pavements per Section 32 1123.

E. Pipe Bedding - Fill Type 4a
   1. Utilize existing excavated, sandy soil that does not contain rocks or hard chunks larger than ½-inch, if available. If material is not available on site, provide sand from an outside source meeting the following gradation:

Square Mesh Sieve Size	Percent Passing By Weight
1/2" sieve	100%
No. 4 sieve	60-85%
No. 200 sieve	0-10%

   2. Pipe bedding shall conform to and be installed per manufacturers requirements.

F. Subcut Gravel - Fill Type 4b

1. Utilize subcut gravel where the bottom of trenches or excavations is wet or otherwise unsuitable and cannot support loads or provide adequate pipe support, as determined by the Engineer. Subcut gravel shall consist of granular material conforming to the following gradation:

Square Mesh Sieve Size	Percent Passing By Weight
2" sieve	100%
No. 4 sieve	0-10%

G. Drainage Fill - Fill Type 5
1. Drainage Fill for retaining walls: Clean, freely draining aggregate. Place drainage fill in, between, and behind units. Do not use pea gravel. Material shall conform to the following gradation, or as specified by retaining wall Design Engineer:
a. Graded in Accordance with ASTM C136, within the following limits:

Square Mesh Sieve Size	Percent Passing By Weight
1" sieve:	100%
3/4" sieve:	75 - 100%
No. 200 sieve:	0 - 5%

b. Compact to lines and grades on drawings, in lifts 6 inches (152 mm) thick, maximum; decrease lift thickness where necessary to achieve required density.
c. Extend drainage fill 12 inches (305 mm) beyond back face of units.

H. Flowable Fill – Fill Type 6
1. To be utilized where indicated on plans, for watermain or other utility line repairs, or where installation of new utility lines occurs under existing lines and prevents obtaining adequate compaction by mechanical means. Flowable fill shall be a self-compacting cementitious slurry composed of mineral aggregates, cement, fly ash, water, and air-entraining or other admixtures. See Section 31 2324 – Flowable Fill.

I. Topsoil: See Section 31 2200.

J. Clay materials excavated on site and not defined above shall be utilized as approved by the Engineer and in conformance with the recommendations provided by the Geotechnical Engineer.

2.2 SOURCE QUALITY CONTROL

A. See Section 01 4001 - Quality Control, for general requirements for testing and analysis of soil material.

B. Where fill materials are specified by reference to a specific standard, test and analyze samples for compliance before delivery to site.

C. If tests indicate materials do not meet specified requirements, change material and retest.

D. Provide materials of each type from same source throughout the Work.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify that survey bench marks and intended elevations for the Work are as indicated.

B. Identify required lines, levels, contours, and datum.

C. See Section 31 2200 for additional requirements.

3.2 PREPARATION

A. Proof roll subgrade to identify soft areas.

B. Cut out soft areas of subgrade not capable of compaction in place. Backfill with general fill or other material as directed by Engineer.

C. Compact subgrade to density equal to or greater than requirements for subsequent fill material.

D. Until ready to fill, maintain excavations and prevent loose soil from falling into excavation.

E. Verify installation of geotextile fabric where indicated on plans.

3.3 FILLING

A. Fill to contours and elevations indicated using unfrozen materials.

B. Employ a placement method that does not disturb or damage other work.

C. Systematically fill to allow maximum time for natural settlement. Do not fill over porous, wet, frozen or spongy subgrade surfaces.

D. Maintain optimum moisture content of fill materials to attain required compaction density within the following ranges, unless otherwise noted or indicated on the plans or in a geotechnical evaluation:
   1. Granular Soils: +/- 3 percent.
   2. Cohesive Soils Below Foundations & Floor Slabs: 0 to +2 percent.
   3. Cohesive Soils Below Exterior Slabs & Pavements: 0 to +4 percent.
   4. Cohesive Soils Below Grassed Areas: 0 to +6 percent.
   5. If a geotechnical evaluation has been prepared for the project, the recommendations of that evaluation shall govern.

E. Pipe Bedding: Place and compact materials in equal continuous layers not exceeding 6 inches compacted depth. Bedding shall extend 6" below and 6" above buried utilities, or per manufacturers requirements.

F. Lift Thickness: Place and compact material in equal continuous layers not exceeding 8 inches compacted depth where heavy, self-propelled compaction equipment will be utilized, or 6 inches compacted depth where hand-guided equipment will be utilized.

G. Slope grade away from building minimum 2 inches in 10 feet unless noted otherwise. Make gradual grade changes. Blend slope into level areas.

H. Relative Compaction Density shall be as follows per ASTM D698-Standard Proctor, unless otherwise noted or indicated on the plans or in a geotechnical evaluation:
   1. Under Foundations & Floor Slabs: 95-100 percent of maximum dry density.
   2. Subgrade Below Exterior Slabs & Pavements: Minimum 95 percent of maximum dry density.
   3. Aggregate Base Below Exterior Slabs & Pavements: Minimum 98 percent of maximum dry density.
   4. Below Grass and Landscape Planting Areas: Minimum 90 percent of maximum dry density.
   5. Below future parking areas: Minimum 95 percent of maximum dry density.
   6. At other locations and where unspecified: Minimum 95 percent of maximum dry density.
   7. If a geotechnical evaluation has been prepared for the project, the recommendations of that evaluation shall govern.

I. I. Reshape and re-compact fills subjected to vehicular traffic, or damaged or displaced due to construction operations.

3.4 TOLERANCES

A. Top Surface of General Filling: Plus or minus 1 inch from required elevations.

B. Top Surface of Filling Under Paved Areas: Plus or minus 1/2 inch from required elevations.

C. Top Surface of Aggregate Base Under Foundations, Floor Slabs and exterior slabs and pavements: Plus or minus 1/4 inch from required elevations.

3.5 FIELD QUALITY CONTROL

A. See Section 01 4001 - Quality Control, for general requirements for field inspection and testing.

B. Perform compaction density testing on compacted fill in accordance with ASTM D1556, ASTM D2167, or ASTM D6938.

C. Evaluate results in relation to compaction curve determined by testing uncompacted material in accordance with ASTM D698 ("standard Proctor").

D. If tests indicate work does not meet specified requirements, remove work, replace and retest. Contractor shall be responsible for all costs associated with additional testing required as a result of failed tests and/or substandard work.

E. Frequency of Tests, unless otherwise noted or indicated on the plans or in a geotechnical evaluation:
   1. Below Foundations & Floor Slabs: Provide one passing density and moisture test per lift of fill per 2,500 square feet of area.
   2. Below Exterior Slabs & Pavement: Provide one passing density and moisture test per lift of fill per 750 square yards of area.
   3. Below Grass and Landscape Planting Areas: proof roll only. Provide density and moisture tests only where directed by Engineer.
   4. Utility Trenches: Provide one passing density and moisture test per 30 inches of backfill per 300 feet of trench, or more as directed by City or Engineer, at top of subgrade elevation.
   5. Water & Sanitary Sewer Service Line Trenches: Provide two passing density and moisture tests per service line, or more as directed by City or Engineer, at top of subgrade elevation and at mid-depth of trench.
   6. See Section 01 4001 – Quality Control for procedure to follow when additional tests are requested in excess of the minimum required.
   7. If a geotechnical evaluation has been prepared for the project, the recommendations of that evaluation shall govern.

F. Proof roll compacted fill.

3.6 CLEANING

A. Remove unused stockpiled materials, leave area in a clean and neat condition. Grade stockpile area to prevent standing surface water.

B. Leave borrow areas in a clean and neat condition. Grade to prevent standing surface water.

PART 4 MEASUREMENT AND PAYMENT

4.1 MEASUREMENT

A. If specific items are listed on bid form, Engineer will make measurement in accordance with each specific bid item. For lump sum (LS) bid items, measurements will not be made.

4.2 PAYMENT

A. Payment for specific bid items shall be at the unit price bid and shall include all costs for labor, equipment and materials.

END OF SECTION

SECTION 31 2324

FLOWABLE FILL

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Furnishing and placing Flowable Fill, also referred to as Controlled Low-Strength Material (CLSM), as backfill in trenches.

1.2 RELATED REQUIREMENTS

A. Section 31 2316.13 - Trenching: Excavating for utility trenches outside the building to utility main connections.

1.3 REFERENCE STANDARDS

A. ASTM C33 - Standard Specification for Concrete Aggregates.

B. ASTM C94 - Standard Specification for Ready-Mixed Concrete.

C. ASTM C143/C143M - Standard Test Method for Slump of Hydraulic-Cement Concrete.

D. ASTM C150 - Standard Specification for Portland Cement.

E. ASTM C260/260M – Standard Specification for Air-Entraining Admixtures for Concrete.

F. ASTM C494/C494M Rev A - Standard Specification for Chemical Admixtures for Concrete.

G. ASTM C618 - Standard Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use in Concrete.

H. ASTM D4832 - Standard Test Method for Preparation and Testing of Controlled Low Strength (CLSM) Test Cylinders.

I. ASTM D5971 - Standard Practice for Sampling Freshly Mixed Controlled Low-Strength Material.

J. ASTM D6023 - Standard Test Method for Density (Unit Weight), Yield, Cement Content, and Air Content (Gravimetric) of Controlled Low-Strength Material (CLSM).

K. ASTM D6103 - Standard Test Method for Flow Consistency of Controlled Low-Strength Material (CLSM).

L. ACI 304R - Guide for Measuring, Mixing, Transporting, and Placing Concrete; American Concrete Institute International.

1.4 **SUB**MITTALS

A. See Section 01 0130 - Submittals, for submittal procedures.

B. Provide a Flowable Fill mix design prepared by an independent testing laboratory.

C. Provide product data for all materials incorporated into the flowable fill.

PART 2 PRODUCTS

2.1 MATERIALS

A. General
   1. Flowable Fill shall consist of a self-compacting cementitious mixture of aggregate, cement and water.

2. Fly ash and approved admixtures may be used to obtain required mix properties.
3. The mix shall have good workability and flowability with self-compacting and self-leveling characteristics.
4. No changes shall be made in the amounts or sources of the approved mix ingredients without the approval of City or Engineer.

B. Cement: ASTM C150/C150M, Type II, obtained from same source throughout.

C. Fine and Coarse Mix Aggregates: ASTM C33/C33M.
1. Conform to Section 802 of the NDDOT Standard Specifications, current edition.
2. Acquire all aggregates for entire project from the same source.

D. Fly Ash: ASTM C618, Class C or F.

E. Water: Clean, and not detrimental to concrete.

F. Air-Entraining Admixtures: ASTM C260/C260M.

G. Chemical Admixtures: ASTM C494/C494M, Type A - Water Reducing, Type C - Accelerating, and Type G - Water Reducing, High Range and Retarding.
1. Do not use chemicals that will result in soluble chloride ions in excess of 0.1 percent by weight of cement.

2.2 PROPORTIONING

A. Strength: Flowable Fill shall be excavatable and designed for a twenty-eight (28) day compressive strength of between fifty (50) psi and one hundred fifty (150) psi when molded and cured in conformance with ASTM D4832.

B. Cement: Minimum cement content of fifty (50) pounds per cubic yard and maximum fly ash content of two hundred fifty (250) pounds per cubic yard. The water-cementitious materials ratio of the mix shall not exceed three and one-half to one (3.5:1).

C. Air-Entrainment: All Flowable Fill shall be air entrained to a total air content of 4% - 7%.

D. Slump: Shall be six (6) inches minimum and eight (8) inches maximum.

E. Aggregate: Fine aggregate shall be between fifty percent (50%) and sixty percent (60%) by volume of the total aggregates in the mix.

F. Consistency:
1. The consistency of the Flowable Fill shall be such that the material flows easily into all voids and openings without segregation.
2. When trenches are on a steep slope, a stiffer mix may be required to prevent Flowable Fill from flowing down the trench.
3. When a stiffer mix is used, vibration shall be performed to ensure that all spaces between the pipe and the lower portion of the trench are completely filled.

2.3 SOURCE QUALITY CONTROL

A. See Section 01 4001 - Quality Control, for general requirements for testing and analysis of soil material.

B. Provide materials of each type from same source throughout the Work.

PART 3 EXECUTION

3.1 PREPARATION

A. Cut out soft areas of subgrade not capable of compaction in place. Backfill with general fill or other material as directed by Engineer.

B. Compact subgrade to density equal to or greater than requirements for subsequent fill material.

3.2 PLACEMENT

A. Comply with ACI 304R for mixing, transporting and placement.

B. Flowable Fill shall not be placed when trench walls or bottom are frozen or contain frozen materials. Mix and place only when air temperature is 35 degrees Fahrenheit and rising. Flowable Fill shall be at least 40 degrees Fahrenheit at time of placement. Stop mixing and placement when air temperature is 40 degrees Fahrenheit and falling.

C. Employ a placement method that does not disturb or damage other work, that preserves the quality of the material, and that prevents mixing with trench material. Flowable Fill shall be placed as nearly as practical to its final position and shall be consolidated by rodding or mechanical vibration as necessary to completely fill all voids with uniform, homogenous material.

3.3 PROTECTION

A. Protect freshly placed Flowable Fill from premature drying and excessively hot or cold temperatures.

B. Do not place backfill until initial set has been achieved.

3.4 FIELD QUALITY CONTROL

A. See Section 01 4001 - Quality Control, for general requirements for field inspection and testing.

B. Compressive Strength Tests: ASTM D4832. At a minimum, obtain test samples from the first load of every pour and for every 50 cu yd (38.23 cu m) placed thereafter. For each test, mold and cure three concrete test cylinders.
   1. The cylinders comprising one set will be made from the same sample and shall be tested at the following schedule: one (1) cylinder tested at seven (7) days and one (1) at twenty-eight (28) days. The third cylinder shall be held by the testing agency until the City or Engineer orders it tested or disposed of.

C. Slump Testing: Perform slump testing per ASTM D6103 for each sample taken. Slump shall be six (6) inches minimum and eight (8) inches maximum.

D. Air Entrainment: Test air content per ASTM D6023 for each sample of concrete used in making test cylinders. The air content shall fall within the range of 4 percent to 7 percent.

E. Maintain records of placed Flowable Fill. Record date, location of pour, quantity placed, air temperature, and test samples taken.

F. Test Results: The testing agency shall report test results in writing to the City and Engineer within 48 hours of test.

PART 4 MEASUREMENT AND PAYMENT

4.1 MEASUREMENT

A. If a specific item is listed on the bid form for Flowable Fill, measurement will be by the cubic yard based upon field measurement or upon batch delivery tickets provided to the Engineer at the time of placement.

4.2 PAYMENT

A. Payment for specific bid items shall be at the unit price bid and shall include all costs for labor, hauling, placement, equipment and materials. If no bid item is listed for Flowable Fill, all costs shall be incidental.

END OF SECTION

SECTION 31 3280

GEOTEXTILE FABRICS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. This work consists of furnishing and installing geotextile fabric.

1.2 REFERENCES

A. NDDOT Standard Specifications for Road and Bridge Construction, latest edition.

PART 2 PRODUCTS

2.1 MATERIALS

A. Geotextile fabric shall consist of polymeric filament or yarns such as polypropylene, polyethylene, polyester, polyamide, or polyvinylidene chloride. The filaments or yarns shall be formed into a stable network so they retain their relative position to each other. The geotextile shall be inert to commonly encountered chemicals.

B. Geotextile fabrics shall conform to Section 858 - Geosynthetics of the NDDOT Standard Specifications for Road and Bridge Construction, latest edition.

PART 3 EXECUTION

3.1 CONSTRUCTION REQUIREMENTS

A. General
   1. The surface receiving the fabric shall be smooth and free of stones, sticks, and other debris or irregularities that might puncture the fabric. The fabric shall be placed free of wrinkles and shall be protected at all times during construction. Construction equipment shall not be operated on the fabric.
   2. The fabric shall be overlapped a minimum of 18 inches at all splices or joints, or as specified by the manufacturer, whichever is greater. In lieu of joint overlapping, multiple fabric pieces may be sewed if the seaming meets NDDOT Standard Specification Section 709.
   3. The geotextile fabric and a certification of compliance shall be delivered to the project at least 21 days prior to its incorporation into the work. Fabric shall be approved by the City and Engineer before installation.
   4. If the fabric is tested and fails, it shall be removed and replaced at the Contractor's expense.
   5. If sewn seams are going to be used, the Contractor shall also furnish a sewn seam sample, using the same geotextile fabric, thread, seam spacing and number, and overlap distance as are intended or required for use in the work. To facilitate inspection and repair, the geotextile should be placed with all seams up. Sheepsfoot rollers shall not be used for compaction until a minimum of 3 feet of fill is covering the geotextile.
   6. Fabric shall not be left uncovered for longer than five days. Fabric that is not covered within five days shall be removed and replaced at the Contractor's expense.
   7. The fabric shall be secured using the manufacturer's recommended methods to hold the fabric in place during the construction activities.
   8. Before placing material on the fabric, the Contractor shall demonstrate that the placement methods will not damage the fabric. The Engineer may order the removal of at least 4 square yards of material to inspect for fabric damage. Tears or rips in the fabric shall be patched with fabric lapped a minimum of 36 inches around the rip.

B. Geotextile Fabric shall be installed in accordance with NDDOT Standard Specification Section 709 for the specific class of fabric.

C. Shipping and Storage
   1. Geotextile labeling and identification shall comply with ASTM D4873-95. If a label is removed during sampling or other reasons, the roll must be relabeled.
   2. Packaging, handling, and storage of geosynthetics shall conform to ASTM D4873-95 and the following requirements.
      a. Each Geotextile roll shall be wrapped with a waterproof cover or membrane for protection during shipping and storage.
      b. Geotextiles shall not be exposed to ultraviolet light for more than 14 days and shall be elevated off the ground during storage.

PART 4 MEASUREMENT AND PAYMENT

4.1 MEASUREMENT

A. If specific items are listed on the Bid Form. measurement shall be based upon the actual surface area covered to the nearest Square Yard. No allowance will be made for overlaps, drainage trenches, or cutoff trenches unless otherwise shown on the Plans. If no specific items are listed on the Bid Form, Geotextile Fabrics shall be incidental.

4.2 PAYMENT

A. The quantities measured will be paid for at the Unit Price bid, complete and in place.

B. This payment will be full compensation for all labor, equipment, and materials necessary to complete the work.

END OF SECTION

SECTION 32 1207

AGGREGATE MATERIALS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Aggregate materials used for base and surface courses.

1.2 REFERENCES

A. ASTM C136/136M - Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates.

B. ASTM D698 - Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft3 (600 kN-m/m3)).

C. ASTM D1556/D1556M - Standard Test Method for Density and Unit Weight of Soil in Place by the Sand-Cone Method.

D. ASTM D2167 - Standard Test Method for Density and Unit Weight of Soil in Place by the Rubber Balloon Method.

E. ASTM D2487 - Standard Practice for Classification of Soils for Engineering Purposes (Unified Soil Classification System).

F. ASTM D4318 - Standard Test Methods for Liquid Limit, Plastic Limit, and Plasticity Index of Soils (Editorial Change 1, 2014).

G. ASTM D6938 - Standard Test Method for In-Place Density and Water Content of Soil and Soil-Aggregate by Nuclear Methods (Shallow Depth).

H. North Dakota Department of Transportation (NDDOT) Standard and Supplemental Specifications for Road and Bridge Construction, latest edition.

1.3 SUBMITTALS

A. See Section 01 0130 - Submittals for submittal procedures.

B. Samples: Submit 10 lb. sample of each type or class of aggregate to testing laboratory.

C. Materials Sources: Submit name of imported materials source.

D. Aggregate Composition Test Reports: Results of laboratory tests on proposed and actual materials used.

E. Compaction Density Test Reports.

1.4 QUALITY ASSURANCE

A. Employ a competent, approved materials testing laboratory to do all material testing.

1.5 REGULATORY REQUIREMENTS

A. North Dakota State Department of Health:
   1. Solid Waste Division for disposal of debris.
   2. Water Quality Division for storm water runoff and erosion control.
   3. Environmental Health for clean air standards.

1.6 DELIVERY, STORAGE AND HANDLING

A. When necessary, store materials on site in advance of need.

B. When storing aggregate materials on site:
   1. Separate differing materials with dividers or stockpile separately to prevent intermixing.
   2. Prevent contamination.
   3. Protect stockpiles from erosion and deterioration of materials.

1.7 ENVIRONMENTAL REQUIREMENTS

A. Report any soil or water contamination to Engineer immediately.

B. Minimize dust, noise and erosion control by all available means.

C. Develop and enforce an erosion and pollution control plan and program.

PART 2 PRODUCTS

2.1 MATERIALS

A. Aggregate materials shall meet the requirements of NDDOT Standard and Supplemental Specifications for the class of aggregate specified on the plan or elsewhere herein.

B. Unless otherwise stated all base course aggregate shall be NDDOT Class 5 for base and NDDOT Class 13 for surface course.

C. Geotextile Fabric: See Section 31 3280.

2.2 EQUIPMENT

A. One pneumatic tired roller, one motor patrol grader and one water distribution vehicle, all in good operating condition, shall be on site at all times when aggregate is being placed.

B. Pneumatic tired roller shall have at least seven (7) wheels with pneumatic tires of equal size pressure and ply. Wheels shall be arranged to provide complete coverage of area the roller travels. Roller shall have a gross weight of at least 225 pounds per inch of compaction width. Weight shall be certified in writing with copy to Engineer prior to beginning work.

C. Water distribution vehicle shall consist of a watertight tank and spraying device for even distribution of water over the designated area.

D. Motor patrol grader shall be large enough and with enough horsepower to evenly spread and shape the aggregate base being placed.

2.3 SOURCE QUALITY CONTROL

A. See Section 01 4001 - Quality Control, for general requirements for testing and analysis of aggregate materials.

B. Where aggregate materials are specified using ASTM D2487 classification, test and analyze samples for compliance before delivery to site.

C. If tests indicate materials do not meet specified requirements, change material and retest.

D. Provide materials of each type from same source throughout the Work.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify that survey bench marks and intended elevations for the work are as indicated.

B. Verify substrate has been inspected, gradients and elevations are correct, and is dry.

3.2 PREPARATION

A. Subgrade:
   1. The subgrade shall be compacted by approved compaction equipment. Approved compaction equipment shall include sheepsfoot rollers, pneumatic packers, mechanical packers, mechanical rammers, vibratory equipment, trucks, tractors, scrapers, motor graders, and all other types of equipment used in excavating, transporting, and placing the subgrade. Subgrade preparation depths specified on the plans or special provisions or the minimum 6 inches required below the surface of the finished subgrade shall be compacted to 95 percent of Maximum Dry Density in accordance with ASTM D698-Standard Proctor. Moisture content shall conform to Section 31 2323. The surface after compaction shall be true to line, grade, and cross section.
   2. Correct irregularities in substrate gradient and elevation by scarifying, reshaping, and re-compacting.
   3. Prior to placing aggregate base course, the subgrade shall be proof-rolled by the Contractor using suitable equipment (such as a fully loaded water truck or fully loaded dump truck or a tractor-trailer combination), approved for this purpose by the Engineer, before placing and/or spreading operations. Any ruts or soft yielding areas shall be corrected at the Contractor's expense before the next course of material is placed thereon.
   4. If specified in the plans, Geotextile Fabric per Section 31 3280 shall be installed above subgrade prior to placement of base course.
   5. Do not place aggregate on soft, muddy, or frozen surfaces.

3.3 INSTALLATION

A. Except where specified elsewhere, maximum compacted lift depth of aggregate base layers shall be 6 inches.

B. Level and contour surfaces to elevations and gradients indicated.

C. Add water to assist compaction. If excess water is apparent, remove aggregate and aerate to reduce moisture content.

D. Use mechanical tamping equipment in areas inaccessible to compaction equipment.

3.4 TOLERANCES

A. Variation From Design Elevation: Within 1/4 inch.

B. Flatness: Maximum variation of 0.04 ft. measured with 10 foot straight edge.

C. Compacted Thickness: Within 0.02 ft. of specified.

3.5 FIELD QUALITY CONTROL

A. See Section 01 4001 - Quality Control, for general requirements for testing and analysis of aggregate materials.

B. Compaction density testing will be performed on compacted aggregate base course in accordance with ASTM D6938, ASTM D1556, ASTM D2167, or ASTM D2922.

C. Results will be evaluated in relation to compaction curve determined by testing uncompacted material in accordance with ASTM D698 ("standard Proctor").

D. If tests indicate work does not meet specified requirements, remove work, replace and retest at no cost to Owner.

E. Frequency of Tests:
   1. Compaction control tests shall be performed at a rate of one test per 750 square yards of surface area per lift of aggregate course, or a minimum of one test per lift per day.

F. Proof roll compacted aggregate at surfaces that will be under exterior slabs-on-grade and pavement.

3.6 CLEANUP AND PROJECT CLOSEOUT

A. Remove excess stockpile, leave area in a clean and neat condition. Grade site surface to prevent freestanding surface water.

B. If a borrow or waste area is utilized, leave area in a clean and neat condition. Grade to prevent standing surface water.

PART 4 MEASUREMENT AND PAYMENT

4.1 MEASUREMENT

A. If specific bid items are listed on the Bid Form, Engineer will make measurement in accordance with each specific bid item. For lump sum (LS) bid items, measurement will not be made.

B. If Bid Form unit is listed as Ton, Contractor shall submit all load tickets at the end of each working day. Load tickets submitted late will not be considered for payment.

C. If Bid Form unit is listed as Square Yard (SY), measurement will be based upon area measured in the field.

D. If Bid Form unit is based upon Cubic Yard (CY), measurement will be based upon area measured in the field multiplied by plan depth.

4.2 PAYMENT

A. Payment for specific bid items shall be at the unit price bid and shall include all costs for labor, equipment and materials.

END OF SECTION

SECTION 32 1210

CONCRETE PAVING

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Furnishing all labor, materials, accessories, and plans necessary to complete concrete paving.

B. Concrete sidewalks, stair steps, integral curbs, gutters, median barriers, parking areas, and concrete valley gutters.

C. Detectable Warning Panels for ADA curb ramps.

D. Concrete Formwork.

E. Concrete Reinforcement.

F. Joint sealing for concrete expansion joints.

1.2 REFERENCES

A. ACI 211.1 - Standard Practice for Selecting Proportions for Normal, Heavyweight, and Mass Concrete.

B. ACI 304 – Recommended Practice for Measuring, Mixing, Transporting and Placing Concrete.

C. ACI 305R – Hot Weather Concreting.

D. ACI 306R – Cold Weather Concreting.

E. E. ACI 308R – Guide to Curing Concrete; American Concrete Institute International; 2001 (Reapproved 2008).

F. ACI 347R - Guide to Formwork for Concrete; 2014.

G. ASTM A615/A615M - Standard Specification for Deformed and Plain Carbon Steel Bars for Concrete Reinforcement.

H. ASTM A1064/A1064M - Standard Specification for Carbon-Steel Wire and Welded Wire Reinforcement, Plain and Deformed, for Concrete.

I. ASTM C33/C33M - Standard Specification for Concrete Aggregates.

J. ASTM C39/C39M - Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens.

K. ASTM C143/C143M - Standard Test Method for Slump of Hydraulic-Cement Concrete; 2015.

L. ASTM C150/C150M - Standard Specification for Portland Cement.

M. ASTM C231/C231M - Standard Test Method for Air Content of Freshly Mixed Concrete by the Pressure Method; 2014.

N. ASTM C260/C260M - Standard Specification for Air-Entraining Admixtures for Concrete.

O. ASTM C309 - Standard Specification for Liquid Membrane-Forming Compounds for Curing Concrete.

P. ASTM C494/C494M - Standard Specification for Chemical Admixtures for Concrete.

Q. ASTM C1107/C1107M - Standard Specification for Packaged Dry, Hydraulic-Cement Grout (Non-shrink); 2014.

R. ASTM C1193 - Standard Guide for Use of Joint Sealants; 2016.

S. ASTM D1751 - Standard Specification for Preformed Expansion Joint Filler for Concrete Paving and Structural Construction (Non-extruding and Resilient Bituminous Types).

T. North Dakota Department of Transportation (NDDOT) Standard and Supplemental Specifications for Road and Bridge Construction, latest edition.

1.3 PERFORMANCE REQUIREMENTS

A. 28-day compressive strength of 4000 psi for standard concrete.

B. 48-hour compressive strength of 2500 psi for high early strength concrete (when required).

C. 48-hour compressive strength of 2400 psi for non-shrink grout (where required).

1.4 SUBMITTALS

A. Provide a concrete mix design prepared by an independent testing laboratory.

B. Provide manufacturers' product data.

C. Provide written explanation from Ready-Mix Supplier as to how concrete will be delivered and what, if any, special measures will be required.

D. A meeting with the contractor, ready-mix supplier, testing firm and Engineer in attendance, is required. The meeting shall be held a minimum of 10 days prior to the beginning of construction. Topics to be addressed will include mix design, specifications, expectations, delivery communications, and testing requirements.

E. Prior to pouring concrete in cold weather, a written request outlining the use of accelerating admixture shall be submitted to the Engineer for approval.

F. Prior to pouring concrete in hot weather, a written request outlining the use of set retarding admixture shall be submitted to the Engineer for approval.

1.5 QUALITY ASSURANCE

A. Acquire cement and aggregate from same source for all work.

B. Provide written documentation for cement, listing manufacturer, and certifying that cement meets specifications.

C. Concrete shall not be poured when the air temperature may fall below 35° F during the pouring or within 24 hours unless preparations are made and precautions taken to prevent any damage to the concrete from the low temperature.

1.6 DELIVERY, STORAGE AND HANDLING

A. Deliver and place concrete in a manner that provides minimum segregation.

1.7 ENVIRONMENTAL REQUIREMENTS

A. Avoid over spraying with curing compound.

B. Properly dispose of all excess curing compound.

C. Utilize appropriate protection against inclement weather.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Cement: Dakota, Holnam, or approved equal.

B. Air Entrainment Admixture: Euclid Chemical, or approved equal.

C. Water Reducing: Euclid Chemical, or approved equal.

D. Non-Shrink Grout: TAMMS Industries, or approved equal.

E. Joint Filler: TAMMS Industries, or approved equal.

F. Curing Compound: TAMMS Industries, or approved equal.

G. Retarding Agent: Euclid Chemical, or approved equal.

H. Vapor Barrier: Up North Plastics, or approved equal.

I. Water Stop (if required): American Colloid Company, Building Material Division, or approved equal.

2.2 MATERIALS

A. CEMENT
   1. Cement shall be an approved and established brand of Portland Cement Type I, Type IA or Type II. Different brands of cement, or the same brand of cement from different mills, shall not be mixed during use without permission from the Engineer. Cement shall be stored in a suitable manner to prevent moisture damage; cement which is partially set or which contains lumps or cakes shall be rejected. The vendor shall provide backup documentation and certifications that the cement used meets these requirements.

B. FLYASH
   1. Fly Ash shall be Class C or F and meet the requirements of ASTM C618 for Portland Cement Concrete. Fly Ash will be allowed as a cement replacement on a 1:1 ratio, up to a maximum of 29% by weight. Do not use fly ash for High-Early strength concrete mixes or during Cold Weather concreting.

C. AGGREGATES
   1. Fine and Coarse Mix Aggregates: ASTM C33/C33M.
      a. Aggregate shall conform to Section 802 of the NDDOT Standard Specifications, current edition.
      b. Acquire all aggregate for entire project from the same source.

D. WATER

   1. Water for concrete shall be clean and free from oil, acid, alkali, and vegetable substances.

E. ADMIXTURES

   1. Air-Entraining Admixtures: ASTM C260/C260M
      a. Air entrainment admixture or air entrained cement is to be used. Entrained air content shall be targeted for 6% and will be between 5% and 8% as measured at the point of placement.
   2. Chemical Admixtures: ASTM C494/C494M, Type A - Water Reducing, Type C - Accelerating, and Type G - Water Reducing, High Range and Retarding.
      a. Do not use chemicals that will result in soluble chloride ions in excess of 0.1 percent by weight of cement.

F. JOINT MATERIAL
   1. Expansion Joints
      a. If expansion or isolation joints are required, they shall be as indicated in the drawings or details. Expansion or isolation joint material shall be Flexcell or approved equal. Joint material thickness will be as specified and or approved, or per manufacturer's recommendation and shall be 1/2 inch less in height than pavement depth. It shall extend the full width of the pavement slab and curb, and any concrete at the ends when the forms are removed shall be chipped away. The dowel support shall securely and rigidly hold the dowel bars and pre-molded filler in correct position during the paving operation. All expansion/isolation joint faces shall be cleaned and sealed with silicon sealant or equal to produce a slightly concave surface 1/4 inch below the concrete surface.
      b. The expansion joint dowel bar assembly shall be of a type as manufactured by Dayton Superior, Wady Industries, Construction Materials, Laclede Steel Company, the American Steel and Wire Company, or an approved equal. The entire expansion joint assembly shall be of a type approved by the Engineer.
   2. Poured Joint Filler may be polymeric or silicone.
      a. Polymeric Sealant: The material for filling poured expansion and contraction joints and cracks shall be hot poured elastic type and shall conform to the requirements of ASTM D-1190. The material shall be composed of a homogeneous blend of virgin polymers, plasticizers, special fillers and asphalt compounded specifically for the sealing of cracks in asphalt or concrete pavement. Ground cured rubber scrap shall not be used. Meadows Safe-Seal 3405 is an approved substitute for the hot pour material.
      b. b. Silicone Joint Sealant: The silicone sealant shall be a Low Modulus Silicone Sealant meeting the requirements of the NDDOT Standard and Supplemental Specifications, Section 826. Self-leveling silicone sealants will not be allowed.

G. Curing Compounds
   1. White-pigmented liquid curing compound conforming to ASTM C309. All curing compounds shall be applied in accordance with the manufacturer's recommendations.

H. Reinforcement
   1. Reinforcing Steel: ASTM A615/A615M, Grade 60 (60,000 psi) (420 MPa) yield strength; deformed billet steel bars; unfinished.
   2. Steel Welded Wire Reinforcement: Plain type, ASTM A185/A185M; in flat sheets; unfinished. Mesh size and gage per drawings.
   3. Dowels: ASTM A36, Grade 60 - 60,000 psi (420 MPa) yield strength; smooth steel bars; unfinished.

I. Formwork
   1. Form Materials: Conform to ACI 301 and ACI 347.
      a. Contractor's choice of standard products with sufficient strength to withstand hydrostatic head without distortion in excess of permitted tolerances.
      b. Form Coating: Release agent that will not adversely affect concrete or interfere with application of coatings.

J. Detectable Warning Panels
   1. Detectable Warning Panels shall consist of square or rectangular panels with a surface of truncated domes, aligned in a square or radial grid pattern. Panels shall extend the full width of all curb ramp landings, and a minimum of 24 inches in the predominant direction of travel. Panels shall be wet-set; surface applied panels will not be allowed.
   2. Detectable Warning Panels shall conform to the requirements of Section 885 - Detectable Warning Panels of the NDDOT Standard Specifications for Road and Bridge Construction, 2014 or current edition.

2.3 PROCEDURES

A. PROPORTIONS

1. A mix design shall be provided to and approved by the Engineer a minimum of 10 days before pouring. Any revisions to the mix design must be approved by the Engineer.
2. One cubic yard of mixed concrete in place shall contain not less than 564 lbs. minimum of cementitious materials. The water- cement ratio shall not exceed 0.45. The slump shall not exceed four (4) inches before addition of admixtures. Minimum 28-day compressive strength shall be 4,000 psi. Entrained air content shall be between 4% and 7%.

B. HIGH EARLY STRENGTH CONCRETE

1. High early strength concrete may be obtained by the following method:
    a. When Type I, Type IA, or Type II cement is used, the cement content shall be increased to 7.2 sacks of cement per cubic yard (676 pounds). No flash is allowed. Water-cement ratios will be as shown in NDDOT Standard and Supplemental Specifications, latest edition, Section 802. for the class of concrete shown.
    b. The use of non-chloride accelerators for high early strength concrete is allowed.
    c. The use of hydration stabilizers to preserve workability of high early strength concrete in route to the project is allowed.
2. High early strength concrete shall be used when specified in the Contract Documents.
3. When the Contractor requests and obtains permission from Engineer to use high early strength concrete, no additional payment will be made for any extra costs incurred in producing and placing the high early strength concrete.
4. Contractor shall provide environment to ensure that high early strength concrete mixes will attain field strength of 3000 psi compressive strength prior to opening to public traffic. At no time may concrete exceed 90° F in temperature while under blankets or other protection devices, nor fall below 60° F during the 24 hour period.

C. MIXING AND TRANSPORTING CONCRETE

1. Procedures shall conform to NDDOT Standard and Supplemental Specifications, latest edition, Section 802.

D. AUXILIARY FINISHING EQUIPMENT AND MATERIAL

The Contractor shall provide the following auxiliary equipment:

1. Straight Edge
    a. Two or more ten (10) foot straight edges of an approved type shall be used. Extra blades shall be provided and used when previously used edges become wavy and warped.
2. Floats
    a. Approved long handled floats, each having a blade at least .5 feet in length and 6 inches in width.
3. Master Straight Edge
    a. All straight edges shall be tested by the master straight edge before being used and shall be tested frequently during their use.
4. Final Surface Finish
    a. The final surface of the concrete pavement shall have a uniform gritty texture, free from excessive harshness and true to the grade and cross sections shown on the plans.
    b. The finish shall conform to NDDOT Standard and Supplemental Specifications, latest edition, Section 550,.
    c. Before brooming or burlap dragging is complete, and before the concrete has taken its initial set, the edges of the slab shall be carefully finished with an edger having a maximum radius of 3/4 inch.

PART 3 CONSTRUCTION

3.1 COLD WEATHER POURING

A. Prior to pouring in cold weather, a written request must be made and approved by the Engineer. Any concrete damaged by freezing shall be replaced by the Contractor at his own expense. Temperature of the concrete when deposited in the forms shall be between 60° and 90° F and maintained at a minimum temperature of 40° F for at least 5 days after placing, or until the concrete attains a compressive strength of 3000 psi. Concrete shall not be placed on a frozen subgrade or base. Any part of the pavement damaged from traffic or other causes occurring prior to the acceptance of the pavement shall be repaired to the satisfaction of the City at the Contractor's expense.

B. Admixtures for curing or temperature control shall be used only as permitted or directed by the City or Engineer. The admixtures shall not be considered as a substitute for any specified curing requirement.

3.2 JOINTS AND SAWING

A. Joints in concrete pavement shall be of the design specified and shall be constructed at the spacing and locations shown on the plans. The Contractor shall establish the joint locations in the field from the plans or standard details. All joints shall be sawed along a true and straight line established by the Contractor and shall not deviate at any point by more than 1/2 inch from the established line.

3.3 TRANSVERSE CONTRACTION JOINTS AND SAWING

A. The location of each transverse joint shall be marked in a manner satisfactory to the Engineer, prior to placement of the concrete and, in the case of joints that are to be sawed; the markings shall be transferred to the fresh concrete as soon as the final finishing operations have been completed. All contraction joints shall be sawed to a sufficient depth to control cracking, but in no case to a depth less than 1/4 of the thickness of the pavement. Transverse joints constructed in the pavement shall be sawcut through the integral or separate curb. The Contractor shall be responsible for sawing to a depth that will prevent uncontrolled cracking. A sufficient number of saw cuts shall be made as soon as possible to relieve the contraction joint tension in the slab. Remaining saw cuts must be made within 24 hours after pouring.

B. The initial sawing shall be accomplished as soon as the condition of the concrete will permit without raveling and before random cracking occurs. The sequence of initial sawing shall be at the Contractor's option. The sawing shall be immediately delayed if any raveling occurs. Water under nozzle pressure shall be used to remove the sawing residue from each joint and the pavement surface immediately after completing the sawing of that joint. Widening of the joints to full width as per dimensions shown on the jointing/sealing detail shall not be performed until the concrete has cured for at least 24 hours and shall be delayed longer when the sawing causes joint raveling.

C. The early entry dry saw "Soft Cut" method of sawing will only be allowed with the Engineers approval for the initial saw cutting. If uncontrolled cracking occurs, removal and replacement of damaged concrete will be at the Contractor`s expense. Concrete is to be removed at the nearest planned longitudinal and transverse joint. The removal and replacement method shall be approved by the Engineer.

3.4 TRANSVERSE EXPANSION JOINTS

A. Expansion joints shall be spaced as shown on the plans and shall be of the preformed type and shall extend entirely through the depth and width of the pavement and through all integral curbs. No concrete shall be left above the expansion material or across the joint, but shall be cut away after the forms are removed.

B. The expansion material and dowel assembly shall be accurately and firmly staked to the subgrade. The top edge of the filler shall be set 1/2 inch below the pavement surface. During the placing of the concrete, the top edge of the filler shall be protected by a removable channel cap. After the concrete has been placed and finished, the cap shall be removed and the joint edged to the specified radius. All expansion/isolation joints shall be cleaned and sealed with silicone or hot pour sealant to produce a slightly concave surface approximately 1/4 inch below the concrete surface.

C. Before the pavement is opened to permanent traffic, the joint shall be cleaned so that there is a clear space of the specified width for the full depth and width of the pavement. It shall then be filled with joint filler which, when cooled, shall be 1/4 inch below the surface of the pavement. Any sealant material on the surface of the pavement shall be removed at the expense of the Contractor.

3.5 TRANSVERSE CONSTRUCTION JOINTS

A. Transverse construction joints shall be constructed at the end of each day and whenever the placing of the concrete is suspended for more than 45 minutes. When the work is suspended near the proper location for an expansion joint, the expansion joint shall be installed in the manner previously specified, except that the concrete shall only be placed on one side of the header. When work is resumed, it shall be placed on the other side.

B. When work is suspended at other locations, a contraction joint shall be formed by securely staking in place, at right angles to the subgrade and centerline of the pavement, a bulkhead of wood or metal cut to the cross section of the pavement and then depositing concrete against it. Before the work is resumed, the bulkhead shall be removed and concrete placed against the face of the older concrete.

C. Transverse construction joints shall only be constructed at planned transverse joint locations.

D. Dowel bars shall be installed for load transfer across the joint. The dowel bars shall be either installed with the construction joint or later drilled in place. If installed with construction joint they shall be held in place midway across the joint, parallel to both the surface and the centerline of the slab by a dowel splicer basket assembly, self-supported dowel sleeve, or other supporting device approved by the Engineer. The dowel bars shall be installed within the tolerances specified above for placing reinforcement. One end of the dowel shall be painted or coated with an approved lubricant.

3.6 LONGITUDINAL JOINTS

A. The longitudinal joint between adjoining, separately constructed pavement shall be constructed as shown on the plans. A key way, as shown on the City of Dickinson Standard Drawings, will be constructed to tie adjoining constructed pavement together.

B. If uncontrolled cracking occurs, the concrete pavement shall be completely removed to the nearest planned longitudinal and transverse joints at the Contractor's expense. The removal and replacement method shall be approved by the Engineer.

3.7 PAVEMENT FINISHING

A. Strike-off and compaction shall be done by both vibration and screed processes. Separate power machines may be used for each process or both processes may be combined in the same machine, provided controls exist enabling the operator to apply either operation separately or both combined.

B. When weather conditions cause rapid drying of the pavement surface a fine mist or fog spray applied to the concrete surface shall be permitted only if approved by the Engineer using any other method to apply water to the concrete surface will not be permitted and will result in non-payment, replacement, and/or repair of the wetted area as determined by the Engineer.

C. Forms shall be left in place for at least 12 hours after placing the concrete, and the method of removing them shall not damage or mar the concrete.

D. The finished surface of the pavement must conform to the grade, alignment, and contour shown on the plans. Immediately following the floating operation, the Contractor shall test the slab surface for trueness with a 10-foot straight edge. The straightedge shall be placed parallel to the pavement centerline and passed over the slab to reveal any high areas or depressions. The high areas or depressions shall be cut or filled as necessary with the long-handled floats and the area checked again with the straight edge. Successive advances of the straight edge shall overlap by 1/2 the length of the straightedge. The entire surface shall be checked until all variations more than 1/8" in 10' have been eliminated. Special care shall be taken at all headers to ensure this variation is held to a minimum.

3.8 CURB FINISHING

A. Curb and Gutter shall be constructed using a slip-form machine or fixed forms. Fixed forms shall be full depth.

B. No grout shall be used to finish the face of the curb. After the concrete is poured into the forms, it shall be puddled, vibrated and spaded to ensure a thorough, dense mixture, eliminate air pockets, and create uniform and smooth sides. Any honeycombing, voids, or exposed aggregate on the back of curb shall be grouted.

C. When weather conditions cause rapid drying of the pavement surface, a fine mist or fog spray applied to the concrete surface shall be permitted only if approved by the Engineer. Using any other method to apply water to the concrete surface will not be permitted and will result in non-payment, replacement, and/or repair of the wetted area as determined by the Engineer.

D. Before the curb concrete has thoroughly set, and while the concrete is still green, the forms shall be removed and the front and top side finished with a float or steel trowel to make a uniform finished surface.
   1. Rounding Corners
      a. Whenever corners are to be rounded, special steel trowels shall be used while the concrete is still workable and the corners constructed to the dimensions herein specified. For combined curb and gutter, the top and side of the curb and gutter may be finished by means of a special shaped trowel or by a curb and gutter machine which shapes the entire surface in accordance with the specified dimensions. This trowel shall be used immediately upon removing the front form while the concrete is still workable but firm enough to stand up.
   2. Smoothness
      a. The top and face of the curb and also the top of the apron on combined curb and gutter must be finished true to line and grade without any irregularities of surface noticeable to the eye. No portion of the surface or face of the curb or gutter section shall depart for more than 1/4 inch from a straight edge 10 feet in length, placed on the curb parallel to the center line of the street, nor shall any part of the exposed surface present a wavy appearance.

E. All joints shall be formed and placed at the specified intervals. When constructed adjacent to concrete pavement, joints shall match the pavement joints. Joint sealing shall be as specified.

F. Concrete shall cure for 72 hours. All surfaces not protected by forms during this period shall be covered with a curing compound.

3.9 PAVEMENT FINAL SURFACE FINISH

A. The edges of the pavement shall be left smooth and true to line, and finished at about the time the concrete takes its initial set.

B. After surface irregularities have been removed and before the concrete attains an initial set, the pavement shall be uniformly textured using a seamless strip of artificial grass, burlap or brooming.

C. In case that an extruding paving machine is used, the texturing material being pulled longitudinally shall be mounted to a self-propelled bridge, operated off of the paving string line, and shall not deviate at any point by more than 1/2 inch from the established alignment.

D. Formed paving brooms shall be drawn across the surface at right angles to the centerline of the pavement, with the stroke of the broom slightly overlapping adjacent strokes. The brooming operation shall apply a uniform texture with 1/16 to 1/8-inch deep striations. Brooms shall be washed and dried at frequent intervals during the day. Any long or coarse bristles that may cause surface irregularities shall be trimmed or cut out, and any brooms that have become worn out shall be discarded.

E. Upon completion of the final finishing the surface texture shall be uniform in appearance and free of surface water, rough or porous spots, irregularities, depressions, and other objectionable features.

F. The Contractor shall mark in each 3,000 square feet of pavement, every 100 LF for continuous pours of new curb and gutter and/or sidewalk, at each end of property lines, every curb and gutter and/or sidewalk patch done per lot and each driveway by stamping the Contractor's name, address and year in which the pavement was constructed. The stamped letter should be 1 inch high and 1/4 inch deep. Contractor's stamp must be approved by the Engineering Department prior to the beginning of construction. Contractor shall be responsible for changing the date on the stamp each year.

3.10 CURING AND PROTECTION

A. Normal Pavement: As soon as the concrete has been textured, the Contractor shall start curing operations. The finished surface shall be sprayed with an approved curing agent on all exposed faces. Sufficient curing compound shall be applied at a rate of approximately 200 SF/gal to ensure a coating as white as a sheet of paper. In lieu of curing agent, the concrete may be cured by wet burlap or other methods approved by the Engineer. When wet burlap or plastic film is used for curing, the curing period shall be at least 5 days. The concrete surface must not be pitted from or damaged from application of water or incidental rain. The Contractor shall protect all concrete from weather conditions, traffic damage, or any other causes occurring prior to its final acceptance. Any damaged section shall be repaired at the Contractor's expense.

B. Colored Pavement: Colored pavement shall be cured with an approved clear curing compound generally defined as a dissipating cure or a wax based cure matching the color of the decorative concrete. Curing procedures should generally follow the guidelines of the color admixture supplier for the concrete in the pavement.

C. Timing of Curing Compound Application: Curing procedures should be undertaken within 1/2 hour of completion of finishing operations or before the wet sheen on the surface of the concrete disappears, whichever occurs first. Evaporation retarders shall be used for interim protection whenever hot, windy or dry conditions quantified by evaporation rates exceeding 0.2 pounds per square foot per hour exist, and shall be used in accordance with manufacturer's recommendations. Evaporation retarders shall not be used as a finishing aid.

3.11 JOINT FILLING AND SEALING

A. Joints shall be filled within 10 days after placement and before opening pavement to traffic.

B. All vertical joint faces shall be cleaned. Oil, asphalt, curing compound, paint, rust, and other foreign materials shall be completely removed. Just before the joints are sealed, the Contractor shall clean the joints with compressed air at a working pressure of at least 90 psi. The joints shall not be sealed when the air temperature is below 40° F.

C. Backer rod shall be used in all joints to control the depth of the filler/sealer material. Rod backer is not required on hot pours to achieve the desired shape of the material, and support the material against indentation and sag. The backer rod shall be compatible with the filler/sealer and not subject to the absorption of water. Clean all surfaces of excess filler and sealant.

D. Transverse joints constructed in the pavement shall be widened and sealed through the integral or separate curb.
   1. Hot Pour Sealant
      a. The joint filler shall be forced into the joint with a pressure type applicator capable of filling the joint from the bottom up to a height approximately 1/4 inch below the pavement surface, without any overflow or spillage onto the pavement surface. Clean all surfaces of excess sealant.
   2. Silicone Sealant
      a. Silicone joint sealer may be used in lieu of hot pour elastic filler. The sealant shall be tooled to produce a slightly concave surface approximately 1/4 inch below the pavement surface. Self-leveling sealant will not be allowed.

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3.12 PAVEMENT ROUGHNESS AND RIDE QUALITY

A. Surface tolerance and ride quality shall conform to NDDOT Standard and Supplemental Specifications, latest edition, Section 550.

3.13 LOCATION OF EXISTING UTILITIES

A. Existing manholes, gate valves, and stop boxes have been shown to direct the Contractor's attention to their existence. The Contractor is cautioned that not all utilities have been shown and their location is not guaranteed. The Contractor is responsible for determining the exact location of existing utilities that affect the installation of the paving.

3.14 MANHOLE CASTINGS TO GRADE

A. This item includes all labor, materials, High Early Strength Concrete, and equipment necessary to adjust the various castings to the proper line and grade. Note that wood shims to adjust rings and castings are not allowed. Changes in grade shall be made as follows:
   1. With Concrete Adjusting Rings
      a. The maximum height of adjustment is 6 inches. Adjustments shall be made with a maximum of two (2) precast adjusting rings whenever possible. For fine adjustments of less than 2 inches, steel shims shall be used to temporarily support the casting. In any case, the castings shall be laid in a full bed of mortar. The rings and cone section shall be cleaned to assure a flat seating surface and the rings installed in alignment with no noticeable offsets. Broken pieces and partial sections of adjusting rings are not allowed. Adjusting rings must be one continuous piece.
   2. With Polyethylene Adjusting Rings
      a. Adjustments shall be made with polyethylene adjustment rings. The cone shall be cleaned and the rings dry stacked to determine the best ring height and slope ring combination to obtain the proper height and slope match. Once this is determined, the rings shall be marked with a vertical line for future reference and disassembled. A 1/4 inch bead of butyl caulk shall be applied to the cone surface and the first ring placed on the cone section. Another head of butyl caulk shall be placed on the bottom of the next ring as close as possible to the male lip and this ring installed interlocking with the first and aligning the vertical line. This procedure is repeated for each adjustment ring, including caulking the joint between the slope ring and the casting.

B. Care shall be taken to adjust the casting to the proper grade so the final riding surface is smooth and free of bumps and it conforms to the alignment and grade of the adjoining concrete. Any castings not satisfying these requirements shall be redone to the satisfaction of the Engineer. Castings should be set flush to 1/4 inch below the pavement surface.

C. The casting to grade item also includes cleaning all construction debris or dirt from the manhole or inlet bottom and installing a wiped mortar finish around the inside circumference of the precast concrete adjusting rings.

D. All sanitary sewer and storm sewer manholes within concrete pavement areas shall have internal chimney seals, and all sanitary sewer and storm sewer manholes within unpaved areas or grassed areas shall have external chimney seals.

3.15 GATE VALVE BOXES TO GRADE

A. This item shall include all labor, material, High Early Strength Concrete, and equipment necessary to raise or lower water gate boxes to the final grade. Care shall be taken to adjust the valve box to the proper grade so the final riding surface is smooth and free of bumps and that it conforms to the grade of the adjoining concrete. The alignment shall be checked to ensure that the box is straight and that the valve is operable. Any valve boxes not satisfying these requirements shall be redone to the satisfaction of the Engineer. Valve boxes should be set within 1/4 inch of the finished pavement surface. The gate box to grade item also includes cleaning all construction debris or dirt from the box, insuring that the box is straight and undamaged, and insuring that the valve is operable.

3.16 CONCRETE TESTING

A. A third-party Material Testing Firm is required to be employed at the Contractor's expense to take a minimum of 5 cylinder samples; these cylinder samples will be labeled as such:
   1. Field Cure
   2. 7 Day Break (lab cured)
   3. 14 Day Break (lab cured)
   4. 28 Day Break (lab cured)
   5. Extra.

B. Testing is required for the first pour each day and at 100 cubic yard intervals thereafter for pours that exceed 100 cubic yards. For pours that are less than 100 cubic yards, testing will be done on every pour. A Field Technician will be required to obtain batch ticket from the delivery driver on every test cylinder that is to be tested. A Field Technician shall complete slump and air testing at the project location. Concrete test specimens for compression strength tests will be made and cured according to accepted ASTM procedures. The Contractor shall cooperate in the making of such tests.

C. Material Testing Firms shall comply with ACI 318 in regard to supplying Engineer, Contractors, concrete suppliers and other designated individuals with notification of concrete field test results such as slump, water content and air content immediately, and compression strength test results within 48 hours after test completion.

3.17 DEFECTIVE CONCRETE

A. Defective Concrete:
   1. Concrete not conforming to required lines, details, dimensions, tolerances or specified requirements.
   2. Concrete failing to meet specifications for compressive strength, air entrainment, consistency (slump) and/or composition.
   3. Concrete that is excessively honey-combed or contains embedded debris.
   4. Concrete that is spalling, experiencing surface delamination, and/or any other form of premature degradation.

B. Any concrete not meeting the requirements of this Section 32 1313 or any other requirements of the contract documents shall be replaced by the Contractor to the satisfaction of the Engineer at no cost to the City. Replaced concrete shall be tested at the same schedule as other concrete and such testing shall be incidental.

3.18 OPENING TO TRAFFIC

A. Newly constructed pavement shall not be opened to public traffic until all joints are sealed and the concrete has attained a flexural strength of 450 psi or a compressive strength of 3,000 psi, as determined by breaking test cylinders cured in the field in a manner that replicates as closely as possible the curing conditions of the pavement. The Contractor shall erect and maintain suitable barricades and lights to protect the pavement from traffic. Any part of the pavement damaged from traffic or other causes occurring prior to the acceptance of the pavement shall be repaired to the satisfaction of the Engineer at the Contractor's expense. The Contractor shall be allowed to open the street as long as the requirements have been met as stated in sections:
   1. SECTION 3.11 - JOINT FILLING AND SEALING
   2. SECTION 3.12 - PAVEMENT ROUGHNESS AND RIDE QUALITY
   3. SECTION 3.16 – CONCRETE TESTING

PART 4 MEASUREMENT AND PAYMENT

4.1 MEASUREMENT

A. Concrete pavement shall be paid for at the unit price bid on the Bid Form. Concrete pavement shall include the area of paving only and does not include curb or gutter pan.

B. Curb and gutter will be measured along the curb face and paid for at the unit price bid for hand-placed or machine-placed curb and gutter. Where integral curb is poured, paving and curb will be measured based on a standard 24-inch wide curb and gutter section.

C. Concrete Valley gutters will be measured and paid for at the unit price bid.

4.2 CONCRETE SIDE WALKS. DRIVE WAYS, AND IMPRESSIONED CONCRETE

A. Sidewalks, driveways, and impressioned concrete shall be measured and paid for at the unit price bid.

4.3 PAYMENT

A. All costs for formwork, reinforcing steel, adjusting castings to grade, gate valve box adjustments, curing and protection, jointing and joint filling/sealing, and all other costs or work necessary to properly complete the work specified herein shall be incidental to other items unless specific bid items are included on the Bid Form.

END OF SECTION

SECTION 32 1501

TACK COAT

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Types of bituminous product and application procedure.

1.2 REFERENCES

A. Asphalt Institute Manual Series No. 19.

B. North Dakota Department of Transportation (NDDOT) Standard and Supplemental Specifications for Road and Bridge Construction, latest edition.

1.3 PERFORMANCE REQUIREMENTS

A. Must ensure a bond between the new asphalt pavement surface and existing pavement surface.

1.4 SUBMITTALS

A. Inform Engineer in writing what product will be used and how it will be applied.

B. Follow requirements in Section 01 0130 – Submittals.

1.5 QUALITY ASSURANCE

A. Provide written certification that product meets specifications.

1.6 REGULATORY REQUIREMENTS

A. North Dakota State Department of Health:
   1. Solid Waste Division for disposal of debris.
   2. Water Quality Division for storm water runoff and erosion control.
   3. Environmental Health for clean air standards.

1.7 ENVIRONMENTAL REQUIREMENTS

A. Provide barricades to protect the general public from coming in contact with sprayed oil.

B. Never spray tack oil if weather conditions call for rain before the tack oil can cure out.

PART 2 PRODUCTS

2.1 MATERIALS

A. SS-1H Emulsion or CSS-1H Emulsion or MS-1 Emulsion
   1. Water should be clean and free of impurities, either in solution or colloidal suspension. Carefully monitor the presence of ions, both positive and negative.
   2. Check emulsifying agents for compatibility with the water and the asphalt cement being used.
   3. Dilute tack oil with water at a 50:50 ratio.

PART 3 EXECUTION

3.1 EXAMINATION

A. All equipment shall conform to NDDOT Standard and Supplemental Specifications, latest edition, Sections 151, 152, and 153.

3.2 FIELD QUALITY CONTROL

A. Never allow asphalt emulsion to freeze.

B. Never overheat asphalt emulsion.

C. When diluting, always check compatibility of water with the emulsion by physical test.

D. When diluting, always add water slowly to asphalt. Never add asphalt to water

3.3 APPLICATION

A. Use pumps with proper clearances for handling to avoid binding and seizing. Avoid repeated pump cycling or frequent pumping.

B. DO NOT mix different classes, grades or types of emulsified asphalt in storage tanks, transports or distributors. Make sure tanks are totally clean before changing to another class, grade or type.

C. Always pump from bottom of tank.

D. Always maintain proper distributor spray bar height and spray nozzle angle.

E. Always maintain proper distributor speed.

F. Always sweep and clean surfaces to be tack coated.

G. Never apply more tack coating than can be covered by the same day's operation.

H. Never apply tack coating when ambient air temperature is consistently below 40 degrees Fahrenheit or when surface is wet.

I. Never over spread tack coating. If "fat spots" develop always spread out excess oil by pneumatic tire rolling before placing pavement.

J. Always allow enough time for tack coat to "break" before placing pavement.

3.4 PROTECTION OF FINISHED WORK

A. Never allow traffic on freshly tacked area.

3.5 SCHEDULES

A. Schedule work so as to cause minimal traffic interference.

B. Schedule work to minimize the time that the tack is uncovered.

PART 4 MEASUREMENT AND PAYMENT

4.1 MEASUREMENT

A. Tack coat will be measured by the gallon of actual, undiluted oil if a separate proposal item is listed on the bid form. A gallon is defined as a volume of 231 cubic inches at a temperature of 60 degrees Fahrenheit.

B. If there is not a bid item on the bid form tack coat will not be measured.

4.2 PAYMENT

A. If a separate bid item is listed on the bid form payment will include all costs of material and application.

B. If no separate bid item is listed, consider tack oil incidental to the price bid for asphalt mix.

END OF SECTION

SECTION 32 1513

HOT ASPHALTIC CONCRETE PAVING

(ORDINARY DENSITY)

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Hot asphaltic concrete paving components, mixing, hauling and placement.

1.2 REFERENCES

A. ASTM D946 – Penetration-Graded Asphalt Cement for Use in Pavement Construction.

B. ASTM D2950/D2950M - Standard Test Method for Density of Bituminous Concrete in Place by Nuclear Methods; 2014.

C. ASTM D6927 - Standard Test Method for Marshall Stability and Flow of Asphalt Mixtures; 2015

D. TAI - (The Asphalt Institute) – MS-2 Mix Design Methods for Asphalt Concrete and Other Hot Mix Types.

E. TAI - (The Asphalt Institute) – MS-3 Asphalt Plant Manual.

F. TAI - (The Asphalt Institute) – MS-8 Asphalt Paving Manual.

G. TAI - (The Asphalt Institute) – MS-19 Basic Asphalt Emulsion Manual.

H. TAI – (The Asphalt Institute) – MS-22 Principals of Construction of Hot Mix Asphalt Pavements.

I. North Dakota Department of Transportation (NDDOT) Standard and Supplemental Specifications for Road and Bridge Construction, latest edition.

1.3 PERFORMANCE REQUIREMENTS

A. Provide a smooth surface, consistent and uniform in mixture and density which does not display unusual wear, displacement or raveling within 12 months of placement.

1.4 SUBMITTALS

A. Provide asphaltic concrete mix design no less than 15 days prior to beginning construction.

B. Provide plan for maintenance of traffic (if required).

C. Follow requirements in Section 01 0130 – Submittals.

1.5 QUALITY ASSURANCE

A. Provide Engineer with Manufacturers written certification that each transport load of asphalt cement (AC) meets the requirements of the specification.

B. Mixing Plant: Conform to NDDOT Standard and Supplemental Specifications, latest edition.

C. Obtain asphaltic mix materials (aggregate and bitumen) from same source throughout entire project. Provide new mix design any time a change in source is made.

1.6 REGULATORY REQUIREMENTS

A. Conform to North Dakota Department of Health Clean Air Standards and Surface Water Runoff Standards.

1.7 DELIVERY, STORAGE AND HANDLING

A. Deliver, store and handle aggregate and bitumen in a way that will prevent contamination or separation.

1.8 ENVIRONMENTAL REQUIREMENTS

A. Do not place asphalt when ambient air temperature is less than 35 degrees Fahrenheit or surface is wet or frozen.

B. Dispose of all waste material or reject material in an approved landfill.

PART 2 PRODUCTS

2.1 MATERIALS

A. Bituminous Materials. Conform to the requirements of Section 818 of the North Dakota Department of Transportation (NDDOT) Standard and Supplemental Specifications, latest edition...

B. Aggregate for Mix: Conform to the requirements of Section 430.03, of the North Dakota Department of Transportation (NDDOT) Standard Specifications, latest edition. All aggregate larger than the No. 4 sieve shall have a specific gravity of minimum 2.45..

C. Mineral Filler: Finely ground particles of limestone, hydrated lime or other mineral dust, free of foreign matter, specifically approved for use by the Engineer.

D. Geotextile Fabric (If Required): Per Section 31 3280.

2.2 ASPHALT PAVING MIX

A. Mix Design: Conform to NDDOT Standard Specifications, Section 430.03.F. Mix design shall be Superpave FAA 40 or 41.

B. For batch or continuous mix plants, heat and dry aggregate to reduce the total moisture content to one-half of 1 percent or less, based on the dry weight of the aggregate.

C. When the drum dryer mixer is used, do not allow the moisture content of the bituminous mixture to exceed 1 percent.

D. Assure accurate proportioning into the mixer by feeding stockpiled aggregate in two or more compartments that can be accurately controlled to supply the proper mixture of aggregate.

E. Introduce all materials uniformly into the mixing plant or the drum dryer in the proportions necessary to produce the required quality. Proportion bitumen within plus or minus 0.24 percentage points of the percentage of bitumen designated.

F. Introduce the required quantities of aggregate and bitumen into the mixer and mix until a uniform and complete coating of aggregate is obtained.

G. The temperature of the bituminous mixture at discharge from the mixer must not exceed 300 degrees F.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify that compacted subgrade and/or aggregate base is ready to support paving and imposed loads.

B. Verify gradients and elevations of base are correct prior to beginning any paving operations.

C. Verify utility castings are properly adjusted prior to beginning paving operations.

D. Verify all appropriate actions such as subgrade repair and tack coating are completed prior to beginning paving operations.

3.2 PREPARATION

A. Implement patching and repair operations when stability or failure problems are visible on the existing surface.
   1. Remove existing surfacing, base and subgrade material as directed by Engineer.
   2. Replace subgrade with select backfill material approved by Engineer in 6 inch layers. Use ordinary compaction.
   3. If directed by Engineer, place an approved aggregate base over the subgrade in 6 inch layers to a point 4 inches below the finished surface. Use ordinary compaction.
   4. Apply tack coating to the edges of existing surfacing.
   5. Place a 2½ inch layer of hot bituminous pavement, with a pavement machine. Compact with steel roller and rubber tire roller and allow to cool to ambient temperature before placing next layer.
   6. Apply remaining layers of hot bituminous pavement as described below.

B. When existing surface is irregular, has unusually large cracks or depressions or section is not uniform, correct before overlaying.
   1. Clean and sweep all loose debris from surface.
   2. Apply tack coat.
   3. Apply a leveling course with hot bituminous pavement. Compact with rubber tire roller.
   4. Maintain a hot bituminous loose layer thickness of no more than 3 inches. Apply more than one layer if necessary. Allow each layer to cool overnight before next layer is placed.

C. Tack Coat
   1. Apply tack coat in accordance with NDDOT Standard Specifications and Section 32 1501 – Tack Coat.
   2. If required by field conditions, and if directed by Engineer, apply tack coat over base course surface at uniform rate of 0.1 gal/sq yd.
   3. Apply tack coat to contact surfaces of curbs and gutters and other concrete appurtenances.
   4. Coat surfaces of manhole frames with oil to prevent bond with asphalt pavement. Do not tack coat these surfaces.
   5. DO NOT mix different classes, grades or types of emulsified asphalt in storage tanks, transports or distributors.
   6. Always pump from bottom of tank.
   7. Always maintain proper distributor spray bar height and spray nozzle angle.
   8. Always maintain proper distributor speed.
   9. Always sweep and clean surfaces to be tack coated.
   10. Never apply more tack coating than can be covered by the same day's operation.

3.3 PLACEMENT

A. Maintain a mix laydown temperature of no less than 230 degrees Fahrenheit when ambient temperature is 60 degrees Fahrenheit or higher. When ambient temperature is below 60 degrees Fahrenheit, Engineer will determine laydown temperature.

B. Spread and finish all mixtures with a self-propelled, bituminous paver, to the required section, leaving the mixture uniformly dense, smooth, and free from irregularities. In locations where it is impractical to use self-propelled bituminous pavers, or other types of laydown equipment, a road grader or maintainer may be used if approved by the Engineer.

C. Control the speed of paver to place the mixture uniformly and continuously without tearing or gouging. Do not exceed the Manufacturer's recommendation, and coordinate the paver speed with the output of the plant to provide for a smooth, continuous operation, minimizing starting and stopping.

D. Level, fill or rake all transverse and longitudinal joints, high or low areas, and surface irregularities, prior to compaction. Immediately remove material dropped on previously compacted lanes.

E. Sweep and tack previously placed layer or surface before spreading the next layer.

F. Tack all joints and coordinate vertical construction joints in successive courses so the joints do not fall on the same vertical plane.

G. Place pavement uniformly against the surface or edge of curb, gutters, manholes or similar structures, and at such an elevation so that the pavement is 1/4 inch higher than the edge of the structure after the pavement has been compacted.

H. Correct any low or high defective areas immediately. Correction can be accomplished by patching or cutting out the surface and replacing with fresh, hot bituminous mixture, or by milling the surface.

I. The sequence of rolling operations as well as the type and number of rollers must be commensurate with production, and adequate to obtain the specified density before the mat temperature falls below 185 degrees Fahrenheit.

J. Begin rolling at the edges and proceed parallel to the road centerline, each trip overlapping the previous roller pass. On paving an echelon or abutting a previously placed lane, the longitudinal joint should be rolled first, followed by the regular rolling procedure. Begin rolling at the low elevation and progress to the high elevation by overlapping of longitudinal passes, paralleling the centerline. Immediately correct any displacement resulting from reversing the direction of a roller or from other causes.

K. Thoroughly compact with hand or other mechanical tampers approved by the Engineer any areas not accessible to standard asphalt rollers.

L. Remove and replace any mixture that becomes loose, broken, or becomes mixed with dirt, shows any excess deficiency of bitumen, or is defective in any manner.

M. Do not place hot bituminous mix on a frozen subgrade, or when weather conditions prevent the proper handling or finishing of the bituminous mixtures. Presence of frost particles in or on the subgrade or base course is considered a frozen subgrade.

N. Compact bituminous pavement sloughs with rollers capable of providing a smooth, finished, compacted slough that is free of tire marks and unevenness or drop off.

O. If the daily bitumen cutoff as measured by the Contractor in the presence of the Engineer, deviates from the approved percentage by more than 0.24 percentage points, supply written explanation to the Engineer as to what caused the deviation and what corrective measures were taken prior to beginning the next day's operation.

P. Adjust any casting that is not 1/4 inch below the top of the finished surface. Adjust casting upward if greater than 1/4 inch below the top of the finished surface.

3.4 ASPHALT PAVEMENT DENSITY

A. Initial or breakdown rolling, intermediate rolling, and final or finish rolling shall be accomplished with rollers meeting all requirements of NDDOT Standard Specifications Section 151.02 and which are approved by the Engineer.

B. Asphalt pavement shall be compacted to 95 percent of the Theoretical Maximum Density (Rice Method). Density of field samples shall be tested with a nuclear density gage at specified frequency.

3.5 TOLERANCES

A. Flatness: Maximum variation of 1/4 inch measured with 10-foot straight edge.

B. Compacted Thickness: Within 1/4 inch of specified thickness.

C. Variation from True Elevation: Within 1/8 inch.

D. Asphalt cement content within 0.24 percent of approved mix design as determined by daily cutoff report.

E. Adjacent surface match: New finished surface must be 1/4 inch above any adjacent surface.

3.6 FIELD QUALITY CONTROL

A. See Section 01 4001 - Quality Control, for general requirements for quality control.

B. Asphalt paving mixture shall be field sampled and tested for conformance with the mix design at intervals of one (1) test per 1,000 tons of asphalt pavement produced, or a minimum of one (1) test per lift of pavement per day.

C. The density of the compacted asphalt pavement shall be tested with a nuclear density gauge at a frequency of one (1) test per 1,500 square yards per lift of asphalt pavement, or a minimum of one (1) test per lift of pavement per day.

D. Contractor shall pay for all additional tests and inspection required due to failing work and/or tests, and for any repairs and/or replacement necessitated by failing work.

3.7 CLEANUP AND PROJECT CLOSEOUT

A. Return all disturbed areas to a condition equal to that prior to construction. Clean, remove and dispose of all debris and residue.

B. Reclaim aggregate pit and plant site and obtain written acceptance from Landowner.

3.8 PROTECTION

A. Immediately after placement, protect pavement from mechanical injury until surface temperature is less than 140 degrees F (60 degrees C).

B. Do not allow traffic on the completed surfacing until the mat has been compacted and has cooled sufficiently to prevent damage.

C. Damage to the asphalt pavement due to inadequate protection shall be repaired by the Contractor to the satisfaction of the Engineer at no cost to the City.

3.9 PROJECT RECORD DOCUMENTS

A. Record all underground utilities lowered or raised on the project plans and furnish a copy of “as constructed” plan to Engineer prior to final payment.

PART 4 MEASUREMENT AND PAYMENT

4.1 MEASUREMENT

A. If no specific bid item is listed, no measurement will be taken.

B. For those specific items shown in the bid form measurement will be by the Engineer in the field.
   1. Asphalt cement will be measured by the gallon (GAL) or ton. A gallon is defined as a volume of 231 cubic inches at a temperature of 60 degrees F.
   2. Asphalt paving will be measured by the ton or square yard (SY).

3. Select backfill will be measured by the ton or cubic yard (CY).
4. Aggregate base will be measured by the ton or cubic yard (CY) in place and compacted.
5. Sub - grade preparation will be measured by the lump sum (LS) or square yard (SY).
6. Excavation will be measured by the cubic yard (CY).

4.2 PAYMENT

A. For specific items listed on the bid form, payment will be as follows:
   1. Asphalt Pavement: By the ton or square yard (SY). Includes asphalt pavement mix design, preparing base, supplying to site, placing, compacting/rolling, and testing. Payment will be based upon work accepted by the Engineer. Payment by the ton will be based on wet tons (asphalt cement and aggregate).
   2. Pavement Repair (Patching): By the ton or square yard (SY). Includes asphalt pavement mix design, cutting, removal and disposal of existing surfacing material, preparing base, supplying material to site, placing and compacting/rolling. Payment will be based upon work accepted by the Engineer. Payment by the ton will be based on wet tons (asphalt cement and aggregate).
   3. Asphalt Cement: By the ton or gallon (GAL). Includes material, transportation and related costs.
   4. Select Backfill (if required): According to the quantity accepted by the Engineer. Includes all costs of material, hauling, placement and compaction.
   5. Aggregate Base (if required): According to the quantity accepted by the Engineer. Includes all costs of material, hauling, placement and compaction.
   6. Subgrade Preparation (if required): According to the quantity accepted by the Engineer. Includes all labor and equipment required to prepare subgrade.
   7. Excavation (if required): According to the quantity accepted by the Engineer. Includes all labor and equipment required to excavate, remove and dispose of all material.

B. It is the Contractor's responsibility to remit all weight tickets to the Engineer at the time of delivery to the site. Each ticket must contain the following information:
   1. Date
   2. Time
   3. Mix
   4. Truck Number
   5. Tons Total
   6. Plant Number
   7. Project Number
   8. Load Ticket Number
   9. Tons Running Total, Day and Job

C. If asphalt testing is not listed on the bid form, payment for asphalt testing will be considered incidental to the price bid for asphalt pavement.

END OF SECTION

SECTION 32 9360

SEEDING

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Hydro-Mulching, grass seeding and fertilizing.

B. Straw mulch/punching.

1.2 REFERENCES

A. FS O-F-241 - Fertilizers, Mixed, Commercial.

1.3 QUALITY ASSURANCE

A. Seed and seeding mixture shall be free of all prohibited noxious weed seed and will not contain more than one-half of 1 percent by weight of restricted noxious weed seeds.

B. Origin of the native seed harvest shall be limited to: North Dakota, South Dakota, northern Nebraska, eastern Wyoming, eastern Montana, western Minnesota and southern Manitoba, Canada.

C. All seed shall be tested by a commercial seed testing laboratory within 9 months prior to the planting.

D. The seed bags shall be delivered to the project bearing a tag which shows the following information:
   1. Name and address of supplier.
   2. Supplier's lot number for each kind of seed in the mixture.
   3. Origin (where grown) for each kind of seed.
   4. Purity and germination for each kind of seed.
   5. Date last tested.
   6. Pounds of bulk seed of each kind of seed in each bag.
   7. Total pounds of bulk seed mixture in each bag.
   8. Total pounds of pure live seed of each kind of seed in each bag.
   9. Total pounds of pure live seed mixture in each bag.
   10. Provide certificate of compliance from authority having jurisdiction indicating approval of seed mixture.

1.4 DELIVERY, STORAGE, AND HANDLING

A. Deliver seed mixture in sealed containers. Seed in damaged packaging is not acceptable.

B. Deliver fertilizer in waterproof bags showing weight, chemical analysis, and name of Manufacturer.

PART 2 PRODUCTS

2.1 ACCESSORIES

A. Fertilizer: FS O-F-241; recommended for grass, with 50 percent of the elements derived from organic sources to the following proportions: Nitrogen 20 percent, phosphoric acid 20 percent, soluble potash 10 percent.

B. HydroMulch: Hydraulically applied wood cellulose fiber matrix that has not been treated with germination or growth inhibitive substances. Treated with a tackifier to enhance seed germination, mulch placement and adherence to the soil.

C. Straw Mulch: Mulch consisting of straw from cereal grain or native hay, free of seed-bearing stalks of noxious weeds. At least 50 percent of the stalks by weight shall be 8 inches or greater in length.

D. Water: Clean, fresh and free of substances or matter that could inhibit vigorous growth of grass.

2.2 SEED MIXTURE

A. Type 1: Irrigated Seed Mix:
   1. Arc Kentucky Bluegrass: 25%
   2. Fielder Kentucky Bluegrass: 25%
   3. Park Kentucky Bluegrass: 10%
   4. Shoreline Slender Fescue: 15%
   5. Maxima 1 Creeping Red Fescue: 15%
   6. Fine-Leaf Perennial Ryegrass: 10%
   7. Application Rate: 6 pounds per 1,000 square feet.

B. Type 2: Non-Irrigated Seed Mix - General
   1. Chewings Fescue: 25%
   2. Hard Fescue: 25%
   3. Sheeps Fescue: 25%
   4. Creeping Red Fescue: 25%
   5. Application Rate: 6 pounds per 1,000 square feet.

C. Type 3: Non-Irrigated Seed Mix – Detention Ponds & Slopes:
   1. Kentucky Bluegrass: 40%
   2. Fine-Leaf Perennial Ryegrass: 20%
   3. Brome: 15%
   4. Sheeps Fescue: 10%
   5. Switchgrass: 5%
   6. Slender Wheatgrass: 5%
   7. Timothy: 5%
   8. Application Rate: 6 pounds per 1,000 square feet

2.3 SEED SUPPLIERS

A. Chesak Seed House, Bismarck, ND

B. Rivards Company, Argyle, MN

C. Southwest Grain, Dickinson, ND.

D. Twin City Seed Company, Minneapolis, MN.

E. Warne Chemical and Equipment Company, Rapid City, SD

F. Or approved equal

PART 3 EXECUTION

3.1 EXAMINATION

A. Prepare subgrade in accordance with Section 31 2200.

B. Place topsoil in accordance with Section 31 2200.

C. Verify topsoil is spread to a smooth uniform depth over area to be seeded.

D. Verify that prepared topsoil is ready to receive the Work of this Section.

3.2 FERTILIZING

A. Apply fertilizer at a rate of 15 pounds/10,000 square feet to all areas requiring seeding.

B. Apply after smooth raking of topsoil.

C. Do not apply fertilizer at same time or with same machine as will be used to apply seed.

D. Mix thoroughly into upper 2 inches of topsoil.

E. Lightly water to aid dissipation of fertilizer.

3.3 NORMAL GRASS SEEDING

A. Seed shall be uniformly distributed with a turfgrass drill seeder in two approximately perpendicular passes, at a rate of 3 pounds/1,000 SF per pass.

B. Immediately following seed placement, all seeded areas shall be culti-packed or rolled with a roller not exceeding 112 pounds. Avoid over-compacting soil.

C. Do not seed areas more than that which can be mulched on same day.

D. Do not sow immediately following rain, when ground is too dry, or during windy periods.

E. Apply straw or hydromulch following seed placement and compaction.

F. Following germination, immediately re-seed areas without germinated seeds that are larger than 4 by 4 inches.

3.4 HYDRO-MULCHING

A. Immediately following seeding and compaction, apply hydromulch to a thickness of 3/16 inches. Apply water with a fine spray immediately after hydromulching to saturate soil.

B. Minimum coverage of 95 percent.

3.5 GRASS, HAY OR STRAW MULCH

A. General: The mulch shall be placed within immediately after the seeding has been completed.

Mulching operations shall not be performed during periods of excessively high winds which would preclude the proper placing of the mulch.

Mulch containing excessive moisture that prevents uniform feeding through the machine shall not be used. Bales shall be broken up and loosened as they are fed into the blower to avoid placement of matted or unbroken lumps.

B. Equipment: The mulch shall be machine blown and shall be uniformly distributed over the seeded areas. The machine shall be of a design that minimizes cutting or breaking of the mulching material.

C. Application: The mulch shall be placed uniformly over the seeded areas at the rate of two tons per acre. Approximately 10 percent of the soil surface shall be visible through the mulch blanket before the mulch tiller (punching) operation.

Excessive cover which smothers seedlings of small seeded grasses shall be avoided.

D. Anchoring: The contractor shall use the following method:

1. Punching: Immediately following application, mulch shall be punched in to the soil using a mulch tiller consisting of a series of dull, flat disks with notched or cutout edges. The disks shall be approximately 20 inches in diameter, ¼ inch thick, spaced approximately 8 inches apart, and shall be fitted with scrapers.

The tiller shall be operated on contour, except on slopes steeper than 3:1 where diagonal operations are required using a tractor with dual drive wheels or crawler treads on the tractor to minimize sideslip and rutting to slopes. Tiller members shall be ballasted as necessary to push the mulch into the soil 3 inches with ends of the mulch exposed above the soil surface.

3.6 PLANTING SEASON

A. Non-irrigated grass seeding shall be installed between May 1st and September 1st, and before the ground freezes, unless otherwise approved by the Engineer.

B. Do not sow immediately following rain, when ground is too dry, or during windy periods.

3.7 QUALITY CONTROL

A. All equipment is subject to Engineer's approval before it is used.

B. Maintain seeded areas immediately after placement until grass is well established and exhibits a vigorous growing condition.

C. Immediately reseed areas that show bare spots.

PART 4 MEASUREMENT AND PAYMENT

4.1 MEASUREMENT

A. Measurement will be based on plan quantity.

4.2 PAYMENT

A. Only plan quantity will be paid for seeding. The Contractor is responsible for restoring any staging areas, and areas used to facilitate construction activities. Additional seeding for disturbed areas used to facilitate construction or accommodate contractor method and means will be the responsibility of the Contractor with no additional cost to the Project.

B. Payment for specific bid items shall be at the unit price bid and shall include all costs for labor, equipment and materials.

C. Any required reseeding shall be incidental.

D. Final payment for seeding shall not be issued until the grass is well established and accepted by the City.

END OF SECTION

SECTION 33 0000

TRACER WIRE

PART 1 GENERAL

1.1 SUMMARY

A. Provide tracer wire (locating wire) and accessories for all non-metallic mains.

B. Related Sections:
   1. Section 31 2221 – Trenching, Backfilling and Compaction
   2. Section 33 1116 – Water Utility System
   3. Section 33 3722 – Sanitary Sewage System

C. Basis of Payment: Incidental.

1.2 REFERENCES

A. ASTM D1248 – Polyethylene Plastic Extrusion Materials for Wire and Cable

1.3 QUALITY ASSURANCE

A. Provide tracer wire designed specifically for detecting buried facilities.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Tracer Wire:
   1. Standard of Quality: Design is based on products of Copperhead Industries <http://www.copperheadwire.com>.
   2. Other acceptable Manufacturers: Subject to compliance with specified requirements, acceptable manufacturers and products are:
      a. Manufacturer of comparable products submitted in compliance with Section 01 0130 - Submittals.

B. Connectors:
   1. Standard of Quality: Design is based on DryConn by King Innovation Products <http://www.kinginnovations.com/pro-dryconn.html>.
   2. Other Acceptable Manufacturers: Subject to compliance with specified requirements.
   3. Hydrant tracer wire bracket with PVC conduit.

C. Tracer Wire Access Box
   1. Valvco: Part SEWAB
   2. Copperhead Lite-Duty Tracer Wire Access Box (LD14*TP) in grass areas at hydrant locations.
   3. Copperhead Concrete Driveway Box (CD14*TP) for sidewalks and driveways with light traffic.
   4. Copperhead Roadway Box (RB14*TP) for gate valves and manholes in streets and parking lots with heavy traffic.

2.2 MATERIALS

A. Open Trench/Boring Installation:
   1. Direct burial 12 AWG solid, CCS (Copper Clad Steel), 0.171-inch diameter; boring 8 AWG solid, CCS (copper clad steel) 0.219-inch diameter
   2. Steel core high strength for direct burial, with a rated break load of 1,330 pounds and for boring installation a rated break load of 2,785 pounds.
   3. 0.045-inch high molecular weight, high density polyethylene, complying with ASTM D1248.

4. High flexibility, stretchable to accommodate ground movement.
5. Impact resistant.
6. 30-volt rating.
7. Jacket color: Green - "Sewer"; Blue - "Water", Purple - "Reclaimed Water/Irrigation"
8. Physical, permanent, surface legend on insulating jacket, repeated a minimum of every 2 linear feet.
9. For directional boring 2-8 AWG tracer wires shall be installed with the pipe and connected to the tracer wire at both ends.

B. Connectors:
1. Waterproof and corrosion proof.
2. Prefilled with non-hardening sealant.
3. Lug:
   a. Tin plated high conductivity aluminum with high impact polypropylene housing.
   b. Product: DryConn Direct Bury Lug.
4. Connectors:
   a. CSA certified as both Pressure Type and Direct Bury.
   b. Product: DryConn King Direct Bury.

C. Magnesium Anode
1. Provide 5-pound anode at each:
   a. Hydrant
   b. Every Other Manhole
   c. Connection to existing facilities

PART 3 EXECUTION

3.1 INSTALLATION

A. Approved spliced connection locations: fire hydrant and manhole discharge connections to the main.

B. Except for approved splice connections and repairs, install in continuous manner from discharge manhole to flushing connection, from hydrant to hydrant and manhole to manhole.

C. Install tracer wire parallel with centerline axis of pipe and at "3 o'clock" position.
1. Do not spiral wrap wire to pipe.
2. Do not install under service saddles.
3. Tape tracer wire to pipe.

D. Terminate tracer wires in accordance with Drawings.
1. Terminate in tracer wire access box at each fire hydrant, air release manhole, sanitary manhole, flushing connection and discharge manhole.
2. Provide minimum 3-foot long pigtail at grade termination points within tracer box.
3. Provide 5-pound magnesium anode a maximum of every 1000 feet and at buried pipe ends:
   a. Attach to the main tracer wire by solder.
   b. Remove anode protective cover.
   c. Apply water as directed by manufacturer.

3.2 FIELD QUALITY CONTROL

A. System Testing:
1. Test continuity of conduction in the presence of the Engineer.
2. Connect signal generator at wire termini and trace signal throughout the installation.
3. Locate and repair all breaks in conductivity.

END OF SECTION

SECTION 33 0601

MANHOLES, CLEANOUTS AND COVERS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Standard, and Drop Manholes

B. Manholes with Monolithic Bases

C. Cleanouts

D. Frames, Lids, Covers and Accessories

E. Chimney Seals

1.2 REFERENCES

A. ASTM C478 - Precast reinforced concrete manhole sections.

B. ASTM C923 - Flexible resilient connectors between reinforced concrete manhole structures and pipes.

C. ASTM A48 - Gray iron castings.

D. Federal Specification SS-S-00210(CSA-FSS): Extruded rubber sealant.

E. ASTM C94 - Ready Mix Concrete.

F. ASTM C150 - Portland Cement Type 1.

G. ASTM C144 - Mortar sand.

H. ASTM C207 - Hydrated lime.

I. ASTM C5 - Quicklime.

J. ASTM C91 - Masonry Cement, Type M.

K. ASTM C387 - Packaged, dry, combined materials, for mortar and concrete.

L. ASTM A240 Type 304 Chromium – Nickel Stainless Steel.

1.3 SYSTEM DESCRIPTION

A. Manhole (i.e.: frame, cover, adjusting rings, chimney seal, barrel, cone section, base, and boots) must all fit together securely and allow access to an underground pipe.

B. Cleanout components (i.e.: frame, cover, riser, bends and/or wye) must all fit together securely and provide for a smooth connection to an underground pipe for purposes of cleaning.

1.4 PERFORMANCE REQUIREMENTS

A. All connections and joints are watertight and leak free.

B. Provide smooth and accessible inverts on manholes.

C. Provide smooth and gradual bends on cleanouts.

1.5 SUBMITTALS

A. Prior to shipping any components to the project submit shop drawings to Engineer for review.

B. Allow 15 working days for Engineer to review and comment.

C. Note size, location (angle) and other relevant information.

D. If project involves the handling or bypassing of sanitary sewage, submit a written plan to Engineer explaining how this will be done.

1.6 QUALITY ASSURANCE

A. Manufacturers must certify in writing, if requested by Engineer, that all manholes, cleanouts and appurtenances be constructed within the guidelines of the appropriate ASTM specifications.

B. Company specializing in manufacturing products must have a minimum of five years, documented experience.

C. Precast sections must be legibly stamped with the date cast.

1.7 DELIVERY, STORAGE AND HANDLING

A. Manufacturer is responsible for providing specific instructions for the proper delivery, storage and handling.

B. Install manholes, cleanouts and, components without damage. Immediately remove any damaged components from the project site.

1.8 ENVIRONMENTAL REQUIREMENTS

A. Never discharge any raw, untreated wastewater or debris into the environment.

B. Properly dispose of all solid waste material such as packing bands and wrapping materials.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. North Dakota Concrete Products (Cretex) - Precast manholes, precast adjusting rings

B. Neenah Foundry Co. - Manhole frames and lids, lamphole frames and lids.

C. Press Seal Gasket Corporation - Rubber sealant; flexible gasket connectors.

D. Forterra Specialty Products – Manhole chimney seals.

2.2 MATERIALS

A. Standard and Drop Manholes: Tongue and groove joints, monolithic bases, pre-cast influent and effluent openings, cast-in-place concrete inverts and an eccentric cone section transition to lid with PVC influent drop apparatus.

B. Manhole Frames and Covers: Equal to R-1733 with self-sealing solid type "C" lid as manufactured by Neenah.

C. Meter manhole and Pressure Reducing Valve Manhole: The 36 inch diameter manhole casting shall be a Neenah R-1739-A with a vented lid or approved equal.

Insulated Cover - 4 inch rigid insulation cover ½ inch marine plywood each side with galvanized steel handle and eight stainless steel nuts and bolts. A 2 inch hole shall be drilled through the cover. A 1 ½ inch x 1 ½ inch x 1/8 inch aluminum angel frame around the opening circumference anchored with eight equally paced stainless steel fasteners.

D. Manhole Chimney Seals: Equal to product manufactured by Forterra.

E. Cleanout Frames and Lids: Equal to R-1975 with solid lid as manufactured by Neenah.

F. Connectors: Flexible gasket connectors equal to "PSX" as manufactured by Press-Seal Gasket Corporation.

G. Manhole Adjusting Rings: Modular reinforced precast concrete rings, or HDPE adjusting rings as manufactured by Lad Tech, Inc., as per manufacturer's written instructions.

H. Sealant: Extruded rubber, 1"x1" in roll form on paper, equal to "E-Z Stick" as manufactured by Press-Seal Gasket Company.

I. Mortar: (By volume), Type M: 1 part Portland Cement or masonry cement, ¼ part hydrated lime and 2¾ to 3¾ parts sand.

J. Manhole Invert: Portland cement concrete made from a 6-bag mix and have a 28 day compressive strength of 3000 psi. All inverts shall have smooth finish.

K. Manhole sections shall have built-in lifting devises provided by the manhole manufacturer.

L. All drop manholes shall have piping on the outside of manhole only. No drops are allowed inside of manhole.

PART 3 EXECUTION

3.1 PREPARATION

A. Verify line and grade locations.

B. Verify cast in or built in items are in proper location and elevation.

C. Verify number of sections for correct height. Allow for a maximum of 2 adjusting rings.

D. Coordinate the placement of influent and effluent pipe openings as required for installing flexible gasket connectors and a smooth transition.

3.2 CONSTRUCTION

A. Place monolithic bottom on stable subgrade. Make sure it is level.

B. Place manhole sections plumb and level.

C. Install joint sealant between all manhole sections.

D. Backfill and compact uniformly around manhole or cleanout to required density.

E. Set adjusting rings, frame and cover to correct elevation. Allow for grout between rings. Coordinate with other adjacent work as necessary.

F. Lay adjusting rings in full bed of mortar, uniformly jointed with the manhole section. Adjust and level to meet finished grade.

G. Install Chimney Seals as recommended by manufacturer. External chimney seals are to be on all sanitary manholes within grass areas. Internal chimney seals are to be on all sanitary manholes within pavement areas.

H. Form inverts with cast-in-place concrete, carefully finishing and troweling to true shape of the lower half of the sewer pipe and sloping up of the manhole, providing positive drainage to the flow line and effluent. Flow line of invert shall be smooth finish.

I. Plug all lift holes with mortar.

3.3 TOLERANCES

A. Final elevations for inverts and rim shall be within plus or minus 0.03 feet of the specified or staked elevation.

B. Finished manhole elevations shall always be ¼ inch lower than finished street grade on an existing street.

3.4 FIELD QUALITY CONTROL

A. Provide proper compaction around manholes and cleanouts.

B. Check for proper invert flow.

C. Check for infiltration and exfiltration and correct if necessary.

D. Regularly check temporary sewage handling equipment and piping (if in use) to avoid spills or backup.

E. Provide 5 foot diamond concrete adjustments around manhole casting as per the manhole adjustment detail within the Dickinson Standard Drawings.

3.5 CLEANUP AND PROJECT CLOSEOUT

A. Clean all debris from manholes and cleanouts. Individually remove cover and check each one.

B. Properly adjust all frames to the proposed grade. Wood shims not allowed for adjustment.

3.6 PROJECT RECORD DOCUMENTS

A. Provide Engineer with a complete set of shop drawings showing all changes and what was actually constructed.

PART 4 MEASUREMENT AND PAYMENT

4.1 MEASUREMENT

A. Measure standard manholes, drop manholes and cleanouts by the unit (each) as defined on the bid form.

4.2 PAYMENT

A. Payment for each unit shall include excavating, backfilling, grading, subgrade stabilization, manhole section, influent and effluent openings, cast-in-place inverts, two adjusting rings, frame, lid and/or cover and all related accessories. Chimney Seals (if required) will be considered incidental to the price bid for manholes.

B. If no specific bid item is shown on the proposal, payment will be considered incidental to other related items.

END OF SECTION

SECTION 33 4721

STORM SEWAGE SYSTEM

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Storm sewer drainage piping, fittings and accessories.

1.2 REFERENCES

A. ASTM A48 – Cast Iron Grates and Frames.

B. ASTM C14 – Non-reinforced Concrete Pipe.

C. ASTM C76 – Reinforced Concrete Culvert, Storm Drain and Sewer Pipe.

D. ASTM C175 – Mortar Cement.

E. ASTM C443 - Standard Specification for Joints for Concrete Pipe and Manholes, Using Rubber Gaskets.

F. ASTM C478 – Precast Reinforced Concrete Manhole Sections.

G. ASTM C497 – Methods of Testing Concrete Pipe, Manhole Sections or Tile.

H. ASTM C506 – Reinforced Concrete Arch Culvert, Storm Drain and Sewer Pipe.

I. ASTM D1785 - Standard Specification for Poly(Vinyl Chloride) (PVC) Plastic Pipe, Schedules 40, 80, and 120.

J. ASTM D2321 Standard Practice for Underground Installation of Thermoplastic Pipe.

K. ASTM D2729 – Poly (Vinyl Chloride) (PVC) Sewer Pipe and Fittings.

L. ASTM D3034 – Type PSM Poly (Vinyl Chloride) (PVC) Sewer Pipe and Fittings.

M. ASTM D3212 - Standard Specification for Joints for Drain and Sewer Plastic Pipes Using Flexible Elastomeric Seals; 2007 (Reapproved 2013).

N. ASTM D3350 – Standard Specification for Polyethylene Plastics Pipe & Fitting Materials.

O. ASTM F477 - Standard Specification for Elastomeric Seals (Gaskets) for Joining Plastic Pipe; 2014.

P. ASTM F679 – Poly (Vinyl Chloride) AC Large Diameter Plastic Gravity Sewer Pipe and Fittings.

Q. ASTM F2306 / F2306M - Standard Specification for 12 to 60 in. Annular Corrugated Profile Wall Polyethylene (PE) Pipe and Fittings for Gravity Flow Storm Sewer and Subsurface Drainage Applications; 2015.

R. ASTM F2648 - Standard Specification for 2 to 60 inch [50 to 1500 mm] Annular Corrugated Profile Wall Polyethylene (PE) Pipe and Fittings for Land Drainage Applications; 2013.

S. ASTM F2736 - Standard Specification for 6 to 30 in. (152 To 762 mm) Polypropylene (PP) Corrugated Single Wall Pipe And Double Wall Pipe; 2013 (Editorial Change 1, 2014).

T. ASTM F2881 - Standard Specification for 12 to 60 in. [300 to 1500 mm] Polypropylene (PP) Dual Wall Pipe and Fittings for Non-Pressure Storm Sewer Applications; 2011 (Reapproved 2015).

U. AASHTO M-196 – Corrugated Aluminum Alloy Pipe.

V. AASHTO M-246 – Polymeric-Coated (Pre-Coated) Corrugated Metal Pipe.

W. AASHTO M-252 and M-294 Standard Specifications for Corrugated Polyethylene Pipe 12 inch to 36 inch.

X. North Dakota State Department of Health Rules and Regulations (10 State Standards).

1.3 SUBMITTALS

A. Provide Manufacturer's data indicating pipe specifications, pipe accessories, fittings and appurtenances.

B. Indicate special procedures required to install products specified.

C. Certify that products supplied meet or exceed specified requirements.

D. Allow 15 working days for Engineer to review and comment.

1.4 QUALITY ASSURANCE

A. Stamp each section of pipe and all fittings with the following minimum information:
   1. Concrete Pipe:
      a. Class of Pipe.
      b. Date of Manufacture.
      c. Name or Trademark of Manufacturer.
   2. PVC Pipe:
      a. Name of Manufacturer.
      b. Nominal Pipe Size.
      c. PVC Cell Classification.
      d. PSM, PS and SDR Value.
      e. Applicable ASTM and Code number.
   3. Corrugated Polyethylene Pipe:
      a. Name of Manufacturer.
      b. Size.
   4. Corrugated Aluminum Alloy Pipe:
      a. Name of Manufacturer.
      b. Size.
   5. Polymeric-Coated (Pre-Coated) Corrugated Metal:
      a. Name of Manufacturer.
      b. Size.
   6. Spiral Rib Pipe:
      a. Name of Manufacturer.
      b. Size.

1.5 REGULATORY REQUIREMENTS

A. Conform to North Dakota Department of Health Clean Air Standards and Surface Water Runoff Standards.

B. North Dakota State Department of Health Rules and Regulations (10 State Standards).

1.6 DELIVERY, STORAGE AND HANDLING

A. Handle, deliver and store all pipe and materials in accordance with manufacturer’s recommendations.

B. Immediately remove from site and appropriately dispose of any damaged materials.

C. Use proper equipment to handle all materials.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. North Dakota Concrete Products for concrete pipe, manholes and inlets.

B. Certainteed, Northern Pipe Products for PVC.

C. Advanced Drainage Systems, Inc. (ADS) and HANCOR for polyethylene and polypropylene pipe products.

D. Neenah Foundry Company, East Jord Iron Works, or approved equal, for grates and castings.

E. Johnston – Fargo culvert for metal pipe.

2.2 MATERIALS

A. If not specified on the plans or Bid Form, pipe material shall be selected by the Contractor and approved by the Engineer. Pipe materials shall be limited to those included in this specification.

B. Substitutions: See Section 01 0130 - Submittals.

C. Reinforced Concrete Storm Sewer Pipe: Conform to the requirements of ASTM C76. Unless otherwise specified, all pipe shall be Class III for 24-inch and smaller and Class II for 27-inch and larger in accordance with ASTM C76, Wall B. All pipe sections shall be cast in sections 8 feet, 6 feet, or 4 feet long, except that the variable length sections may be cast in order to match at manholes and inlets.

D. Polyvinyl Chloride Storm Sewer Pipe: Polyvinyl chloride storm sewer (PVC) pipe-15 inches or smaller shall conform to the requirements of ASTM D3034 for type PSM, PVC sewer pipe and shall have an SDR of 35, all of which shall be stamped on the pipe. Polyvinyl chloride sewer pipe 18 inches or larger shall conform to the requirements of ASTM F679-PS46. PVC sewer shall have the elastomeric gasket type joint providing a watertight seal.
   1. Schedule 40 PVC pipe conforming to ASTM D1785 and ASTM D2665 shall be considered an "or-equal" substitution for SDR 35 PVC pipe.

E. Corrugated Polyethylene Pipe: Corrugated Polyethylene Pipe shall be N-12 WT IB per ASTM F2648 as manufactured by ADS, Inc. or approved equal, with integral bell and spigot joints.
   1. 4- through 60-inch joints shall be watertight according to the requirements of ASTM D3212. Gaskets shall meet the requirements of ASTM F477. Gaskets shall be installed by the pipe manufacturer and covered with a removable, protective wrap to ensure the gasket is free from debris. A joint lubricant available from the manufacturer shall be used on the gasket and bell during assembly.
   2. 12- through 60-inch diameters shall have a reinforced bell with a polymer composite band. The bell tolerance device shall be installed by the manufacturer.
   3. Fittings shall conform to ASTM F2306. Bell and spigot connections shall utilize a spun-on or welded bell and valley or saddle gasket meeting the watertight joint performance requirements of ASTM F2306.

F. Polypropylene Pipe: Corrugated Polypropylene Pipe shall be ADS HP Storm as manufactured by ADS, Inc. or approved equal, with smooth interior walls and gasketed, integral bell and spigot joints.
   1. 12- through 30-inch (300 to 750 mm) pipe shall have a smooth interior and annular exterior corrugations and meet or exceed ASTM F2736 and AASHTO M330.
   2. 36- through 60-inch (900 to 1500 mm) pipe shall have a smooth interior and annular exterior corrugations and meet or exceed ASTM F2881 and AASHTO M330.
   3. Pipe shall be joined with a gasketed integral bell & spigot joint meeting the requirements of ASTM F2736 or F2881, for the respective diameters.

4. 12- through 60-inch (300 to 1500 mm) pipe joints shall be watertight according to the requirements of ASTM D3212. Spigots shall have gaskets meeting the requirements of ASTM F477. Gasket shall be installed by the pipe manufacturer and covered with a removable, protective wrap to ensure the gasket is free from debris. A joint lubricant available from the manufacturer shall be used on the gasket and bell during assembly. Pipe bells shall be reinforced with a polymer composite band, installed by the manufacturer.
5. Fittings shall conform to ASTM F2736, ASTM F2881 and AASHTO M330, for the respective diameters. Bell & spigot connections shall utilize a spun-on, welded or integral bell and spigot with gaskets meeting ASTM F477. Bell & spigot fittings joint shall meet the watertight joint performance requirements of ASTM D3212. Corrugated couplings shall be split collar, engaging at least 2 full corrugations.
6. Polypropylene compound for pipe and fitting production shall be impact modified copolymer meeting the material requirements of ASTM F2736, Section 4, ASTM F2881, Section 5 and AASHTO M330, Section 6.1, for the respective diameters.

G. Corrugated Metal Pipe: Shall conform to NDDOT Specification Section 830.02. Corrugated Metal Pipe shall be allowed for culvert crossings on rural road sections only, and any proposed utilization shall be approved in advance by City.

H. Fittings: Same material as pipe molded or formed to suit pipe size and end design, in required tees, bends, elbows, cleanouts, reducers, traps and other configurations.

I. Pipe Bedding and Backfill: As specified in Section 31 2323.

J. Pipe bedding and installation shall conform to all manufacturers requirements.

K. Manholes: See Section 33 0601

L. Pipe Joints:
1. Concrete – Tongue and Grove.
2. PVC – Integral Bell and Spigot.
3. High Density Polyethylene – Integral Bell and Interlock.
4. Steel and Aluminum - Coupling bands which overlap a minimum of 2 corrugations on each end of the pipe. All anchor bolts must be type 304 stainless steel.

M. Mortar Mix: Composed on 1 part by volume Type 1A Portland Cement and 2 parts of mortar sand.

N. Inlet Structures: Round, square or rectangular as shown on the plans. May be precast or cast-in-place. Includes concrete base, invert, casting and two adjusting rings.

O. Inlet Castings and Grates: Single, double, or triple casting which solidly fits on inlet structures and does not rock or rattle when traffic crosses. Manufactured from Class 35B Gray (Cast) Iron.
1. Provide curb and/or gutter inlet frames and grates of a quality equal to the Neenah Foundry, East Jordan Iron Works or approved equal. Provide castings as follows:
   a. Inlet-Type 1: Neenah Foundry Number R3075 with vaned grate, East Jordan Iron Works Number 7020 – Type T5 back with Type M1 grate, or approved equal.
   b. Inlet-Type 2: Neenah Foundry Number R3295 with vaned grate, East Jordan Iron Works Number 7030-Type T5 back with M4 vaned grate, or approved equal.
   c. Inlet-Type 2 Double: Neenah Foundry Number R3295-2 with vaned grate, East Jordan Iron Works Number 7031-Type T5 back with M4 vaned grate, or approved equal.
   d. Inlet-Type 2 Triple: Neenah Foundry Number R3295-3 with vaned grates, East Jordan Iron Works Number 7032-Type T5 back with M4 vaned grates, or approved equal.
   e. Inlet-Mountable Curb Type A: Neenah Foundry Number R3517, East Jordan Iron Works Number V-4410, or approved equal.
   f. Inlet-Mountable Curb Type B: Neenah Foundry Number R3382, East Jordan Iron Works Number V-4440, or approved equal.

P. Manhole Frames and Lids: Equal to Neenah R 1733 or Municipal Casting 306. Lids equal to Neenah Type “K” manufactured from Class 35B Gray (Cast) Iron. Lid and casting must fit on manhole in a solid manner without rocking or rattling when traffic crosses.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify that all area utilities have been located and marked.

B. Verify that excavations are ready to receive Work, and dimensions, and elevations are as indicated on drawings.

C. Verify that pipe and manholes needed are on site and free of defects.

3.2 INSTALLATION

A. Strip all topsoil to a depth of at least 4 inches and stockpile away from excavation and backfill material.

B. Perform excavation to the required elevations.

C. Maintain a trench with 24 inches (12 inches on each side of pipe centered in trench) greater than outside diameter of pipe.

D. Install pipe, manholes, fittings, and accessories in accordance with the line and grade established in the field and manufacturer's instructions. Seal joints watertight.

E. Maintain separation of water lines from sewer piping as follows:
   1. Parallel Installation:
      a. Watermains shall be laid at least 10 feet horizontally from any existing or proposed gravity sanitary or storm sewer, septic tank, or subsoil treatment system. The distance shall be measured edge to edge.
      b. In cases where it is not practical to maintain a 10-foot separation, the reviewing authority may allow deviation on a case-by-case basis, if supported by data from the Design Engineer.
   2. Crossings:
      a. Watermains crossing sewers shall be laid to provide a minimum vertical distance of 18 inches between the outside of the watermain and the outside of the sewer. This shall be the case where the watermain is either above or below the sewer with preference to the watermain located above the sewer.
      b. At crossings, one full length of water pipe shall be located so both joints will be as far from the sewer as possible. Special structural support for the water and sewer pipes may be required.
   3. Exception: When it is impossible to obtain the minimum specified distance, the reviewing authority must specifically approve any variance. Where sewers are being installed the following methods of installation may be used:
      a. Such deviation may allow installation of the watermain closer to a sewer, provided that the watermain is laid in a separate trench or on an undisturbed earth shelf located on one side of the sewer at such an elevation that the bottom of the watermain is at least 18 inches above the top of the gravity sewer.
      b. The sewer materials shall be water works grade 150 psi (1.0 Mpa) pressure rated pipe meeting AWWA standards or pipe approved by the reviewing authority and shall be pressure tested to ensure water tightness.
   4. Force mains: There shall be at least a 10-foot horizontal separation between watermains and sewer force mains. There shall be an 18-inch vertical separation at crossings as required in item 2 - Crossings.
   5. Sewer Manholes: No water pipe shall pass through or encounter any part of a sewer manhole. Watermain should be located at least 10 feet from sewer manholes.

6. Separation of Watermains from Other Sources of Contamination: Design Engineers should exercise caution when locating watermains at or near certain sites such as sewage treatment plants or industrial complexes. On site waste disposal facility including absorption field must be located and avoided. The Engineer must contact the reviewing authority to establish specific design requirements for locating watermains near any source of contamination.

F. Install appropriate bedding (per manufacturer's specifications) for type of pipe being installed.

G. Install haunching for the width of the trench up to the center (springline) of the pipe in no more than 6 inch lifts and thoroughly compact each lift before placing the next lift.

H. Check and maintain 95 percent compacted density in pipe haunching for all pipe except concrete.

I. Keep all pipe, manholes and inlets clean and free of dirt and debris.

J. If unexpected or unmarked utility lines are encountered immediately notify Engineer.

K. Backfill and compact remainder of pipe trench in equal 6 inch lifts. Do not allow equipment to cross pipe until pipe has a minimum of 12 inches of compacted cover.

L. Remove large stones or other hard matter which could damage piping or impede consistent backfilling or compaction.

M. Install inlet grates, flap gates, headwalls, riprap and other appurtenant items as required by plans.

N. Evenly distribute topsoil or roadway surfacing as required when all backfilling and compacting has been completed.

O. Seed as directed where required.

3.3 TOLERANCES

A. Install all gravity pipe to the following tolerances:
   1. Vertical tolerances – plus or minus 0.05 feet of staked grade line.
   2. Horizontal tolerance – plus or minus 0.05 feet of staked alignment.
   3. Separation tolerance – minimum of 10 feet outside diameter between mains

3.4 FIELD QUALITY CONTROL

A. Place pipe by utilizing either a laser or a batter board system.

B. Notify Engineer prior to placing cover over pipe.

C. Employ an experienced, knowledgeable person to oversee the setting of grades, pipe handling, placement and backfilling.

3.5 MANUFACTURER'S FIELD SERVICES

A. If pipe installation involves special trench protection, has special loading concerns, or requires special bedding and haunching, contact supplier who shall request assistance from Manufacturer as needed.

3.6 PROTECTION

A. Maintain a temporary plug in the end of each section until the next (adjoining) section is installed.

B. Protect pipe and bedding from damage or displacement until backfilling operations have been completed.

3.7 CLEANUP AND PROJECT CLOSEOUT

A. When all installation is complete, clean the site of all debris, left over pipes, fittings, and equipment.

B. Level all distributed areas, add topsoil and resurfacing where necessary and reseed if necessary.

C. Replace all asphalt, concrete or gravel surfacing to a condition equal to before construction.

D. Remove all debris from pipe and flush pipe. Dispose of debris.

E. Contact City for project review. Complete all sections.

3.8 PROJECT RECORD DOCUMENTS

A. Accurately record all installed items on “as-constructed” plans.

B. Identify, describe and show any previously uncharted underground utilities.

C. Provide Engineer with a copy of “as-constructed” plans.

PART 4 MEASUREMENT AND PAYMENT

4.1 MEASUREMENT

A. Pipe will be measured by the linear foot (LF) from center to center of manhole, cleanout or catch basin.

4.2 PAYMENT

A. Basis of payment will be based on the units listed on the bid form and based upon the total units installed and accepted by the Engineer in the field.

B. If no specific item is shown on the bid form, consider payment incidental to other items of general construction.

END OF SECTION

SECTION 34 4700

TRAFFIC CONTROL

PART 1 GENERAL

1.1 DESCRIPTION

A. This work consists of furnishing, installing, and maintaining all required traffic control devices according to the traffic control plan details shown on the Plans. This includes Specifications providing for watch persons, flaggers, pilot cars, and necessary precautions for protecting the public, the workers, and the work.

B. All traffic control devices and their placement shall meet the standards and requirements of the Manual on Uniform Traffic Control Devices for Streets and Highways (MUTCD) and the Standard Highway Signs, published by the Federal Highway Administration. All new and used Category I and II Traffic Control Devices shall meet National Cooperative Highway Research Program 350 (NCHRP Report 350) Guidelines.

C. At the Pre-Construction Conference, the Contractor shall provide the Engineer a Letter of Compliance stating that all Category I and II devices are NCHRP Report 350 approved. The Letter of Compliance shall also include approved shop drawings of the signs and devices.

PART 2 PRODUCTS

2.1 MATERIALS AND EQUIPMENT

A. Sign Backing Materials. Materials for sign backing shall be aluminum, steel, plywood, or plastic of the size and thickness shown on the North Dakota Department of Transportation (NDDOT) Standard Drawings. Aluminum or steel backing shall meet Specification Section 34 4755. Plywood backing shall be of exterior grade or be overlaid with a plastic coating, and processed using recommendations of the reflective sheeting manufacturer. Plastic backing shall be processed using recommendations of the reflective sheeting manufacturer.

B. Reflective Sheeting. Orange diamond shaped, rectangular, and square signs shall be faced with Wide Angle Prismatic Fluorescent Retroreflective Sheeting meeting Specification Section 34 4755 item 2.2.G. Barricades and vertical panels shall be Wide Angle Prismatic Retroreflective Sheeting meeting Specification Section 34 4755 item 2.2. F. Flexible reflective sheeting, Type III C, shall be used on drums, cones, flexible delineators, and tubular markers. All remaining signs and sign backgrounds shall be faced with Wide Angle Prismatic Retroreflective Sheeting meeting Specification Section 34 4755, item 2.2.F.

C. Flexible Roll Up Sign. The flexible roll-up sign shall be mounted in a sturdy frame to keep the sign flat and in proper position for viewing by the motorist. The frame shall be attached to a portable stand for placement on the roadbed. The stand shall be weighted or designed to provide stability against wind. Flexible roll-up signs shall be fabricated to meet Specification Section 34 4755, item 2.2.E.2.

D. Flat Sheet Sign Faces. All flat sheet sign faces, except for flexible roll-up signs as provided above, shall be fabricated to meet Specification Section 34 4755, item 2.1.A.

E. Barricades. Barricades shall be constructed of lightweight materials. They shall be the type and length shown on the NDDOT Standard Drawings. Both sides of the barricade rail surface shall be covered with reflective sheeting as specified.

1. Wood Rails. Wood rails shall meet the Standard Rules of the American Lumber Standards. Application of reflective sheeting directly on wood rails shall be made only after all edges and surfaces have been properly sanded, cleaned, sealed, re-sanded, and painted with a prime coat. The painted surface on which the reflective sheeting is applied shall be treated as specified by the reflective sheeting manufacturer. In lieu of treating the painted surface to receive the reflective sheeting, sheet aluminum having a minimum thickness of 0.040 inches may be attached to the barricade rails with non-rust fasteners. The aluminum sheet shall be fabricated and degreased as provided in Specification Section 34 4755, item 2.1.B.1 before applying reflective sheeting.
2. Aluminum Rails. Aluminum rails shall be an extrusion of the size and shape shown on the NDDOT Standard Drawings and shall meet ASTM Designation B 221, Alloy 6063-T6. They shall be fabricated and degreased as provided in Specification Section 34 4755 before applying reflective sheeting.

F. Delineator Drums. Drums shall be approximately 36 inches in height and a minimum of 18 inches in diameter at the top. They shall be constructed of durable plastic with horizontal, circumferential, orange and white reflectorized stripes as shown on the Standard Drawings. The reflectorized stripes shall be fabricated from Type III C, Type IV, or Wide Angle Prismatic flexible reflective sheeting as provided in Specification Section 34 4755, item 2.2. Delineator drums shall be weighted with sand placed at the bottom of the drum or constructed so that they cannot be blown over or displaced by wind or passing traffic, and do not create a hazard if accidentally struck.

G. Traffic Cones. The cones shall be orange in color, shall be a minimum of 28 inches in height with a broadened base, and fabricated from materials that withstand impact. For nighttime use, cones shall have a minimum 6-inch wide white flexible reflectorized band placed a minimum of 3 inches; but not more than 4 inches from the top. An additional 4-inch white reflectorized band shall be placed a minimum of 2 inches below the 6 inch band. The cones shall be weighted at the base to prevent overturning by the wind. The reflectorized band shall be fabricated from Type III C, Type IV or Wide Angle Prismatic flexible reflective sheeting as provided in Specification Section 34 4755, item 2.2.

H. Tubular Markers and Flexible Delineators. These devices shall be used to channelize traffic.
1. Tubular Markers. Tubular markers shall meet the dimensions, color configuration, and installation details as shown on the NDDOT Standard Drawings.
2. Flexible Delineators. The flexible delineators shall be installed in the locations shown on the plans. The posts shall be resilient and be orange in color. The delineator posts shall be made of PVC or polyethylene and shall be preapproved for use by the Design Division. Posts currently approved are Services and Material Co. Inc., Deluxe delineator post and Safety Guide's Traf-Flex Post or Flex Stake.

   The post shall have 4-inch wide white bands as shown on the NDDOT Standard Drawings. The reflective intensity of the bands shall meet the requirements of Type III B, Type III C, or Wide Angle Prismatic flexible reflective sheeting as provided in Specification Section 34 4755, Item 2.2.

I. Vertical Panels. The vertical panels shall meet the dimensions, striping configuration, and colors shown on the NDDOT Standard Drawings. The panels shall be fabricated as specified for flat sheet signs in Specification Section 34 4754.

J. Delineators. Each delineator shall consist of an acrylic plastic or reflective sheeting reflector mounted on a post support according to the NDDOT Standard Drawings.

K. Portable Barriers. Precast Concrete Median. Barriers shall meet the details on the Plans or NDDOT Standard Drawings. Any barriers manufactured after October 1, 2000, must meet the requirements of NCHRP Report 350.

L. Warning Lights. Warning lights are portable, lens directed, enclosed lights. Warning lights shall meet the requirements of the Institute of Transportation Engineers Purchase Specifications for Flashing and Steady Burn Barricade Warning Lights, latest revisions and the following table:

	Type A Low Intensity	Type B High Intensity	Type C Steady Burn
Lens Directional Faces	1 or 2	1	1 or 2
Flash Rate Per Minute	55 to 75	55 to 75	Constant
Flash Duration1	10%	8%	Constant
Min. Effective Intensity2	4.0 Candles	35 Candles	
Min. Beam Candle Power2		2.0 Candles	
Hours of Operation	Dusk to Dawn	24 hrs./day	Dusk to Dawn

1 = Length of time that instantaneous intensity is equal to or greater than effective intensity.
2 = These values shall be maintained within a solid angle 9 degrees on each side of the vertical axis, and 5 degrees above and below the horizontal axis.

M. Advance Warning Flashing or Sequencing Arrow Panels. Advance warning flashing or sequencing arrow panels shall be used to divert and control traffic around construction or maintenance activities.

Advance warning arrow panels shall meet the following requirements:

Advance Warning Flashing or Sequencing Arrow Panel

Type	Minimum Size (in inches)	Minimum No. of Panel Lamps	Minimum Legibility Distance*
A	24x48	12	1/2 mile
B	30x60	13	3/4 mile
C	48x96	15	1 mile

*Minimum legibility requirements are the distances at which the arrow panel message can be comprehended by a driver on a sunny day or a clear night.

The panel face shall be solidly constructed and finished nonreflective black. Panels shall be mounted on a vehicle, trailer, or other suitable support. Vehicle mounted panels shall be provided with remote controls.

Arrow panels shall be equipped with the following mode selection:
1. Left or right flashing or sequencing arrows, and
2. Double flashing arrows, or
3. Left or right sequencing chevrons, and
4. Caution.

Automatic light dimming controls capable of reducing rated lamp voltage a minimum of 50 percent shall be provided on each arrow panel. The dimming shall be controlled by a photoelectric cell which activates at sunup and sundown. The flashing rate of the lamps shall not be less than 25 nor more than 40 flashes per minute.

Minimum lamp “on” time shall be 50 percent for the flashing arrow and 25 percent for the sequential chevron.

The arrow panel lamps or lenses shall be recess mounted or alternately equipped with an upper hood of not less than 180 degrees. The color of the light emitted shall be yellow.

N. High Level Warning Device. This warning device consists of a minimum of 3 flags and, when specified, a Type B high intensity flashing light. The distance from the roadway to the bottom of the flasher lens or the lowest point of all 3 flags shall be at least 8 feet. The flags shall be a minimum of 16 inches square and shall be orange or fluorescent red-orange in color.

O. Flagging. STOP/SLOW Sign Paddles shall meet the details specified in the Standard Drawings. The paddle shall be fastened to a rigid handle of five to eight feet in length. The paddle shall be fabricated from light semi rigid material, and be octagonal in shape. To improve conspicuity, the paddles may be supplemented by one or two symmetrically positioned, alternately flashing, white high intensity lamps on each side.

When nighttime flagging is required, sufficient auxiliary lighting shall be used to illuminate the flagging station. This lighting shall be supplied by the contractor and set up in such a manner so that drivers are not blinded by it. A flashlight with a red transparent glow cone, reflectorized clothing, and a reflectorized stop-slow paddle are required for nighttime flagging operations.

P. Pilot Car. The pilot car shall be a pickup truck or automobile. A 36 inch by 18 inch sign reading “Pilot Car Follow Me,” as detailed in the NDDOT Standard Drawings shall be mounted on the rear of the vehicle and an oscillating or rotating yellow flashing light shall be mounted on the roof of the vehicle.

Q. Portable Signs. All portable sign mounts that are in place longer than 24 hours or are in place after sunset shall be perpendicular to the ground.

PART 3 EXECUTION

3.1 CONSTRUCTION REQUIREMENTS

A. General. The Contractor shall furnish, install, and maintain all required traffic control devices, and shall provide watchpersons and flaggers as necessary to protect the work and to ensure public and workers’ safety. All required control devices shall be available for installation when needed and shall be maintained, relocated, covered, or removed as necessary. Standards for flagging shall be as specified in Item 3.1.X.

When work zone signs placed as shown on the NDDOT Standard Drawings interfere with permanent signs, the work zone signs shall be moved to locations that afford the best results. Messages shall be varied as required.

The Contractor is responsible for providing the required traffic control to ensure public and worker safety. If the Contractor has not furnished, installed, located, maintained or removed one or more traffic control devices as required, the Engineer may:

1. Apply a contract price reduction of $500 per day if deficiencies are not corrected within a 24-hour period after notification.
2. Without notification, have the deficiencies corrected by another Contractor and deduct the cost of the work from monies due or to become due the Contractor.
3. Direct work to cease until the deficiencies have been corrected.

Traffic control devices shall be operated only as long as they are needed. Only those devices that apply to existing conditions shall be in place. Construction sign bases without attached signs shall be marked so they are visible.

The traffic control devices shall have breakaway supports that meet the requirements of the AASHTO Roadside Design Guide Chapter 4 Section 4.1. All signs on fixed supports shall be placed on breakaway supports, unless they are located behind a barrier or crash cushion.

Barricade rails and panels with stripes which begin at the upper right side and slope downward to the lower left side are designated as “right” panels and are to be used on the right side of a traffic lane. Stripes which begin at the upper left side and slope downward to the lower right side are designated as “left” panels and are to be used on the left side of a traffic lane.

B. Project Terminal Signing. Before work is started, the required traffic control devices shall be erected at each end of the project and at various locations within the Project as shown on the traffic control Plan drawings. These control devices shall remain in place and be maintained for the duration of the Project. The Engineer may direct their removal during winter or other lengthy periods of suspension.

C. Work Area Signing. Appropriate traffic control devices as shown on the traffic control Plan drawings shall be erected and maintained for each type of work area required by the operations. When no details are provided for the particular type of construction situation involved, traffic control devices shall be installed according to the MUTCD or as directed by the Engineer. No construction work shall be started until the proper traffic control devices for the work area are in place. If the Contractor's construction operations or sequence requires additional signing, flaggers shall be furnished at the Contractor's expense or construction operations shall be suspended in that area until the condition is corrected and the required signs have been installed.

When traffic is carried through the construction area, two-way traffic shall be maintained when practicable. One way traffic shall be directed by flag persons or maintained under control of an approved traffic signal system. All signs and other control devices shall indicate actual conditions and shall be relocated, removed, or changed as conditions require. Signs necessary only during hours when work is actually being performed shall be removed or completely covered when no work is in progress.

Portable signs shall be used when construction operations in an area are temporary. Temporary operations are those that can generally be completed in five days or less. If unforeseen circumstances occur, such as equipment breakdown, rain, subgrade failures, etc., time will not accrue towards the five-day period.

When portable signs are used, they shall be placed on the shoulder or outside of the traveled lane where they do not pose a hazard to traffic. The portable signs shall be placed in clear view without any sight obstructions to oncoming traffic. When portable signs are not in use, they shall be removed, moved to a minimum of 45 feet from the edge of the traveled lane, or laid down on the in slope. Signs laid on the in slope shall have stand bases constructed so the signs and bases can be placed flat with no portions of the sign or base projecting upward from the in slope more than 6 inches. When it is necessary to place a temporary sign on a paved surface, the sign may be mounted on portable supports for longer than five days.

The portable signs support assembly mounted on trailers shall meet the requirements as specified above for portable signs except as follows. The portable signs mounted on trailers that have passed the crash test required of NCHRP Report 350, as approved by the FHWA, shall be used. When portable signs mounted on trailers are used, they shall be removed, moved a minimum of 45 feet from the edge of the traveled way, or covered so the sign message cannot be read by approaching vehicles.

D. Existing Signs. Existing regulatory traffic signs which must be moved to accommodate construction shall be immediately reset. The cost to remove and reset existing traffic signs to accommodate construction shall be included in the price bid for other items.

E. Route Markers. Route marker signs required for the Project and for Contractor maintained detours will be furnished by the Contractor and shall be installed by the Contractor on supports furnished by and at the Contractor's expense.

F. Detour Signing. The Contractor shall furnish, install, and maintain all traffic control devices for detours.

G. Highways Closed to Traffic. When a detour is provided and traffic is not maintained through the construction area, necessary access to property abutting the Project shall be provided by constructing and maintaining temporary roads and approaches from the nearest crossroad. Traffic shall not be routed over detours not provided in the Contract documents without written authorization from the Engineer.

H. Restricted Speed Zones. Restricted speed zones and the speed limit to be posted for such zones will be designated in the Contract documents or determined by the Engineer.

I. Temporary Suspension. During a temporary suspension of work, the Contractor is responsible for maintaining and protecting traffic. When operations are suspended for the winter or are indefinitely suspended for reasons beyond the Contractor's control, the roadway and the traffic control devices will be maintained by and at the City's expense.

Before suspending operations for the winter, adequate approaches shall be constructed to all crossroads or intersecting roads which have been disturbed by construction operations. Access to the roadway from abutting property shall also be provided. Warning signs, barricades, and other traffic control devices shall be erected (or existing devices removed) as directed by the Engineer. Resetting of signs removed because of a winter suspension will not be measured for payment.

J. Barricade Application. Type I or Type II barricades shall be used as shown in the traffic control plan details where traffic is maintained through the construction area. They may be used singly or in groups to mark a specific hazard, or used in a series to channelize traffic and shall not be set parallel to traffic. On high speed roads or in situations where barricades may be overturned in the wind, the barricades shall be stabilized with sandbags placed on the lower parts of the frame or stays.

When a section of road is closed to traffic, Type III barricades shall be erected at the points of closure. They shall extend completely across the roadway and shoulders or from curb to curb. Where provision must be made for access of equipment and authorized vehicles, the Type III barricades shall be provided with gates or movable sections that can be closed when work is not in progress, or with indirect openings that discourages public entry. Where access is provided through the Type III barricade, an employee shall be designated to assure proper closure at the end of each working day.

When a road or street is closed, but access to local traffic must be furnished, the Type III barricades shall be arranged to permit local use but discourage through traffic. A sign with the appropriate legend concerning use by local traffic shall be installed.

Type III barricades shall be installed at the beginning and end of the project when so indicated in the Contract documents and shall not be placed parallel to traffic.

The required warning signs shall be mounted above the barricades.

If the construction zone encroaches onto sidewalks or crosswalks and pedestrians cannot be diverted to other walkways, barricades may be used to define the path.

K. Drum Application. Drums shall be used to channelize or delineate traffic flow, and may be used singly or in groups to mark specific hazards. When drums are placed in the roadway, advance warning signs are required.

L. Traffic Cone and Tubular Marker Application. Traffic cones and tubular markers used to channelize traffic shall have adequate stability to prevent overturning or displacement by wind. Additional weighting may be required but shall not be so heavy to cause a hazard if struck.

M. Flexible Delineator Application. The delineator base shall be attached to the pavement as shown on the Plans. The Contractor shall maintain the delineators until they are removed. The delineators shall be removed as soon as the new roadway is opened to traffic. The flexible delineators shall remain the property of the Contractor.

If the Contractor uses a two-sided delineator, the delineator shall have the wide side towards traffic. If the delineator is to be seen by side traffic, an additional delineator shall have the wide side placed facing the side traffic. The side traffic delineators shall not be paid for, but shall be included to the price bid for "Flexible Delineators."

If the Contractor uses the butyl pad for attaching the flexible delineator to concrete roadways, the contractor shall remove the butyl pad down as close as possible to the pavement using a mechanical scraper such as a loader-type machine with a bucket.

All costs for providing, installing, maintaining, and removing the flexible delineators with butyl pad when used shall be included in the unit price bid for “Flexible Delineators.”

N. Vertical Panel Application. Vertical panels shall be used as channelizing devices, warning devices, or windrow markers. Vertical panels shall be faced on both sides.

O. Delineator Application. Delineators shall be used in construction areas for guidance, to indicate roadway alignment, and to outline the required vehicle path. Delineators shall not be used as warning devices and, when used in a construction zone, shall be combined with approved warning devices.

Delineators shall be mounted on supports so the reflector is 4 feet above the roadway edge. White reflectors shall be used for delineators installed along the right side of the street or highway. Yellow reflectors shall be used for delineators installed along the left edge of divided streets, divided highways, and one way roads.

Delineator spacing shall be as indicated on the traffic control plan sheets. Along roadway curves, delineators shall be spaced so that several delineators are always visible to the driver.

P. Portable Barrier Application. Traffic control plan sheets may require, or the Contractor may elect to use, portable barriers to separate the work area from the traffic area. For nighttime use, the barriers shall be supplemented by standard delineators or channelizing markings or devices.

When specified, warning lights shall be installed on continuous barriers. The first two warning lights on each side of the roadway shall be Type A flashers, and subsequent lights on the barrier shall be Type C steady burn lights.

The Contractor shall furnish, install, maintain, and remove barrier markers as specified in the Plans. The costs shall be included in the price bid for “Precast Concrete Median Barriers.”

The ends of the barrier shall be protected by crash cushions or by flaring the barrier ends away from the traveled way as shown in the Contract.

Q. Lighting Device Application. Lighting devices shall be provided as required on the traffic control plan sheets to supplement signs, barricades, and other traffic control devices.
   1. Type III or IV Reflective Sheeting. Flashing lights and steady burn lights on signs, drums, vertical panels, and barricades are not required when Type III, Type IV, or wide angle prismatic reflective sheeting is used.
   2. Flashing Lights (Type A, Low Intensity). Type A low intensity flashers shall be used to warn drivers that they are approaching or traveling in a hazardous area.
   3. Flashing Lights (Type B, High Intensity). Traffic control plan sheets require installation of high intensity flashers at extremely hazardous site conditions. The high intensity flashers shall be operated 24 hours per day.
   4. Steady Burn Lights (Type C). The steady burn warning lights shall be used to delineate the edges of the traveled way on detour curves, on lane changes, and along tapers. Spacing of steady burn lights shall be as indicated on the traffic control plan sheets.
   5. Mounting Height of Warning Lights. The mounting height of warning lights shall be as follows:
      a. Barricade and Portable Standards. A minimum height of 36 inches from the bottom of the lens to the roadway.
      b. Signs. The bottom of the light housing shall not be less than 2 inches nor more than 12 inches above the top of the sign.
      c. Vertical Channelizing Devices and Independent Supports. The light shall be at least 4 feet and not more than 5 feet above the pavement.

6. Advance Warning Arrow Panels. The sequencing arrow panels shall be used to provide advance warning and directional information to assist in diverting and controlling traffic around construction activities being conducted on or adjacent to the traveled way. Other traffic control devices may be required in conjunction with the sequencing arrow panel. During nighttime operation of the flashing arrow panels, the lamps shall be automatically dimmed to 50 percent of the output.
7. Floodlights. If construction activities are performed at night, floodlighting shall be provided for the construction area and flagger stations. The area must be adequately illuminated without creating glare in the eyes of drivers

R. High Level Warning Device. High level warning devices shall be used to supplement other controls and devices and shall be required in urban high density traffic situations.

S. Obliteration of Pavement Marking.
1. Removal of existing marking and installation of short term marking shall be as shown on the traffic control plan sheets. Inappropriate existing markings shall be removed and the new delineation placed before opening the affected lane or lanes to traffic.

   Removal of pavement markings shall not permanently damage the surface or texture of the pavement. Where blast cleaning is used for removal of markings or other objectionable material, the sand or other blast material left on the pavement shall be removed immediately.

2. Painting over or masking existing markings shall be allowed only when indicated in the Plans. Obliteration of the pavement markings by use of grinding or a sandblasting method will not be allowed when painting or masking of existing pavement markings is indicated in the Plans.

   Paint shall be mixed so as to closely approximate the color of the in-place pavement. Masking shall be done using removable, nonreflective, preformed tape that minimizes contrast with the pavement. When existing markings are covered rather than obliterated, the cover shall overlap the existing marking by 1 inch on each side.

T. Construction Zone Marking. Yellow short term marking shall be used to delineate traffic flow in opposing directions or mark the left edge of the pavement of divided highway or one way roads. White short term marking shall be used to delineate the separation of traffic flow in the same direction or mark the right edge of the pavement. The short-term markings shall be used in combination with appropriate warning signs, channelizing devices, and delineation to clearly indicate the required vehicle paths.

U. Traffic Control Personnel.

1. Traffic Control Supervisor. When called for on the Plans, the Contractor shall designate a qualified traffic control supervisor. If this traffic control supervisor becomes unavailable on the project, the Contractor shall designate a qualified replacement supervisor.
   a. Qualifications. The traffic control supervisor shall:
      1) Have completed an approved comprehensive course of study based on Part VI of the MUTCD and furnish proof thereof.
      2) Be familiar with the requirements of the traffic control plans and specifications.
      3) Have a total of at least 12 months field experience with traffic control plans, layouts and maintenance.
      4) Be competent to supervise personnel in traffic control operations.
   b. b. Duties. The traffic control supervisor shall:
      1) Provide traffic control as required by the Plans, Specifications, MUTCD, or as directed by the Engineer.
      2) Be on the site daily to supervise the installation, operation, inspection, maintenance, and removal of the traffic control system.
      3) Correct traffic control conditions that cause erratic vehicle movements, unexpected braking, etc.

4) Propose changes to improve traffic flow through the work zone.
5) Be accessible to the job site within one hour of notification and be “on call” on a 24-hour basis.
6) Provide the Engineer with documentation of all traffic control activities required in paragraph (2) above.
7) May perform watchperson duties, as specified in Item 3.U.2.

c. Traffic Control Course. The course prescribed in Item U.1.a(1) above shall be the American Traffic Safety Service Association (ATSSA) 16 hour Traffic Control Supervisor Course, American General Contractor (AGC) 16 hour Traffic Control Supervisor Course, or the 20 hour National Highway Institute (NHI) Course 380003, Design and Operation of Work Zone Traffic Control, or equal.

An equal course shall include the following subjects: Manual and Standard Signs used in Work Areas (three hours); Channelizing Devices and Temporary Barriers, Pavement Markings, Lighting Devices, Arrow Displays and Special Devices, and Devices Location and Placement (four hours); Layout for Traffic Control Devices, Motorist Characteristics, and Options and Alternatives (four hours); Installation and Removal of the Traffic Control Zone, and Operation and Maintenance of the Traffic Control Zone (four hours);Flagging Operations, Legal Liability and Record Keeping, and Emergency Situations (five hours).

Workshops shall be included in the above time frames covering (a) design problems, (b) installation and removal, and (c) operations and maintenance. Each session shall also include a question and answer period.

2. Watchpersons. Watchpersons shall be provided to patrol the project to assure that the traffic control devices are properly placed in accordance with the traffic control plans and standards. The project shall be patrolled at least twice daily, once in the morning prior to work beginning and once in the evening after work is completed. The project shall also be patrolled twice daily on weekends and days when no work is in progress, once each morning and once each evening before sunset.

The Contractor shall provide written documentation to the Engineer of the watchperson’s hours and activities.

The Contractor shall immediately assist the watchperson, whenever needed, to correct conditions that cause erratic traffic movement, unexpected braking, etc., and erect, repair, replace, or relocate the required traffic control devices. Emergency assistance shall be provided to motorists, when needed, due to roadway conditions. Suspension of watchperson service may be permitted during periods of authorized suspension or after substantial completion of the work, provided the job site is in safe condition.

3. Traffic Signal Maintenance. On projects where permanent or interim traffic signals are being installed, the Contractor shall designate an experienced person in this area that can troubleshoot any possible problems that may occur with the traffic signal maintenance. This maintenance person shall be in addition to the traffic control supervisor and the watchperson as specified in Item U.1 and Item U.2.

The traffic signal maintenance person, or experienced alternate, must be accessible to the job site within one hour of notification and be “on call” on a 24-hour basis. In the event of emergency control, refer to Item V.

The Contractor shall be required to maintain the interim or permanent traffic signals until the project has been accepted by the Engineer.

V. Emergency Control. Written notification shall be provided to the Engineer, the Highway Patrol, and local law enforcement agencies, of the names, addresses, and the telephone numbers of the Contractor's Superintendent, an alternate for the Superintendent, Traffic Control Supervisor, Watchperson, and the Traffic Signal Maintenance Person. Either the Superintendent or the alternate shall be on call for notification of any emergencies that may arise during periods when construction operations are not in progress. Changes in the designation of the Superintendent or the alternate shall immediately be made known, in writing, to the Engineer and the law enforcement agencies.

The Contractor's Superintendent or alternate, or traffic control foreman shall meet with the Engineer before work commences to review traffic control plans, and shall be available at all times to periodically discuss modifications to the traffic control plan with the Engineer or his representative.

When an emergency occurs and the Superintendent or alternate are not available to take protective or corrective measures, the City will authorize others to do the necessary work and deduct the cost of the work from the Contractor.

W. Maintenance of Traffic Control Devices. Traffic Control Devices used on the Project will be rated according to the American Traffic Safety Services Association's (ATSSA) Quality Standards for Work Zone Traffic Control Devices. The definitions of "acceptable," "marginal," and "unacceptable" and the evaluation guidelines shall be as defined in ATSSA's Quality Standards for Work Zone Traffic Control Devices.

Except when devices are to become City property (as indicated below), at the time of initial set up and major phase changes, 100 percent of each type of device (signs, barricades, vertical panels, drums, cones, tubular markers, warning lights, arrow panels, etc.) shall be classified as acceptable. The Contractor shall certify in writing to the Engineer that all traffic control devices installed are classified as acceptable.

When the Plans indicate that temporary traffic control devices are to become City property, these devices shall be new upon delivery to the Project and be classified acceptable upon Project completion.

For signs, barricades, vertical panels, drums, cones, tubular markers, and arrow panels the number of acceptable devices of each type may decrease to 75 percent of the initial quantity as a result of damage or deterioration during the course of work. The remaining 25 percent of each type of devices may be in the marginal category. Warning lights shall be "acceptable" or "marginal" at the limits defined in the ATSSA standards. All unacceptable devices found on the job site shall be replaced within 12 hours.

Traffic control devices not covered by the evaluation guidelines shall be maintained to operate effectively and be in good repair.

Traffic control devices shall be cleaned as necessary to remove dirt, mud, or other foreign material which reduces the brightness of the reflectorized sheeting or warning lights.

X. Flagging. Flaggers shall be clean, neat, and fully dressed at all times while on duty either day or night. For daytime work, the flagger's vest, shirt, or jacket shall be orange, yellow, strong yellow green, or fluorescent versions of these colors. For nighttime work, similar outside garments shall be retroreflective. All flagger's vests shall meet ANSI 107-2004 Class 2 or Class 3 risk exposure requirements, when applicable. The retroreflective material shall be orange, yellow, white, silver, strong yellow-green, or a fluorescent version of one of these colors and shall be visible at a minimum distance of 1,000 feet. The retroreflective clothing shall be designed to identify clearly the wearer as a person and be visible through the full range of body motions.

Each flagger shall be furnished with the booklet, Flagging Handbook, and shall observe the rules and regulations contained therein. The Contractor shall obtain copies of the Flagging Handbook from the Department.

Flaggers shall not be assigned other duties while working as authorized flaggers.

The Contractor is responsible for providing trained flaggers. All flaggers must view a flagging video training tape and pass a flagging written examination before performing flagging on the project. The Contractor will acknowledge in writing, before any flagging work begins on the project, that all flaggers will have viewed a flagging video tape and passed a written examination before performing flagging on the project.

Y. Pilot Car. A pilot car shall be used to guide vehicles through or around the construction area when traffic is reduced to a single lane. The pilot car operation must be coordinated with flagging operations or other controls at each end of the one lane section.

Z. Flag Application. Flags shall be attached to warning signs if indicated in the traffic control plan sheets.

PART 4 MEASUREMENT AND PAYMENT

4.1 METHOD OF MEASUREMENT

A. Traffic Control. When "Traffic Control," is included in the Contract as a lump sum, it includes all traffic control necessary for the project construction except as otherwise provided. Payment includes furnishing, installing, and maintaining the required signs, barricades, and other warning devices; relocating or removing devices as dictated by the work progress; and providing watchpersons to patrol the work.

No payment (over the lump sum bid for "Traffic Control") will be authorized for additional traffic control devices required as a result of the Contractor's method or sequence of operation, whether or not the type of operation is included in the typical work area layouts shown on the traffic control plan sheets.

Payment (over the lump sum bid for "Traffic Control") may be authorized for additional traffic control devices if the type or number of such devices requested by the Engineer exceeds the requirements indicated by the typical work area layouts shown on the traffic control plan sheets, or when the need for additional traffic control devices is created as a result of Contract revisions.

B. Obliteration of Pavement Marking. Obliteration of Pavement Marking will be measured, and paid for according to Specification Section 02 4205 - Demolition.

4.2 BASIS OF PAYMENT

A. When the item "Traffic Control" is bid as a Lump Sum, payment for the Contract Lump Sum bid will be made according to the following schedule:

Total Payment To Date	
40%	When all initial traffic control devices required to start construction have been installed.
50%	When Contract is 25% complete.
75%	When Contract is 50% complete.
90%	When Contract is 75% complete.
100%	When Contract is complete.

When additional traffic control devices requested by the Engineer qualify for payment according to item 4.1.A, payment for furnishing and installing such devices will be made using the prices listed in the Rental Rates for Equipment and Traffic Control Devices, published by the Department.

The above payments for installation include the cost of removing or relocating the traffic control devices. No additional payment will be made when traffic control devices are covered up, or temporarily taken out of service, then returned to use.

All standard traffic control devices furnished by the Contractor shall remain the property of the Contractor.

If the Contractor is required to furnish special non-standard signs not shown on the Plans, payment will be made at invoice price plus 15 percent, and the sign will become the Department's property after it has been removed from service. Payment for sign supports and installation of special signs will be made using the prices listed in the Rental Rates for Equipment and Traffic Control Devices, published by the Department.

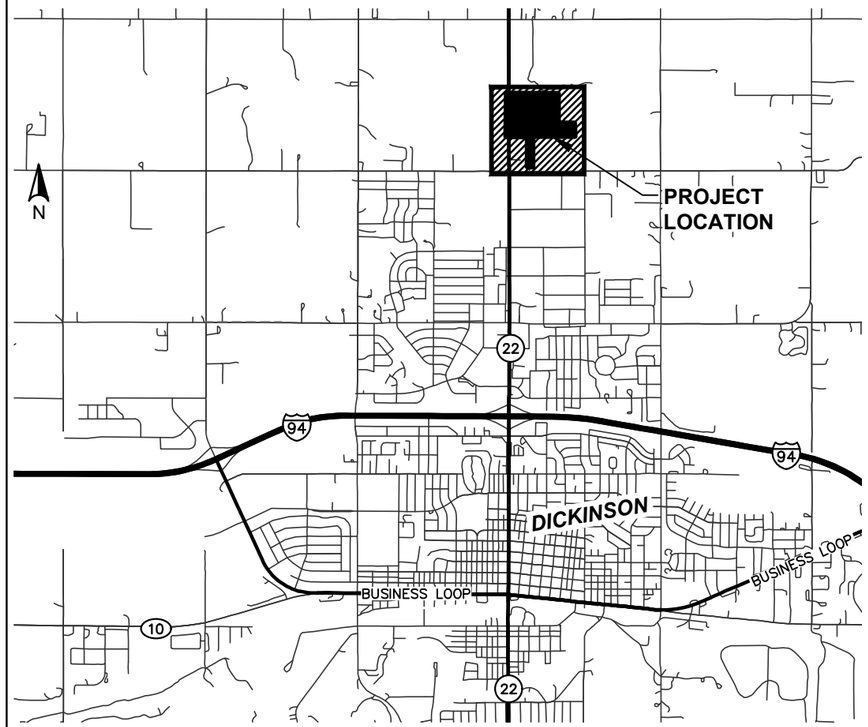
B. Obliteration of Pavement Marking, when included in the Contract as a separate pay item, will be paid for according to Specification Section 02 4205 - Demolition.

C. Items requested by the Engineer that are not listed on the Plans or NDDOT Standard Drawings as incidental items or separate pay items such as Flashing and Steady Burn Lights, Concrete Median Barriers, Attenuation Devices, etc., will be paid for individually.

D. The cost of providing Traffic Control Supervisors, when needed, and Watch persons shall be included in the bid prices for other items.

END OF SECTION

PROJECT NO.	SECTION NO.	SHEET NO.
CITY: 202316 / HE: 231223	1	1



CITY MAP
1"=1 MILE

CITY OF DICKINSON

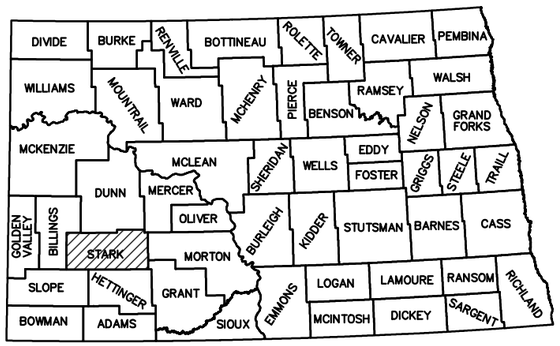
STARK COUNTY, NORTH DAKOTA

3/12/25

IMPROVEMENT PLANS FOR:

NORTH INDUSTRIES STREETS AND STORMWATER

PROJECT NO.
CITY: 202316 / HE: 231223



ND COUNTY MAP

CITY COMMISSIONERS

SCOTT DECKER, MAYOR
DR. ROBERT BAER
JASON FRIDRICH
JOHN ODERMANN
JOE RIDL

CITY ADMINISTRATOR

DUSTIN DASSINGER

CITY DEVELOPMENT DIRECTOR

JOSHUA SKLUZACEK

/S/ Joshua Skluzacek Date: 3/12/25

PUBLIC WORKS DIRECTOR

AARON PRAUS

/S/ Aaron Praus Date: 3/12/25

ENGINEER'S CERTIFICATION:

I HEREBY CERTIFY THAT THE ATTACHED PLANS WERE PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY REGISTERED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF NORTH DAKOTA.

/S/ Andrew Schrank Date: 3/12/25
ANDREW SCHRANK, PE-9814
HIGHLANDS ENGINEERING & SURVEYING, PLLC

HIGHLANDS ENGINEERING
319 24TH STREET EAST
DICKINSON, ND 58601
OFFICE: 701.483.2444
WWW.HIGHLANDSENG.COM

DESIGNERS:

HIGHLANDS ENGINEERING & SURVEYING, PLLC

Project Manager: Andrew Schrank, PE
Design Engineer: Andrew Albrecht, PE

TITLE SHEET

NORTH INDUSTRIES STREETS
AND STORMWATER
DICKINSON, ND

This document was originally issued and sealed by Andrew Schrank Registration Number PE-9814, on 3/12/25 and the original document is stored at the office of Highlands Engineering.

3/12/2025 10:47:58 AM schrank H:\231223\PROJECT CAD\CURRENT\231223_001TS_001_titlesheet.dwg

LEGEND

HIGHLANDS ENGINEERING

PROJECT NO.	SECTION NO.	SHEET NO.
CITY: 202316 / HE: 231223	1	2

EXISTING	PROPOSED		EXISTING	PROPOSED		EXISTING	PROPOSED	
		PROPERTY LINE		11.25 22.5 45 90	FITTINGS			CURB & GUTTER
		EASEMENT		TEE CROSS WYE				
		SECTION LINE		PLUG REDUCER COUPLING				CONCRETE
		SECTION CORNER	SAN		SANITARY SEWER MAIN			
		QUARTER CORNER	SAN		SANITARY SEWER SERVICE			BITUMINOUS SURFACING
		PROPERTY CORNER REBAR	FM		FORCE MAIN			
		BORE LOCATION	S		SANITARY MANHOLE			GRAVEL SURFACING
		BENCHMARK	CL		SANITARY SEWER CLEAN OUT			
		CENTERLINE OF ROADWAY	STM		STORM SEWER / CULVERT			CEMENT STABILIZE SUBGRADE & AGGREGATE SURFACING FOR MAINLINE
UGE	UGE	UNDERGROUND ELECTRIC	D		STORM SEWER MANHOLE			
E	E	ELECTRIC METER			ROUND STORM INLET			CEMENT STABILIZE SUBGRADE & AGGREGATE SURFACING FOR DRIVEWAYS
E	E	ELECTRIC PEDESTAL			SQUARE STORM INLET			
		ELECTRIC OUTLET POST			STORM CURB INLET			
OHE	OHE	OVERHEAD ELECTRIC			TRENCH DRAIN			
		POWER POLE			DRAINWAY			
OR	OR	LIGHT POLE	25##	25##	5' CONTOUR			
		GUY WIRE	25##	25##	1' CONTOUR			
GAS	GAS	NATURAL GAS		25##.## XX	SPOT ELEVATION			
G	G	GAS METER		FG	TOP OF TOPSOIL			
UGT	UGT	UNDER GROUND TELEPHONE		SG	TOP OF SUBGRADE			
T		TELEPHONE PEDESTAL		CS	TOP OF CONCRETE			
COM	COM	COMMUNICATIONS VAULT		AS	TOP OF ASPHALT			
TV-UG	TV-UG	UNDERGROUND TV CABLE		GS	TOP OF GRAVEL			
FO	FO	FIBER OPTIC		INV	INVERT			
PL	PL	OIL & GAS PIPELINE		TC	TOP BACK OF CURB			
W W		WATER MAIN		FL	FLOWLINE			
WS	WS	WATER SERVICE LINE	OR		SIGN	OR		
SWA		SW WATER AUTHORITY PIPELINE			POST / BOLLARD			
		FIRE HYDRANT			CATTLEGUARD			
W.G.V.	W.G.V.	WATER GATE VALVE	X		BARB WIRE FENCE			
W.S.O.	W.S.O.	CURB STOP			CHAIN LINK FENCE			
W	W	WATER METER PIT			VINYL FENCE			
W	W	WATER MANHOLE			WOOD FENCE			
			+		WOVEN WIRE FENCE			
					EVERGREEN TREE			
					DECIDUOUS TREE			

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LEGEND

NORTH INDUSTRIES STREETS AND STORMWATER
DICKINSON, ND

HIGHLANDS ENGINEERING	PROJECT NO.	SECTION NO.	SHEET NO.
	CITY: 202316 / HE: 231223	2	1

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LIST OF NDDOT STANDARD DRAWINGS

Standard No.	Description
D-704-8	Breakaway Systems For Construction Zone Signs - U-Channel Post
D-704-9	Construction Sign Details - Terminal and Guide Signs
D-704-10	Construction Sign Details - Regulatory Signs
D-704-11	Construction Sign Details - Warning Signs
D-701-11A	Construction Sign Details - Warning Signs
D-704-13	Barricade and Channelizing Device Details
D-704-14	Construction Sign Punching and Mounting Details
D-704-15	Road Closure Layouts (Type A)
D-704-22	Construction Truck and Temporary Detour Layouts (Type K, L, & N)
D-704-24	Shoulder Closures and Bridge Painting Layouts (Types R, S, T, & U)
D-704-25	Lane Closures on Urban Streets Layouts (Types V, W, & X)
D-704-26	Miscellaneous Sign Layouts (Types BB, DD, EE, FF, & GG)
D-704-50	Portable Sign Support Assembly
D-714-1	Reinforced Concrete Pipe Culverts and End Sections

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NORTH INDUSTRIES STREETS
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LEGEND

- CEMENT STABILIZED SUBGRADE WITH 4IN GRAVEL SURFACING FOR ROADWAY MAINLINE
- CEMENT STABILIZED SUBGRADE WITH 4IN GRAVEL SURFACING FOR DRIVEWAYS
- CEMENT STABILIZED SUBGRADE WITH 4IN ASPHALT PAVEMENT
- PROPOSED STORM SEWER SYSTEM
- DITCH DRAINAGE IMPROVEMENTS

N
W E
S

0 250' 500'

SCALE: 1" = 250'

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SCOPE OF WORK

NORTH INDUSTRIES STREETS AND STORMWATER
DICKINSON, ND

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HIGHLANDS ENGINEERING	PROJECT NO.	SECTION NO.	SHEET NO.
	CITY: 202316 / HE: 231223	6	1

MISC MISCELLANEOUS REQUIREMENTS

MISC-01 **NDDOT STANDARD SPECIFICATIONS:** Any references to the NDDOT Standard Specifications shall mean the 2024 NDDOT Standard Specifications for Road and Bridge Construction.

MISC-02 **UTILITIES:** Contact "North Dakota One-Call" at (800) 795-0555 or 811 prior to start of any excavation for locations of buried utilities. The locations of any and all underground utilities shown are based upon above ground evidence (including, but not limited to, manholes, inlets, as-built maps, and marks made on the ground by others) and are speculative in nature. There may be underground utilities, whether in service or abandoned, for which there is no above ground evidence or for which the above ground evidence was not observed. Furthermore, the utilities may not be in the exact locations shown on these plans. The Contractor shall verify the locations and elevations of utilities prior to the start of construction. Any damages that may occur from the contractor's failure to exactly locate utilities shall be the responsibility of the Contractor.

MISC-03 **MOBILIZATION:** Include cost of moving all equipment, materials, and personnel to and from the project in the unit price bid for Mobilization. Provide separate costs to mobilize equipment for asphalt paving operations and for all other work items. Engineer will make mobilization payments for these pay items per NDDOT Standard Specifications Table 702-01.

MISC-04 **WORK AREA:** The Work Area for this project includes the public rights-of-way and easements containing the improvements indicated by these Plans.

MISC-05 **WATER**: Provide water as necesary to obtain the proper moisture content for compaction and for dust control. Include in the unit price bid for other items.

DIVISION 01 GENERAL REQUIREMENTS

01 5227-01 **NDPDES PERMIT:** Obtain a North Dakota Pollutant Discharge Elimination System (NDPDES) permit for construction activity from the North Dakota Department of Environmental Quality (NDDEQ) prior to the commencement of any soil disturbing activities on-site. Follow all requirements of the permit during construction until final site stabilization is achieved. Prepare and submit the Notice of Termination for this permit upon final stabilization of site soils.

01 5227-02 **FIBER ROLS 12IN:** Install and maintain fiber rolls through the duration of the project. Fiber rolls are to be removed from the project immediately prior to installation of the erosion control blankets. Engineer will pay for 75% of the fiber rolls upon their acceptable installation. The remaining 25% will be paid upon removal of the fiber rolls from project site.

01 5227-03 **EROSION CONTROL BLANKET:** Erosion Control Blanket shall meet the requirements of NDDOT Type 2 Erosion Control Blanket per NDDOT Standard Specification Section 856.

01 5700-01 **COORDINATION WITH CITY FOR TRAFFIC INTERRUPTIONS:** At least 48 hours prior to interrupting traffic flow or access notify Police (701.456.7762), Ambulance (701.225.1500), Fire Department (701.456.7625), and Dispatch (701.456.7620). Complete the City's Application for Street Closure for Construction form found on the City's web site www.dickinsongov.com, and comply with the required lead time for submitting the application.

01 5700-02 **TRAFFIC CONTROL PHASING:** Submit a traffic control plan in accordance with *Specification 01 5700 Traffic Regulation for Municipal Construction*. The following traffic control and access requirements shall be met during construction as part of this plan:

- Provide work zone signs and traffic control devices using the layouts included in the Plans, Standard Drawings, and/or in accordance with the Manual of Uniform Traffic Control Devices (MUTCD).
- No more than one intersection may be closed at a time.
- Work will only be allowed on one street/avenue at a time.
- Maintain access to the adjacent lots through the duration of construction.
- Phase 1 and Phase 2 traffic control layouts shown by these Plans shall not be in place concurrently.

When the project Work is 25-50% complete, Engineer will pay 50% of Traffic Control. When the project Work is 50-75% complete, Engineer will pay 75% of Traffic Control. When the project Work is 75-100% complete, Engineer will pay 100% of Traffic Control.

02 4205-01 **RELOCATE SIGN OR MAILBOX:** Where indicated by Section 90 of these Plans, remove, salvage all materials, and relocate existing signs or mailboxes to a location to be determined by the Engineer in the field that is just outside of the proposed roadway or driveway.

02 4205-02 **REMOVE BITUMINOUS SURFACING:** Haul bituminous pavement removed from the site during normal business hours, unless otherwise permitted, to the Baler Building site located at 3389 Energy Drive and/or to the landfill site located at 3752 Lehigh Road as directed by the City, and stockpile in designated location. The City Landfill normal hours of operation are Monday thru Friday from 7:00 am MT to 4:30 pm MT and Saturday from 8:00 am MT to 12:00 pm MT. Unless otherwise approved by the City, no commercial disposal, including removed pavement, is allowed Monday thru Friday after 3:30 pm MT or on Saturdays. Removed material becomes the property of the City once stockpiled. Contact Aaron Praus during normal business hours (701.456.7979) a minimum of one week prior to delivery to coordinate stockpiling and to ensure proper scale tickets are produced for this Work if the City's scale is to be used for producing the necessary weight tickets for establishing pay quantities. Include this work in the contract unit price for "Remove Bituminous Surfacing".

02 4205-03 **REMOVE PIPE ALL TYPES AND SIZES:** Where indicated by Section 40 of these Plans, remove existing storm sewer pipes in their entirety and dispose of off-site.

02 4205-04 **REMOVAL OF CATCH BASIN:** Where indicated by Section 40 of these Plans, remove in its entirety and dispose of off-site the existing corrugated metal storm sewer catch basin and grate.

DIVISION 02 EXISTING CONDITIONS

02 3010-01 **SUB-SURFACE CONDITIONS:** Geotechnical evaluation was completed by the City for this project. Consult the full geotechnical report completed by Braun Intertec Corporation dated October 18, 2024 with Project No. B2406649.07 for the complete findings and summary from this geotechnical exploration. This report shall be made available by the Engineer upon request.

DIVISION 31 EARTHWORK

31 1211-01 **REMOVE & REPLACE LANDSCAPING:** Where indicated by Section 77 of these Plans, remove and salvage the existing landscape rock and edging as necessary to install the proposed storm sewer system. Upon completion of the storm sewer system, replace the salvaged landscape edging and landscape rock over NDDOT Type S1 geotextile fabric. Engineer will pay for 25% of bid price upon completion of the removals. The remaining 75% will be paid upon acceptable replacement of the landscape products.

31 2200-01 **TOPSOIL**: Strip and salvage topsoil through its full depth in areas to be graded. Upon completion of grading operations for an area, immediately commence the replacement of topsoil. Engineer will pay for 25% of bid price upon completion of the removals. The remaining 75% will be paid upon acceptable replacement of the topsoil.

31 2316-01 **COMMON EXCAVATION-WASTE**: Complete grading of roadways and ditches as shown by Sections 30 and 90 of these Plans. Remove and properly dispose of excavated material off-site.

31 2323-01 **FILL:** All backfill shall meet the compaction requirements specified for soils below exterior slabs and pavements. Make the following additional changes to this specification section:

- Add the following to the start of Section 32 2323 3.5 B.:
  B. The City will retain the Engineer to...
- Add the following to the start of Section 32 2323 3.5 C.:
  C. The City will retain the Engineer to...

DIVISION 32 EXTERIOR IMPROVEMENTS

32 1207-01 **AGGREGATE BASE 4IN:** Aggregate base, where indicated by these Plans, shall be NDDOT Class 5 aggregate provided, hauled, and placed by the Contractor.

32 1207-02 **GRAVEL SURFACING 4IN:** Gravel surfacing material is to be provided by the City of Dickinson from the Baler Building site located at 3389 Energy Drive and/or the landfill site located at 3752 Lehigh Road as indicated by the City. Obtain this material during normal business hours, unless otherwise permitted by the City. Normal hours of operation are Monday thru Friday from 7:00 am MT to 4:30 pm MT and Saturday from 8:00 am MT to 12:00 pm MT. Unless otherwise approved by the City, no loader will be available Monday thru Friday after 3:30 pm MT or on Saturdays. Provide the trucks and staff necessary to haul this material from these loading locations to the project site. Stage trucks to prevent idle times in excess of 15 minutes for the City loading operations. Loading delays may occur if trucks are not properly staged for the City to continue loading operations as indicated. Contact Aaron Praus during normal business hours (701.456.7979) a minimum of one week prior to delivery to coordinate stockpiling and to ensure proper scale tickets are produced for this Work if the City's scale is to be used for producing the necessary weight tickets for establishing pay quantities. Place and compact this material on the stabilized roadways as indicated by the Contract Documents.

32 1207-03 **COMPACTION OF AGGREGATE MATERIALS:** Make the following changes to Specification Section 32 1207 Aggregate materials:

- Remove Sections 32 1207 3.5 B and 3.5 C.
- Add the following section after Section 32 1207 3.5 F.:
  F. Compact aggregate surfacing material until the surface is tightly bound, shows no rutting, and no displacement occurs under the roller operation.

32 1210-01 **CONCRETE PAVING:** Make the following changes to this specification section:

- In Section 32 1210 2.2 F.2.a., replace "ASTM D-1190" with "ASTM-3390".
- In Section 32 1210 2.3 A.2, replace "Entrained air content shall be between 4% and 7%" with "Entrained air content shall be between 5% and 8%".
- Replace the first sentence of Section 32 1210 3.16 A. with the following:
  A. The City will retain the Engineer to take a minimum of 5 cylinder samples.
- Add the following sentence to the beginning of Section 32 1210 3.16 B.:
  B. The City will retain the Engineer to perform fresh concrete testing.
- Remove Section 32 1210 3.14 D in its entirety.

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NOTES

NORTH INDUSTRIES STREETS AND STORMWATER
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32 1513-01 HOT ASPHALTIC CONCRETE PAVING: Make the following changes to Specification Section 32 1513 Hot Asphaltic Concrete Paving:

- Add the following sentence to the end of Section 32 1513 2.1 A.:
  A. Use PG 58H-34 Asphalt Cement.
- Replace Section 32 1513 2.2 A. with the following:
  A. Mix Design: Conform to NDDOT Standard Specifications Section 430.04 D. Mix design shall be Superpave FAA 43.
- Replace "NDDOT Standard Specification Section 151.02" in Section 32 1513 3.4 A. with "NDDOT Standard Specification Section 430.02".
- Replace the compaction requirement of "95%" in Section 32 1513 3.4 B. with a compaction requirement of "91%".
- Place material in lifts between 1.5 and 2.5 inches of compacted bituminous material.

32 9360-01 TEMPORARY COVER CROP AND MULCH: Temporary cover crop, if required, shall be oats spread at a rate of 64 pounds of pure live seed per acre covered with grass, hay, or straw mulch. Commence seeding and mulching of completed areas immediately, and, in no case, shall it take more than 14 calendar days to finalize seeding. If slopes are 3:1 or greater, seeding and mulching shall be commenced within 7 calendar days of work being completed in the area. Place temporary cover crop and mulch when permanent erosion control measures cannot be installed in accordance with this note in areas where construction has been completed.

32 9360-02 PERMANENT SEED: Use Type 2 Non-Irrigated Seed Mix.

DIVISION 33 UTILITIES

33 0601-01 CHIMNEY SEAL: Make the following changes to Specification Section 33 0601 Manholes, Cleanouts and Covers:

- Replace Section 33 0601 2.2 D. with the following:
  D. Manhole Chimney Seals: Equal to I / I Barriers by Strike Products..
- Remove the second sentence of 33 0601 3.1 C.
- Replace Section 33 0601 3.2 G. with the following:
  G. Where indicated by Section 90 of the Plans, install chimney seals per the Manufacturer's recommendations.

33 0601-02 ADJUST GATE VALVE: Include all labor, equipment, and materials needed to adjust previously installed gate valves boxes; to provide, install, and adjust tracer wire boxes; and to construct concrete collars as shown by the appropriate details in Section 20 of the Plans in the unit price bid for "Adjust Gate Valve Box". If valve boxes are located within gravel areas use the detail for valve box adjustments in gravel, and if valve boxes are located in asphalt pavement, use the detail for valve box adjustments in asphalt.

33 0601-03 ADJUST MANHOLE: Remove without damage and salvage existing manhole frames and grates. Remove and salvage existing adjusting rings and clean top of existing manhole structure. Adjust manhole with salvaged and/or new adjusting rings as indicated by the appropriate details in Section 20 of the Plans. If the manhole is located within gravel areas use the detail for manhole adjustments in gravel, and if the manhole is located in asphalt pavement, use the detail for manhole adjustments in asphalt. Include this work in the unit price bid for "Adjust Manhole".

SPEC SPECIFICATION FOR CEMENT-STABILIZED SUBGRADE SOILS

1. General
   1.1 Description. Cement-stabilized subgrade (CSS) soils shall consist of soil/aggregate, portland cement, and water proportioned, mixed, compacted, and cured in accordance with this specification and shall conform to the lines, grades, thicknesses, and typical cross sections shown in the plans.
2. Referenced Documents
   2.1 AASHTO M 85 - Specification for Portland Cement (ASTM C150)
   2.2 AASHTO M 240 - Specification for Blended Hydraulic Cements (ASTM C595)
   2.3 ASTM C1157 - Performance Specification for Hydraulic Cement
   2.4 AASHTO T 134 - Moisture-Density Relations of Soil-Cement Mixtures (ASTM D558)
   2.5 AASHTO T 310 - In-Place Density and Water Content of Soil and Soil-Aggregate by Nuclear Methods (Shallow Depth) (ASTM D6938)
3. Submittals
   3.1 Submittal Requirements - The contractor shall submit the following to the Engineer at least 30 days before start of any production of CSS:
   3.1.1 Certifications - Certifications for portland cement as required by the Engineer.
   3.1.2 Specifications - Manufacturers' data and specifications for equipment, including capacities to be used in mixing and compacting CSS.
4. Materials
   1.1 Soil/Aggregate - Soil/aggregate may consist of (1) any combination of gravel, stone, sand, silt, and clay; (2) miscellaneous material such as caliche, scoria, slag, sandshell, cinders, and ash; and/or (3) waste material from aggregate production plants. No topsoil or organic content greater than 2% may be present.
   1.2 Portland Cement - All portland cement used shall comply with the latest specifications for portland cement (AASHTO M 85 or ASTM C150) or blended hydraulic cements (AASHTO M 240, ASTM C595, or ASTM C1157).
   1.3 Water - All water used shall be free from substances deleterious to the processing of CSS material.
5. Equipment
   5.1 Descriptions - CSS may be constructed with any machine or combination of machines or equipment that will produce completed CSS material meeting the requirements for gradation, cement and water application, mixing, compacting, finishing, and curing as provided in this specification.
   5.2 Mixing Methods - Mixing shall be accomplished in place using a single-shaft reclaimer machine. Agricultural disks, graders, or other scarifying equipment may be used to initially blend the cement into the soil/aggregate material but should not be used for final mixing.
   5.3 Cement Proportioning - The cement spreader used for in-place mixing shall be capable of uniformly distributing the cement at the specified rate. Cement may be added in dry or slurry form. If applied in slurry form, the slurry mixer and spreading equipment shall be capable of completely dispersing the cement and water and maintaining a uniform, consistent slurry without separation throughout the slurry placement.
   5.4 Application of Water - Water may be applied through the mixer or with water trucks equipped with pressure-spray bars.
   5.5 Compaction - The processed material shall be compacted with one or a combination of the following: tamping or grid roller, pneumatic tire roller, steel-wheel roller, vibratory roller, or vibrating-plate compactor.
6. Construction Requirements
   6.1 General
   6.1.1 Preparation - Before CSS processing begins, the area to be mixed shall be graded and shaped to the lines and grades shown in the plans or as directed by the Engineer. Where typical sections indicate that the roadway is to "Match Existing Grades", complete minor grading operations to correct existing minor surface irregularities and to create consistent lane cross-slopes with the in-place material prior commencing stabilization operations. During this process, notify Engineer of any unsuitable material encountered that many not be stabilized using CSS. Engineer will provide direction on how to proceed.
   6.1.2 Mixing - CSS material shall not be mixed when the soil/aggregate is frozen or when the air temperature is below 40°F (4°C).
   6.2 Processing
   6.2.1 Preparation - The surface of the soil/aggregate to be processed shall be graded to an elevation such that, when the soil/aggregate is mixed with cement and water and recompacted to the required density, the final elevation will be as shown in the plans or as directed by the Engineer. The material in place and the surface conditions shall be approved by the Engineer before the next phase of construction is begun.
   6.2.2 Application of Cement - The specified quantity of cement shall be applied uniformly in a manner that minimizes dust, runoff, and ponding and that is satisfactory to the Engineer. For application of cement in slurry form, initial scoring of the surface shall be performed and soil berms installed to provide a method to uniformly distribute the slurry over the material to be processed without excessive runoff or ponding.
   6.2.3 Mixing - Mixing shall begin within 30 minutes after the cement has been spread and shall continue until a uniform mixture is produced. The final mixture shall be pulverized such that 100% passes the 1½ in. (38 mm) sieve and at least 60% passes the No. 4 (4.75 mm) sieve, exclusive of any gravel or stone retained on the No. 4 (4.75 mm) sieve. The final pulverization test shall be conducted at the conclusion of mixing operations. Mixing shall continue until the product is uniform in color, meets gradation requirements, and is at a moisture content that allows compaction to the required density. The entire operation of cement spreading, water application, and mixing shall result in a uniform soil/aggregate, cement, and water mixture for the full design depth and width.
   6.3 Compaction - CSS material shall be uniformly compacted to a minimum of 95% of maximum dry density based on a moving average of five consecutive tests with no individual test showing a density below 93%. The field density of compacted CSS material shall be determined by the nuclear method in the direct transmission mode (AASHTO T 310 or ASTM D6938). Optimum moisture content and maximum dry density shall be determined prior to the start of construction and in the field prior to and during construction by a moisture-density test (AASHTO T 134 or ASTM D558).
   6.4 Finishing and Curing - As compaction nears completion, the surface of the CSS shall be shaped to the specified lines, grades, and cross sections. Compaction shall then continue until uniform and adequate density is obtained. Compaction and finishing shall be performed in such a manner as to produce a dense surface free of compaction planes, cracks, ridges, or loose material. All finishing operations shall be completed within four hours from the start of mixing. Finished portions of CSS that are traveled on by equipment used in the construction of an adjoining section shall be protected in such a manner as to prevent the equipment from damaging completed work.
   6.5 Traffic - Completed portions of CSS can be opened immediately to construction equipment provided any curing operations are not impacted.
   6.6 Covering - Subsequent subbase and base layers can be placed at any time after finishing is completed, as long as the CSS is sufficiently stable to support the required construction equipment without permanent distortion or marring of the surface.
   6.7 Maintenance - The contractor shall maintain the CSS material in good condition until all CSS treatment work is completed and accepted. Such maintenance shall be performed by the contractor at their own expense. Maintenance shall include immediate repairs of any defects in the CSS that may become apparent. If it is necessary to replace any processed material, the replacement shall be for the full depth, with vertical cuts, using fresh CSS material.
7. Inspection and Testing
   7.1 Description - The Engineer, with the assistance and cooperation of the contractor, shall perform any inspections and tests deemed necessary to ensure the conformance of the work to the contract documents. These inspections and tests may include, but shall not be limited to, the following: (1) Obtaining test samples of the CSS material and its individual components at all stages of processing and after processing is completed; or (2) Observing the operation of all equipment used to perform the work. Only those materials, machines, and methods meeting the requirements of the contract documents shall be used unless otherwise approved by the Engineer.
   7.2 Standards - All testing of processed material or its individual components, unless otherwise noted specifically in the contract documents, shall be in accordance with the latest applicable AASHTO or ASTM specifications in effect as of the date of advertisement for bids on the project.
8. Measurement and Payment
   8.1 Measurement - The materials yielded by or involved in CSS construction shall be measured as follows: (1) In square yards of completed and accepted CSS material as determined by the specified lines, grades, and cross sections shown in the plans; and (2) In tons of cement incorporated into the CSS material as indicated by weight tickets provided by the Contractor. Weights must be established by a certified scale.
   8.2 Payment. This work shall be paid for at the contract unit price per square yard of completed and accepted CSS material and at the contract unit price per ton of cement furnished, multiplied by the quantities obtained in accordance with Section 8.1. Such payment shall constitute full reimbursement for all work necessary to construct the CSS material, including watering, curing, inspection and testing, and all other incidental operations.

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NORTH INDUSTRIES STREETS AND STORMWATER
DICKINSON, ND

HIGHLANDS ENGINEERING	PROJECT NO.	SECTION NO.	SHEET NO.
	CITY: 202316 / HE: 231223	8	1

NO.	DESCRIPTION	UNITS	PLAN QTY.
1	CONTRACT BOND	LSUM	1
2	MOBILIZATION - ASPHALT PAVING	LSUM	1
3	MOBILIZATION - ALL OTHER ITEMS	LSUM	1
4	TRAFFIC CONTROL	LSUM	1
5	FIBER ROLLS 12IN	LF	132
6	TEMPORARY COVER CROP & MULCH	SY	1,463
7	PERMANENT SEED	SY	1,991
8	EROSION CONTROL BLANKET	SY	1,463
9	REMOVE & REPLACE LANDSCAPING	LSUM	1
10	RELOCATE SIGN OR MAILBOX	EA	4
11	REMOVE BITUMINOUS SURFACING	TON	544
12	REMOVE PIPE ALL TYPES AND SIZES	LF	178
13	REMOVAL OF CATCH BASIN	EA	1
14	COMMON EXCAVATION-WASTE	CY	1,946
15	TOPSOIL	CY	311
16	STORM SEWER CONNECTION	EA	1
17	STORM SEWER INLET-TYPE 1	EA	2
18	STORM SEWER MANHOLE-SHALLOW	EA	1
19	PIPE CONDUIT 12IN-STORM DRAIN	LF	65
20	PIPE CONDUIT 15IN-STORM DRAIN	LF	57
21	PIPE CONDUIT 18N-STORM DRAIN	LF	130
22	RCP END SECTION 15IN	EA	1
23	RCP END SECTION 18IN	EA	2
24	CMP CULVERT 18N	LF	66
25	CMP END SECTION 18IN	EA	2
26	CEMENT STABILIZATION 8IN - MAINLINE	SY	20,797
27	CEMENT STABILIZATION 8IN - DRIVEWAY	SY	3,296
28	PORTLAND CEMENT	TON	679
29	AGGREGATE BASE 4IN	TON	1,174
30	GRAVEL SURFACING 4IN	TON	5,019
31	ASPHALT PAVEMENT 4IN	TON	1242
32	ADJUST GATE VALVE	EA	20
33	ADJUST MANHOLE	EA	19
34	CHIMNEY SEAL	EA	2

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ESTIMATE OF QUANTITIES

NORTH INDUSTRIES STREETS AND STORMWATER
DICKINSON, ND

BASIS OF ESTIMATE

REMOVAL OF BITUMINOUS SURFACING

	A	B (SEE SEC. 40)	C (A/36) x B	D	PAY QTY C x D
Pay Item	Depth (IN)	Area (SY)	Volume (CY)	Unit Weight (TON/CY)	Subtotal (TON)
Removal of Bituminous Surfacing	5	1,957	271.8	2	544

COMMON EXCAVATION - WASTE AND TOPSOIL

	A	B	C *	D *	E *	PAY QTY A - (B - C - D - E)	F	G	PAY QTY F x (G/12) / 27
	EXCAVATION	FILL	REMOVED BITUMINOUS PAVEMENT	PROPOSED AGGREGATE BASE	PROPOSED ASPHALT PAVEMENT	COMMON EXCAVATION-WASTE	TOPSOILED AREA WITHIN GRADING LIMITS	TOPSOIL DEPTH	TOPSOIL
Location	Existing Ground Surface to Finish Ground Surface (CY)	Existing Ground Surface to Finish Ground Surface (CY)	Volume [See Table Above] (CY)	Volume [See Table Below] (CY)	Volume [See Table Below] (CY)	Subtotal (TON)	Area (SF)	Depth (IN)	Subtotal (CY)
43rd Street W Ditch Grading from 3rd Ave W to 1st Ave W	258	0	0	0	0	258	9,717	6	180
43rd Street W Ditch Grading from 1st Ave W to Sims St	45	0	0	0	0	45	1,753	6	32
1st Ave W Ditch Grading north of 43rd Street W	43	0	0	0	0	43	1,262	6	23
3rd Ave W Roadway Grading	206	339	544	597	592	1,600	4,046	6	75
TOTAL						1,946			311

*** Assumed quantities in these columns shall be replaced with final pay quantity totals for these items to determine the final Common Excavation-Waste quantity. Pay Quantities for these columns that are measured by weight shall be converted to volume for use in this table using a unit weight of 2 Ton/CY for existing and proposed bituminous pavement and 1.875 Ton/CY for aggregates.**

AGGREGATE BASE COURSE

	A	B	C = (A / 36) x B	D	E = C * D
Location	Base Depth (IN)	Area (SY)	Volume (CY)	Unit Weight (TON/CY)	Subtotal
Base for 3rd Ave W Mainline Asphalt Pavement	4	5,375	597.2	1.875	1,120
Base for Driveways with Asphalt Pavement	4	258	28.7	1.875	54
TOTAL					1,174

ASPHALT PAVEMENT

	A	B	C = (A / 36) x B	D	E = C * D
Location	Pavement Depth (IN)	Area (SY)	Volume (CY)	Unit Weight (TON/CY)	Subtotal
3rd Ave W Mainline Asphalt Pavement	4	5,332	592.4	2	1,185
Driveways with Asphalt Pavement	4	258	28.7	2	57
TOTAL					1,242

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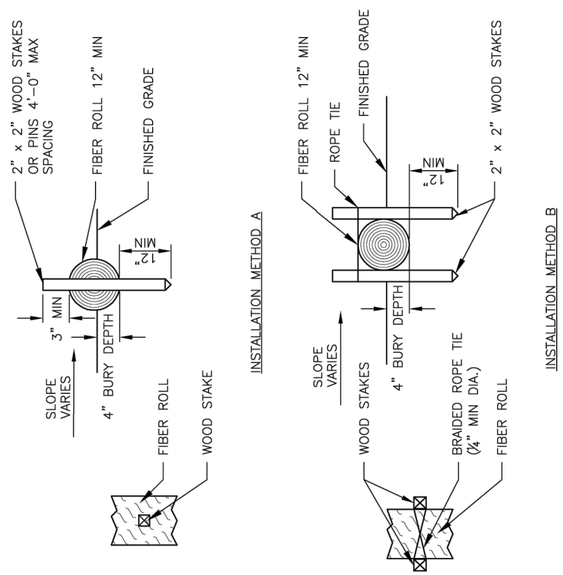
BASIS OF ESTIMATE

NORTH INDUSTRIES STREETS AND STORMWATER
DICKINSON, ND



City Detail No.:	C1.01
Last Revision:	3/2017
Scale:	None

STANDARD DRAWINGS

FIBER ROLL INSTALLATION

DICKINSON

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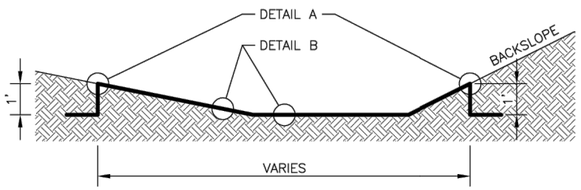
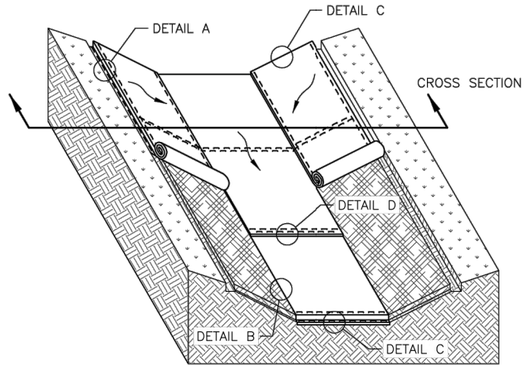
DETAILS

NORTH INDUSTRIES STREETS AND STORMWATER
DICKINSON, ND

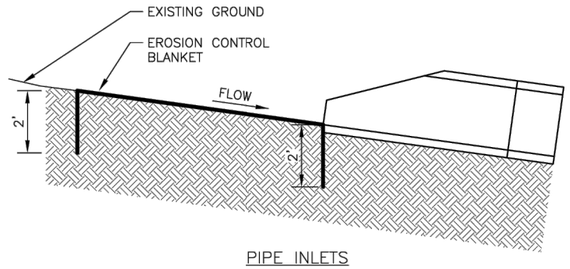
HIGHLANDS ENGINEERING	PROJECT NO.	SECTION NO.	SHEET NO.
	CITY: 202316 / HE: 231223	20	2



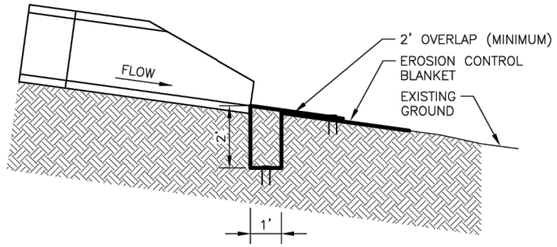
CROSS SECTION



BLANKET LAYOUT

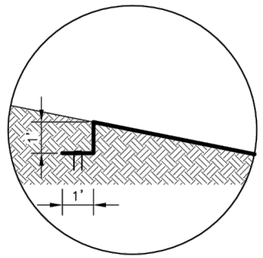


PIPE INLETS

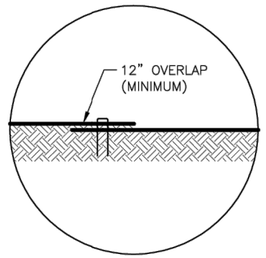


PIPE OUTLETS

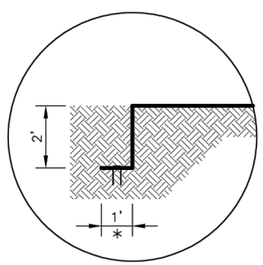
INSTALLATION AT PIPE ENDS



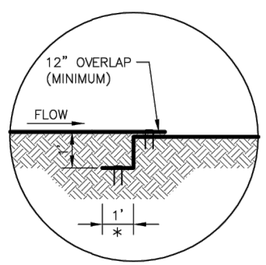
DETAIL A



DETAIL B



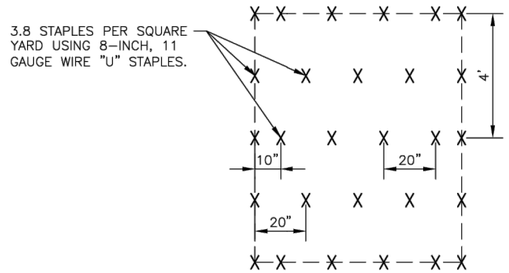
DETAIL C



DETAIL D

* THIS TIE MAY BE PLACED AHEAD OR BACK.

DETAILS



STAPLE PATTERN

NOTES:
1. BEGINNING AND ENDING OF EROSION CONTROL BLANKET AREAS SHALL BE INSTALLED AS SHOWN IN "DETAIL C".
2. EROSION CONTROL BLANKET ENDS SHALL BE ENTRENCHED AND STAPLED TO ELIMINATE UNDERMINING ON SIDE SLOPES.

CHANNEL OR SLOPE INSTALLATION

STANDARD DRAWINGS

EROSION CONTROL BLANKET

City Detail No.: C1.05
Last Revision: 3/2017
Scale: None

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DETAILS

NORTH INDUSTRIES STREETS AND STORMWATER
DICKINSON, ND

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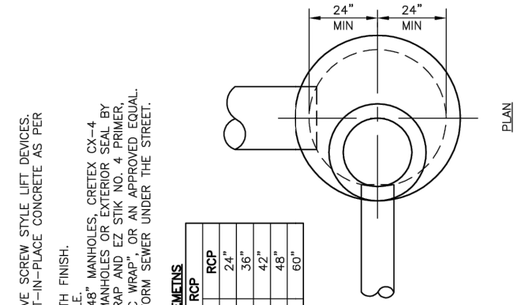
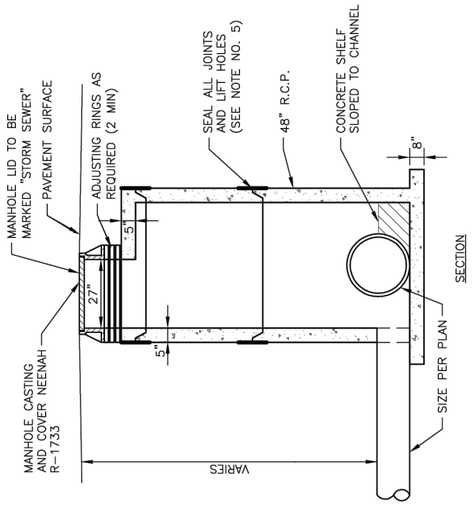
HIGHLANDS ENGINEERING	PROJECT NO.	SECTION NO.	SHEET NO.
	CITY: 202316 / HE: 231223	20	3



NOTES:
1. ALL MANHOLE SECTIONS SHALL HAVE SCREW STYLE LIFT DEVICES.
2. PROVIDE SLOPED FLOOR WITH CAST-IN-PLACE CONCRETE AS PER SPECIFICATIONS.
3. ALL INVERTS SHALL HAVE A SMOOTH FINISH.
4. FOR MANHOLE DIAMETER, SEE TABLE.
5. CRETEX P2 GASKETED JOINT FOR 48" MANHOLES, CRETEX CX-4 JOINT FOR ALL OTHER SIZES OF MANHOLES OR EXTERIOR SEAL BY PRESS-SEAL GASKET CORP. EZ WRAP AND EZ STIK NO. 4 PRIMER, CRETEX SPECIALTY PRODUCTS "MAC WRAP", OR AN APPROVED EQUAL.
6. NO TRACER WIRE REQUIRED ON STORM SEWER UNDER THE STREET.

RECOMMENDED PRECAST SIZE REQUIREMETNS

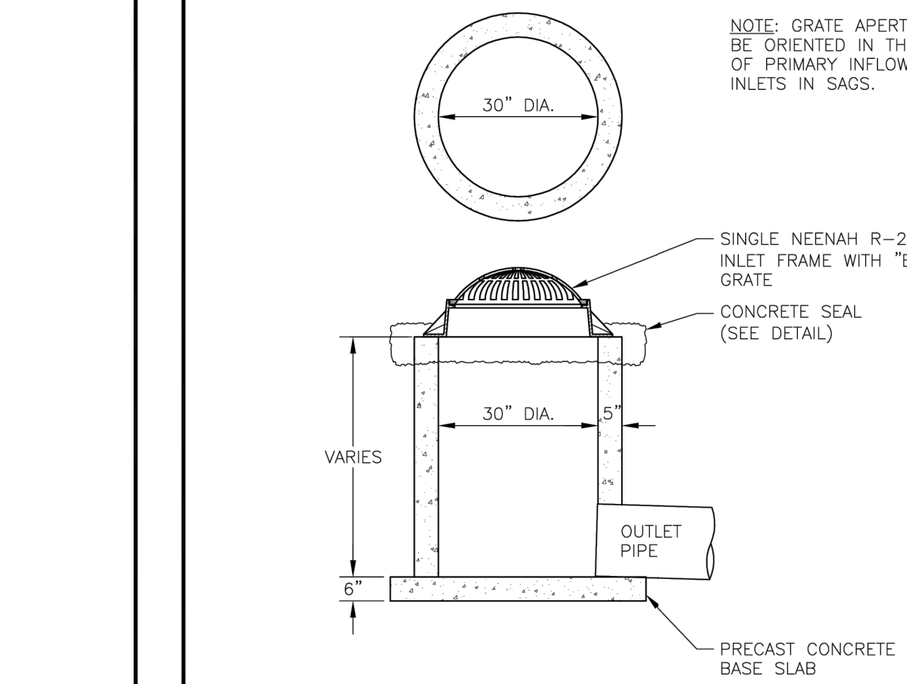
BARREL DIAMETER	MAXIMUM SIZE RCP		
	2 @ 90	2 @ 180	RCP
48"	24"	24"	24"
60"	36"	36"	36"
72"	42"	42"	42"
84"	48"	48"	48"
96"	60"	60"	60"



City Detail No.: C4.02
Last Revision: 3/2017
Scale: None

STANDARD DRAWINGS

STORM SEWER MANHOLE - SHALLOW



NOTE: GRATE APERTURES SHALL BE ORIENTED IN THE DIRECTION OF PRIMARY INFLOW FOR INLETS IN SAGS.

City Detail No.: C4.03
Last Revision: 3/2017
Scale: None

STANDARD DRAWINGS

STORM SEWER INLET - TYPE 1

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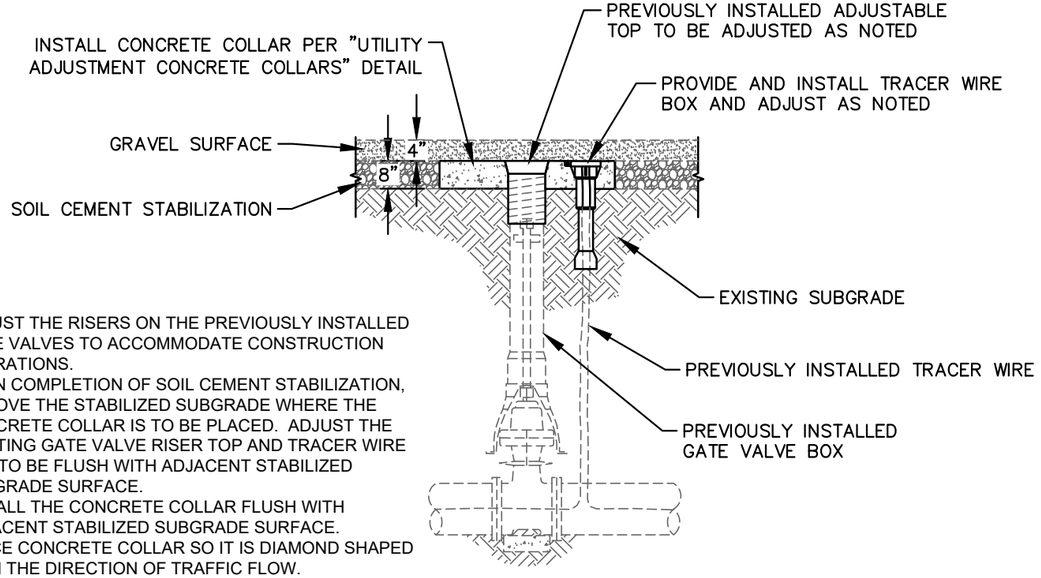
DETAILS

NORTH INDUSTRIES STREETS AND STORMWATER
DICKINSON, ND

HIGHLANDS ENGINEERING	PROJECT NO.	SECTION NO.	SHEET NO.
	CITY: 202316 / HE: 231223	20	4

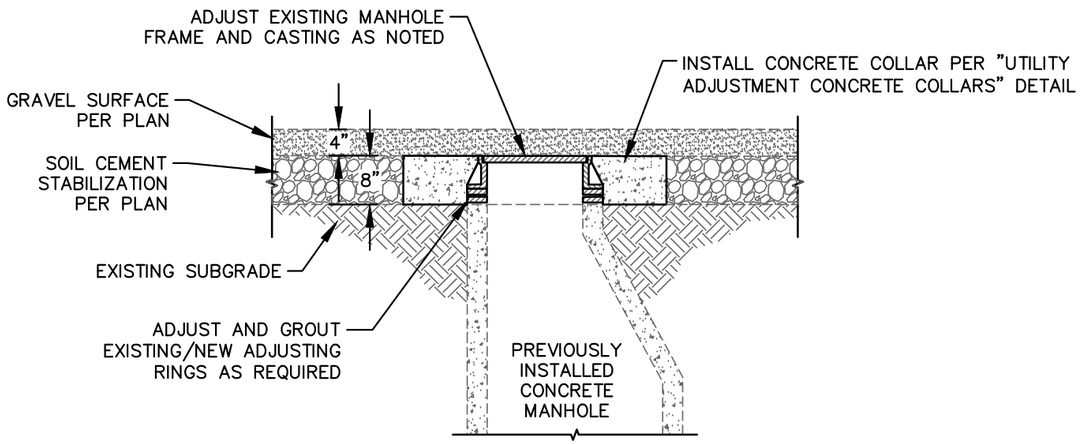


NOTES

1. ADJUST THE RISERS ON THE PREVIOUSLY INSTALLED GATE VALVES TO ACCOMMODATE CONSTRUCTION OPERATIONS.
2. UPON COMPLETION OF SOIL CEMENT STABILIZATION, REMOVE THE STABILIZED SUBGRADE WHERE THE CONCRETE COLLAR IS TO BE PLACED. ADJUST THE EXISTING GATE VALVE RISER TOP AND TRACER WIRE BOX TO BE FLUSH WITH ADJACENT STABILIZED SUBGRADE SURFACE.
3. INSTALL THE CONCRETE COLLAR FLUSH WITH ADJACENT STABILIZED SUBGRADE SURFACE.
4. PLACE CONCRETE COLLAR SO IT IS DIAMOND SHAPED WITH THE DIRECTION OF TRAFFIC FLOW.

GATE VALVE BOX ADJUSTMENT IN GRAVEL

NOT TO SCALE

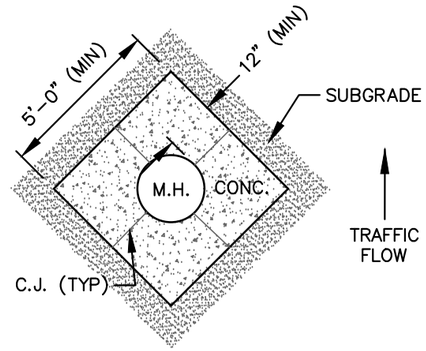


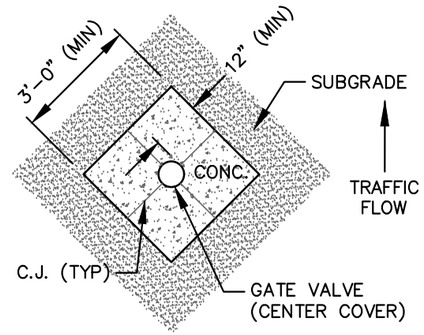
NOTES

1. REMOVE AND SALVAGE EXISTING MANHOLE CASTING AND COVER TO ACCOMMODATE CONSTRUCTION OPERATIONS.
2. UPON COMPLETION OF SOIL CEMENT STABILIZATION, REMOVE THE STABILIZED SUBGRADE WHERE THE CONCRETE COLLAR IS TO BE PLACED.
3. RESET THE EXISTING MANHOLE CASTING AND ADJUST BY USING THE EXISTING CONCRETE ADJUSTING RINGS AND GROUT. METAL ADJUSTING RINGS WILL NOT BE ALLOWED. NO WOOD SHIMS ARE ALLOWED TO SPACE ADJUSTING RINGS.
4. INSTALL THE MANHOLE CASTING WITH COVER FLUSH WITH THE ADJACENT STABILIZED SUBGRADE SURFACE. INSTALL THE CONCRETE COLLAR FLUSH WITH ADJACENT STABILIZED SUBGRADE SURFACE.
3. PLACE CONCRETE COLLAR SO IT IS DIAMOND SHAPED WITH THE DIRECTION OF TRAFFIC FLOW.

MANHOLE ADJUSTMENT IN GRAVEL

NOT TO SCALE





UTILITY ADJUSTMENT CONCRETE COLLARS IN GRAVEL

NOT TO SCALE

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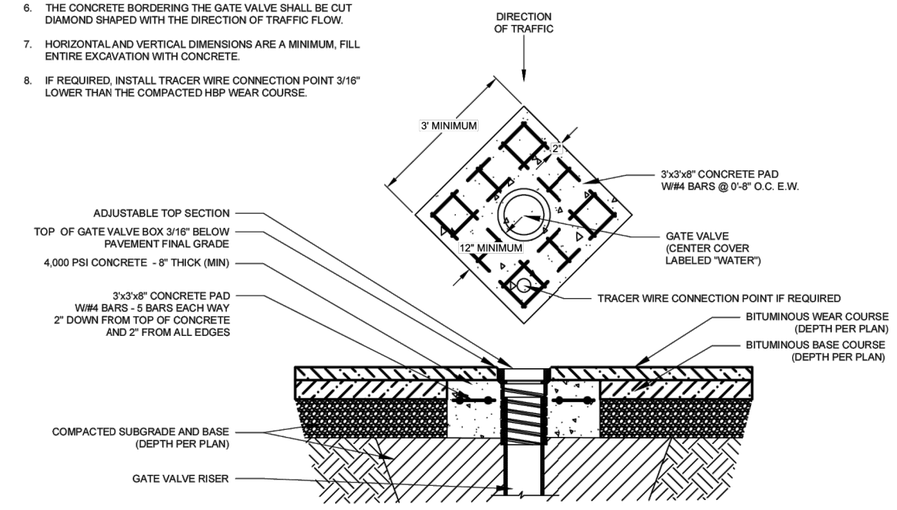
DETAILS

NORTH INDUSTRIES STREETS AND STORMWATER
DICKINSON, ND

HIGHLANDS ENGINEERING	PROJECT NO.	SECTION NO.	SHEET NO.
	CITY: 202316 / HE: 231223	20	5

NOTES:

1. UPON COMPLETION OF THE BITUMINOUS BASE COURSE, THE CONTRACTOR SHALL REMOVE THE NEW PAVEMENT AS REQUIRED TO ADJUST THE EXISTING GATE VALVE RISER, NEAT CUT ALL EDGES.
2. INSTALL THE 8" x 3' x 3' CONCRETE SLAB LEVEL WITH THE ADJACENT SURFACE OF BASE COURSE.
3. INSTALL GATE VALVE BOX 3/16" LOWER THAN THE PROPOSED HBP COMPACTED WEAR COURSE SURFACE.
4. GATE VALVE BOX RISERS MAY BE USED IF APPROVED BY THE ENGINEER. NO INTERNAL SCREW OR SLIP TYPE VALVE BOX EXTENSIONS SHALL BE USED.
5. THE GATE VALVE BOX COLLAR SHALL BE 4,000 PSI CONCRETE (MINIMUM 7 DAYS CURE TIME). IF SCHEDULE DOES NOT ALLOW, HIGH EARLY CONCRETE SHALL BE USED (MINIMUM 3 DAYS CURE TIME).
6. THE CONCRETE BORDERING THE GATE VALVE SHALL BE CUT DIAMOND SHAPED WITH THE DIRECTION OF TRAFFIC FLOW.
7. HORIZONTAL AND VERTICAL DIMENSIONS ARE A MINIMUM, FILL ENTIRE EXCAVATION WITH CONCRETE.
8. IF REQUIRED, INSTALL TRACER WIRE CONNECTION POINT 3/16" LOWER THAN THE COMPACTED HBP WEAR COURSE.

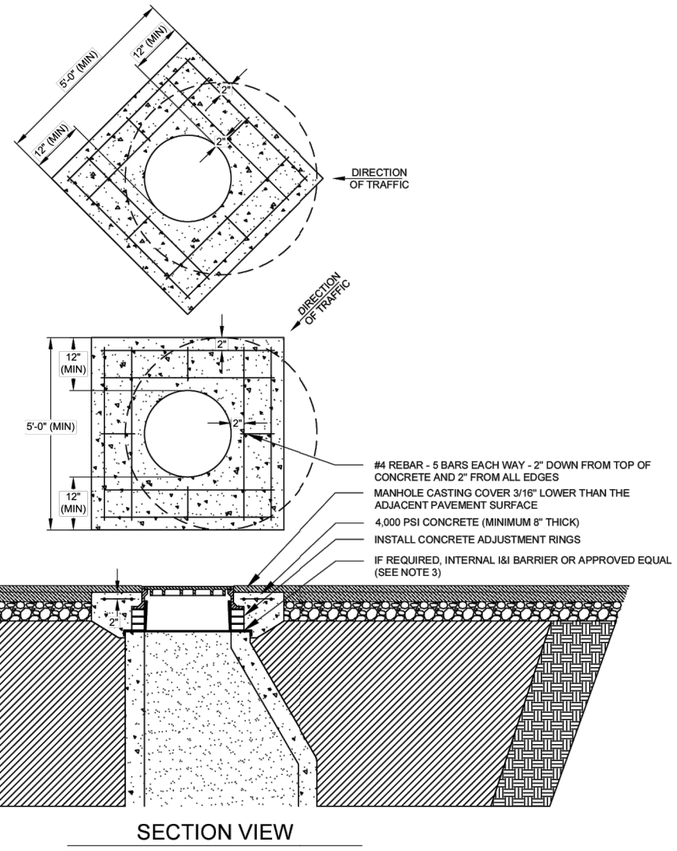


GATE VALVE BOX ADJUSTMENT IN ASPHALT

NOT TO SCALE

NOTES:

1. THE MANHOLE CASTING AND COVER SHALL BE REMOVED AND SALVAGED TO ALLOW FOR PLACEMENT OF BITUMINOUS BASE COURSE.
2. UPON COMPLETION OF THE HBP BITUMINOUS BASE COURSE, THE CONTRACTOR SHALL NEAT CUT AND REMOVE THE PAVEMENT AS REQUIRED TO INSTALL THE MANHOLE CASTING AND COVER FOR PROPER ADJUSTMENT - MINIMUM 8" x 5' x 5'.
3. IF NOTED IN THE PLANS AND/OR SPECIFICATIONS NEW MANHOLES SHALL HAVE AN APPROPRIATELY SIZED I&I BARRIER. THE BARRIER SHALL BE INSTALLED PER MANUFACTURER'S REQUIREMENTS.
4. MANHOLE CASTING SHALL BE ADJUSTED USING PRECAST CONCRETE RINGS (MAXIMUM OF 3 RINGS). GROUT SHALL BE PLACED BETWEEN ALL CONCRETE RINGS. INTERIOR EDGES MUST BE SMOOTH.
5. METAL ADJUSTING RINGS/COLLARS ABOVE MANHOLE CASTING WILL NOT BE ALLOWED.
6. MANHOLE CASTING WITH COVER SHALL BE INSTALLED 3/16" LOWER THAN THE PROPOSED HBP COMPACTED WEAR COURSE SURFACE. CASTING SHALL BE ADJUSTED TO FOLLOW THE GRADE OF THE PAVEMENT.
4. THE MANHOLE COLLAR SHALL BE 4,000 PSI CONCRETE (MINIMUM 7 DAYS CURE TIME). IF SCHEDULE DOES NOT ALLOW, HIGH EARLY CONCRETE SHALL BE USED (MINIMUM 3 DAYS CURE TIME).
5. THE CONCRETE BORDERING THE MANHOLE SHALL BE CUT DIAMOND SHAPED WITH THE DIRECTION OF TRAFFIC FLOW.
6. AT A MINIMUM, EXPOSE TOP 2" OF MANHOLE CONE FOR THE PLACEMENT OF THE CONCRETE COLLAR.
7. TOP OF CONCRETE SHALL MATCH TOP SURFACE OF BITUMINOUS BASE/BINDER COURSE.
8. FILL ENTIRE EXCAVATION WITH CONCRETE.



SECTION VIEW

MANHOLE ADJUSTMENT IN ASPHALT

NOT TO SCALE

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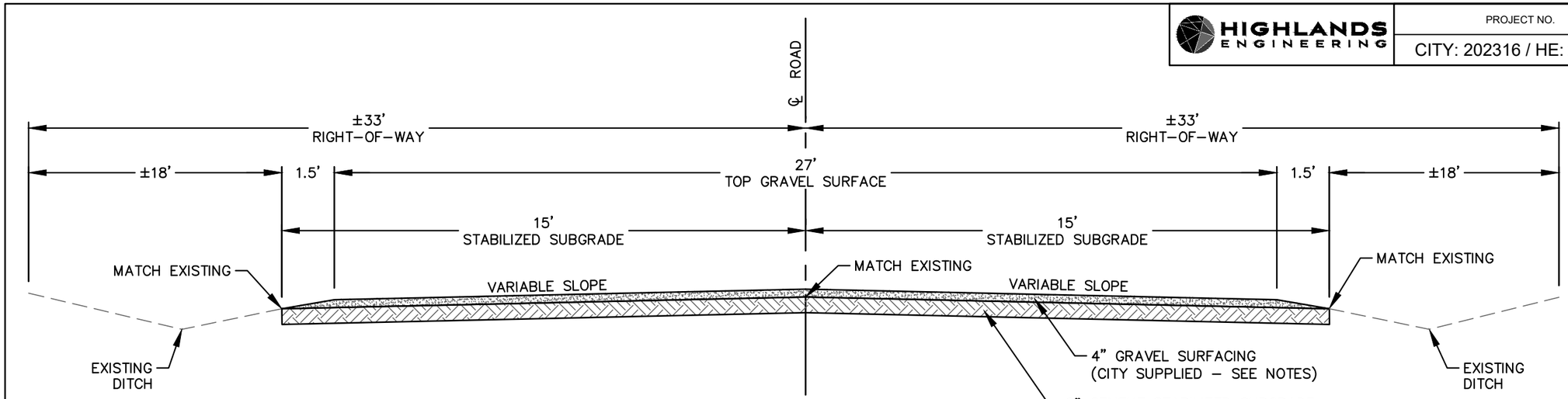
DETAILS

NORTH INDUSTRIES STREETS AND STORMWATER
DICKINSON, ND

HIGHLANDS ENGINEERING	PROJECT NO.	SECTION NO.	SHEET NO.
	CITY: 202316 / HE: 231223	30	1

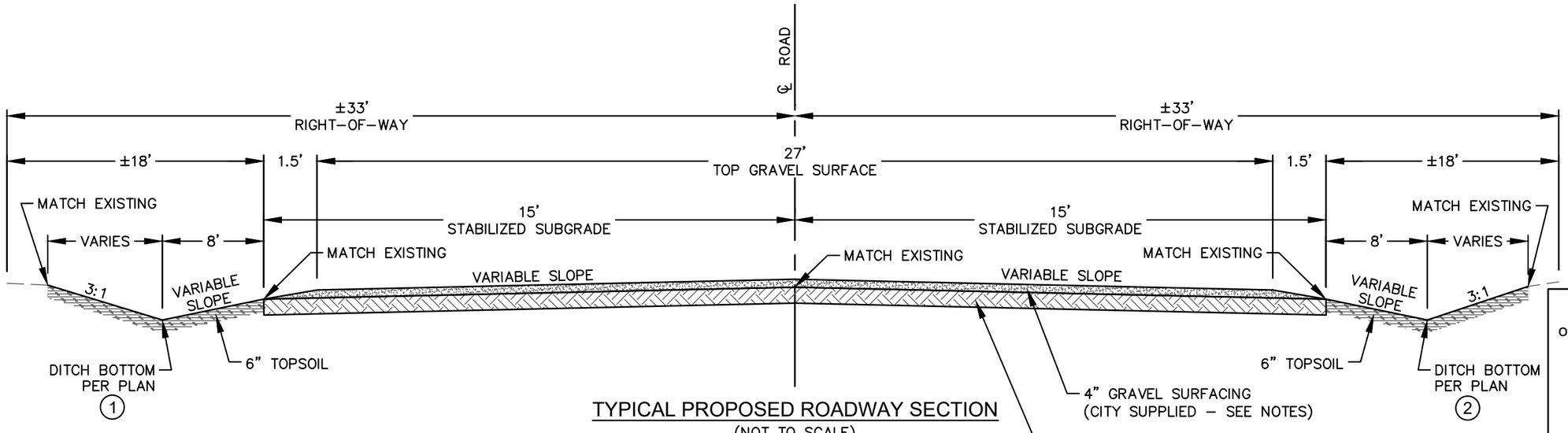


TYPICAL PROPOSED ROADWAY SECTION

(NOT TO SCALE)

ALL ROADS EXCEPT 3RD AVE W

LOCATIONS NOT RECEIVING DITCH IMPROVEMENTS



TYPICAL PROPOSED ROADWAY SECTION

(NOT TO SCALE)

ALL ROADS EXCEPT 3RD AVE W

DITCH IMPROVEMENT AREAS

STA. 112+12 TO 113+16 RT

STA. 400+18 TO 405+89 LT

STA. 406+61 TO 408+05 LT

① PROPOSED DITCH PRESENT ONLY ON THE LEFT:
- STA 400+18 TO 405+89 LT
- STA 406+61 TO 408+05 LT

② PROPOSED DITCH PRESENT ONLY ON THE RIGHT:
- STA 112+12 TO 113+16 RT

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TYPICAL SECTIONS

NORTH INDUSTRIES STREETS AND STORMWATER
DICKINSON, ND

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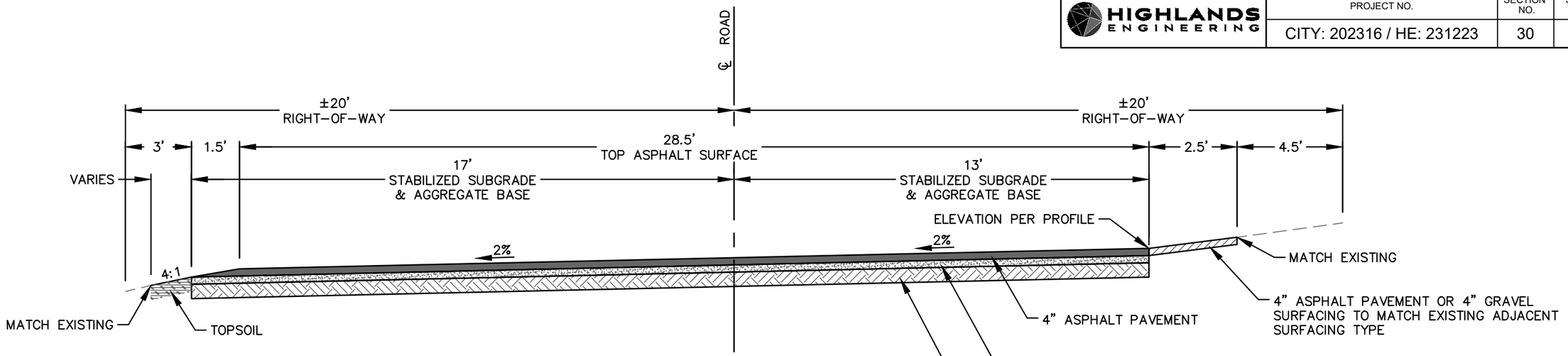
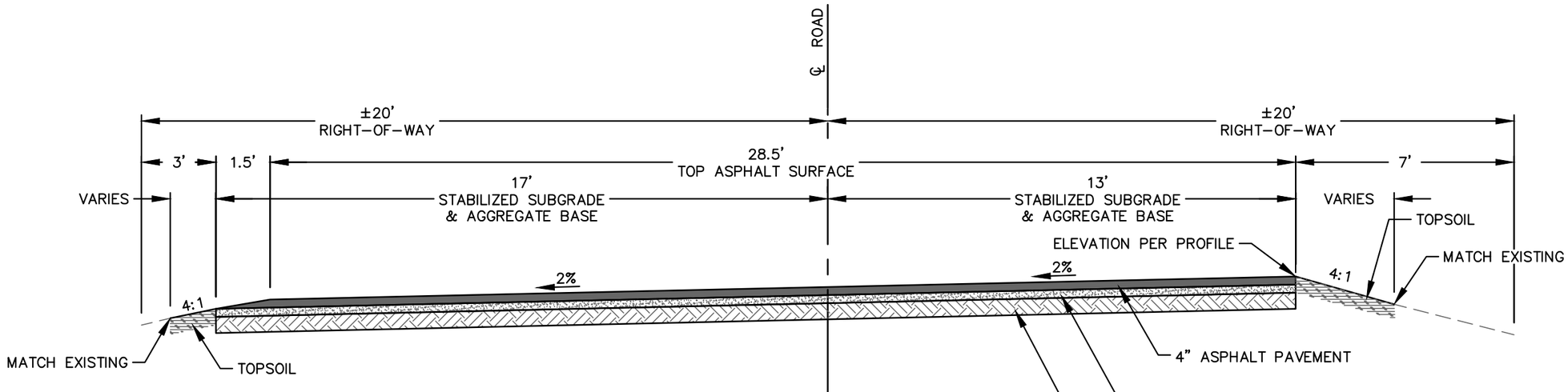
HIGHLANDS ENGINEERING	PROJECT NO.	SECTION NO.	SHEET NO.
	CITY: 202316 / HE: 231223	30	2



TYPICAL PROPOSED ROADWAY SECTION
(NOT TO SCALE)
3RD AVE W FRONTAGE RD
AREAS WITH DRIVEWAYS ADJACENT



TYPICAL PROPOSED ROADWAY SECTION
(NOT TO SCALE)
3RD AVE W FRONTAGE RD
AREAS WITHOUT DRIVEWAYS ADJACENT

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TYPICAL SECTIONS

NORTH INDUSTRIES STREETS
AND STORMWATER
DICKINSON, ND

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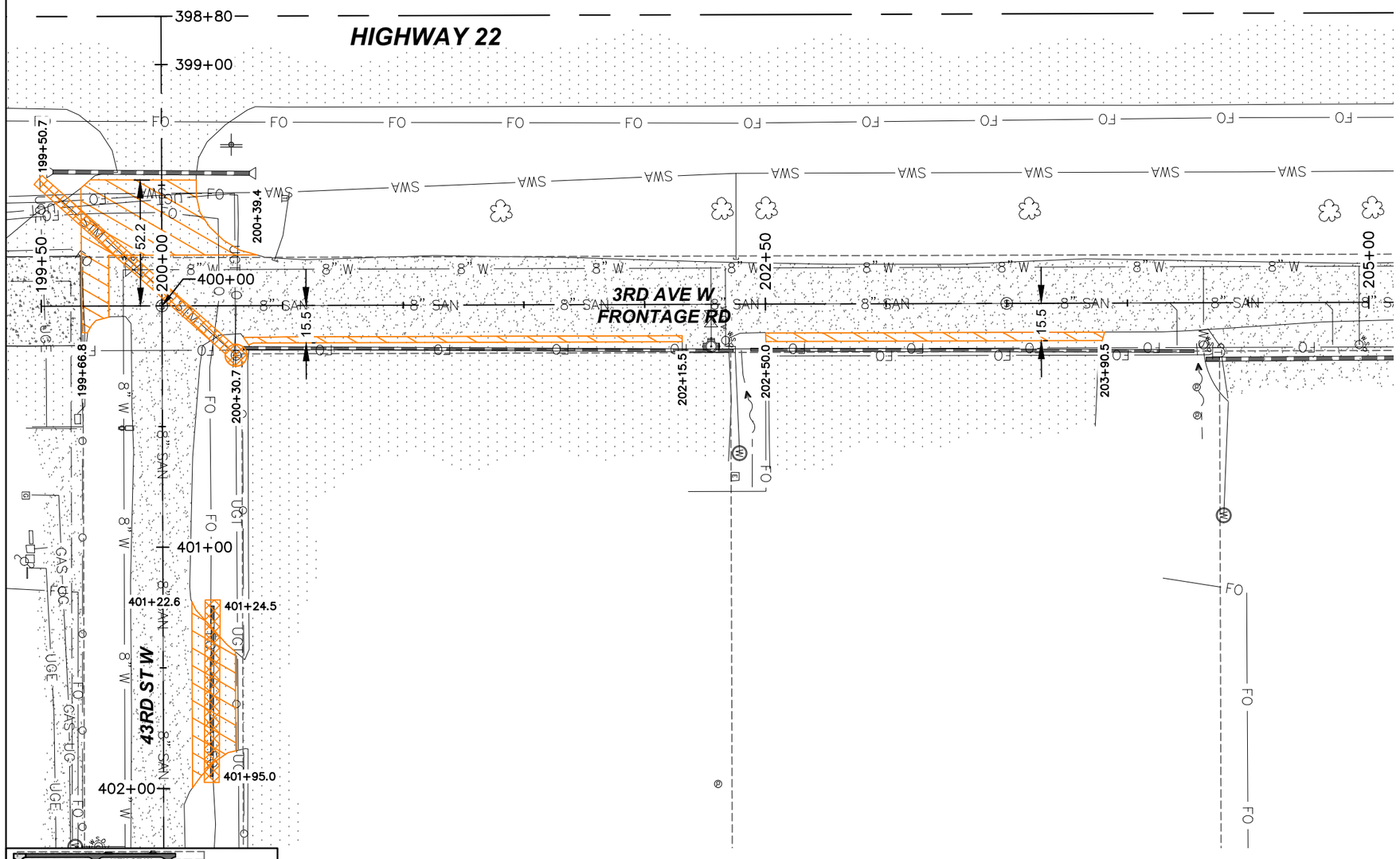
HIGHLANDS ENGINEERING	PROJECT NO.	SECTION NO.	SHEET NO.
	CITY: 202316 / HE: 231223	40	1



LEGEND

QUANTITIES THIS SHEET

REMOVE BITUMINOUS SURFACING

Sta 199+67 to 203+91	325 SY
Sta 401+23 to 402+00	112 SY
	437 SY

REMOVE PIPE ALL TYPES AND SIZES

Sta 199+51 to 200+31	107 LF
Sta 401+25 to 401+95	71 LF
	178 LF

REMOVAL OF CATCH BASIN

Sta 200+31	1 EA

0 50' 100'

SCALE: 1" = 50'

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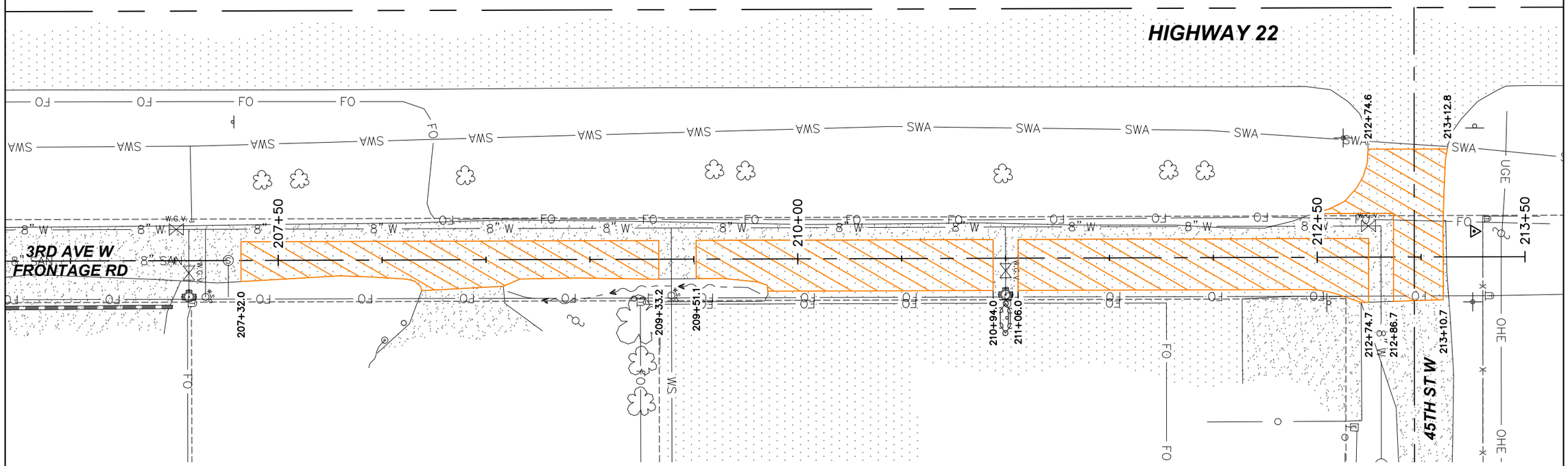
REMOVALS

NORTH INDUSTRIES STREETS AND STORMWATER
DICKINSON, ND

3/10/2025 1:59:16 PM schrank H:\231223\PROJECT CAD\CURRENT\231223_040RM_001_removals.dwg

HIGHLANDS ENGINEERING	PROJECT NO.	SECTION NO.	SHEET NO.
	CITY: 202316 / HE: 231223	40	2

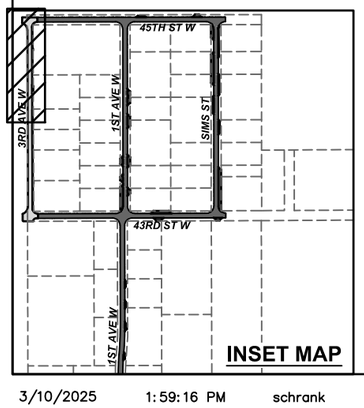


LEGEND

QUANTITIES THIS SHEET

REMOVE BITUMINOUS SURFACING

Sta 207+32 to 213+13	1,520 SY	



0 50' 100'

SCALE: 1" = 50'

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REMOVALS

NORTH INDUSTRIES STREETS AND STORMWATER
DICKINSON, ND

3/10/2025 1:59:16 PM schrank H:\231223\PROJECT CAD\CURRENT\231223_040RM_001_removals.dwg

Inlet No:	IN-D1
Inlet Type:	STORM SEWER INLET - TYPE 1
Station:	112+37.98 - 23.00' RT
Grate Type:	DOMED
Grate Elev:	2549.50
Base Elev:	2547.75
Invert Elev:	2548.00
12IN Conduit (SE)	2548.00

Inlet No:	IN-D2
Inlet Type:	STORM SEWER INLET - TYPE 1
Station:	406+88.06 - 23.00' LT
Grate Type:	DOMED
Grate Elev:	2549.25
Base Elev:	2546.50
Invert Elev:	2546.75
12IN Counduit (NW)	2547.00
15IN Conduit (S)	2546.75

Manhole No:	MH-D1
Station:	400+17.55 - 26.31' LT
Inside Dia.:	48 IN
Rim Elev:	2541.25
Base Elev:	2536.75
Invert Elev:	2537.00
Riser:	3.00
18IN Counduit (E)	2537.50
12IN Counduit (N)	2538.00
18IN Conduit (SW)	2537.00

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INLET & MANHOLE SUMMARY

NORTH INDUSTRIES STREETS AND STORMWATER
DICKINSON, ND

HIGHLANDS ENGINEERING	PROJECT NO.	SECTION NO.	SHEET NO.
	CITY: 202316 / HE: 231223	51	1

Conduit Name	Begin Station / Location	End Station / Location	Pipe Installation (Pay Item)			Allowable Material	Req'd Dia.	Steel Pipe Coating	Steel Pipe Corrug. or Spiral Rib	Steel Pipe Minimum Thickness	End Section	
			Inch	Bid Item	LF		Inch	Type	Inch	Inch	Begin	End
											EA	EA
P-D1	CON-D1	MH-D1	12	PIPE CONDUIT 12IN-STORM DRAIN	8	Type III RCP	12					
P-D2	FE-D2	MH-D1	18	PIPE CONDUIT 18IN-STORM DRAIN	30	Type III RCP	18				FES	
P-D3	MH-D1	FE-D1	18	PIPE CONDUIT 18IN-STORM DRAIN	100	Type III RCP	18					FES
P-D4	IN-D1	IN-D2	12	PIPE CONDUIT 12IN-STORM DRAIN	57	N-12 HDPE Pipe Type III RCP	12					
P-D5	IN-D2	FE-D3	15	PIPE CONDUIT 15IN-STORM DRAIN	57	Type III RCP	15					FES

End Sections: R&R = Remove & Relay
FES = Flared End Section
TES = Travesable End Section

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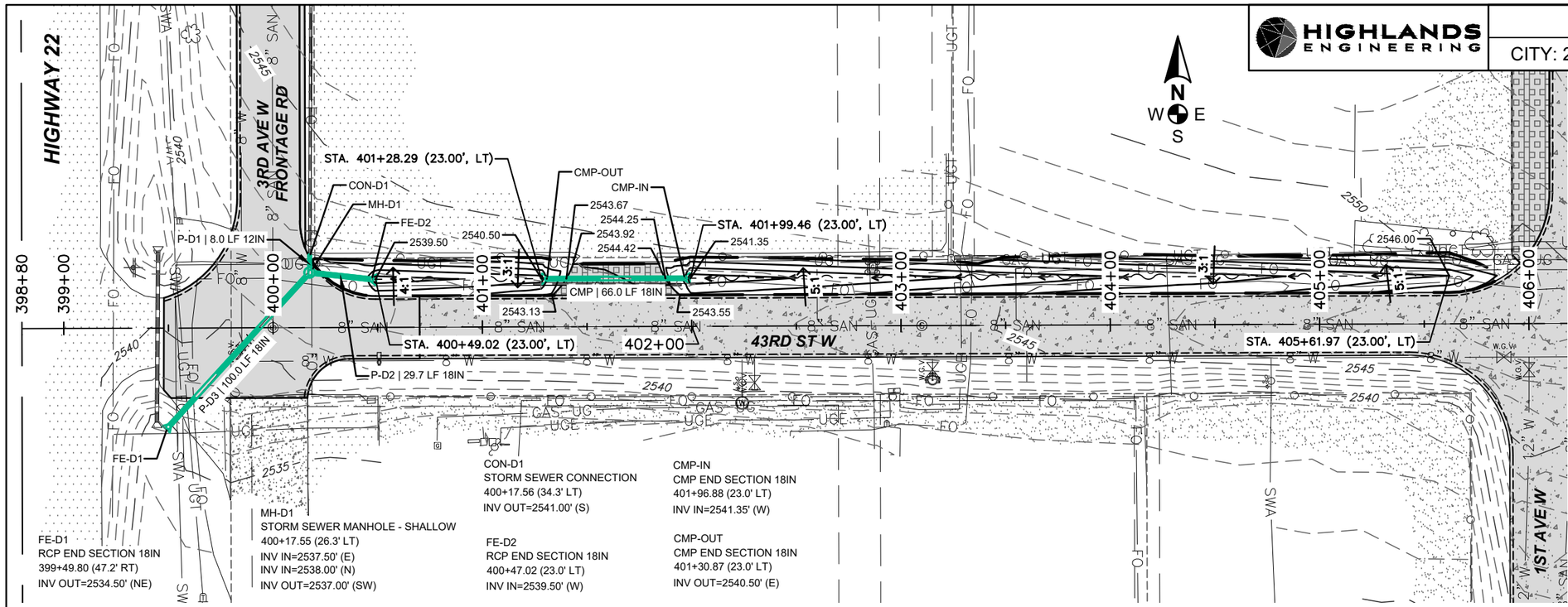
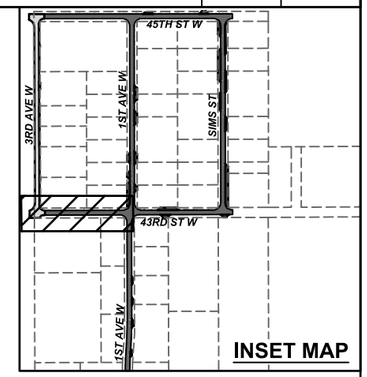
ALLOWABLE PIPE LIST

NORTH INDUSTRIES STREETS AND STORMWATER
DICKINSON, ND

HIGHLANDS ENGINEERING

PROJECT NO.	SECTION NO.	SHEET NO.
CITY: 202316 / HE: 231223	60	1





INSET MAP

FE-D1
RCP END SECTION 18IN
399+49.80 (47.2' RT)
INV OUT=2534.50' (NE)

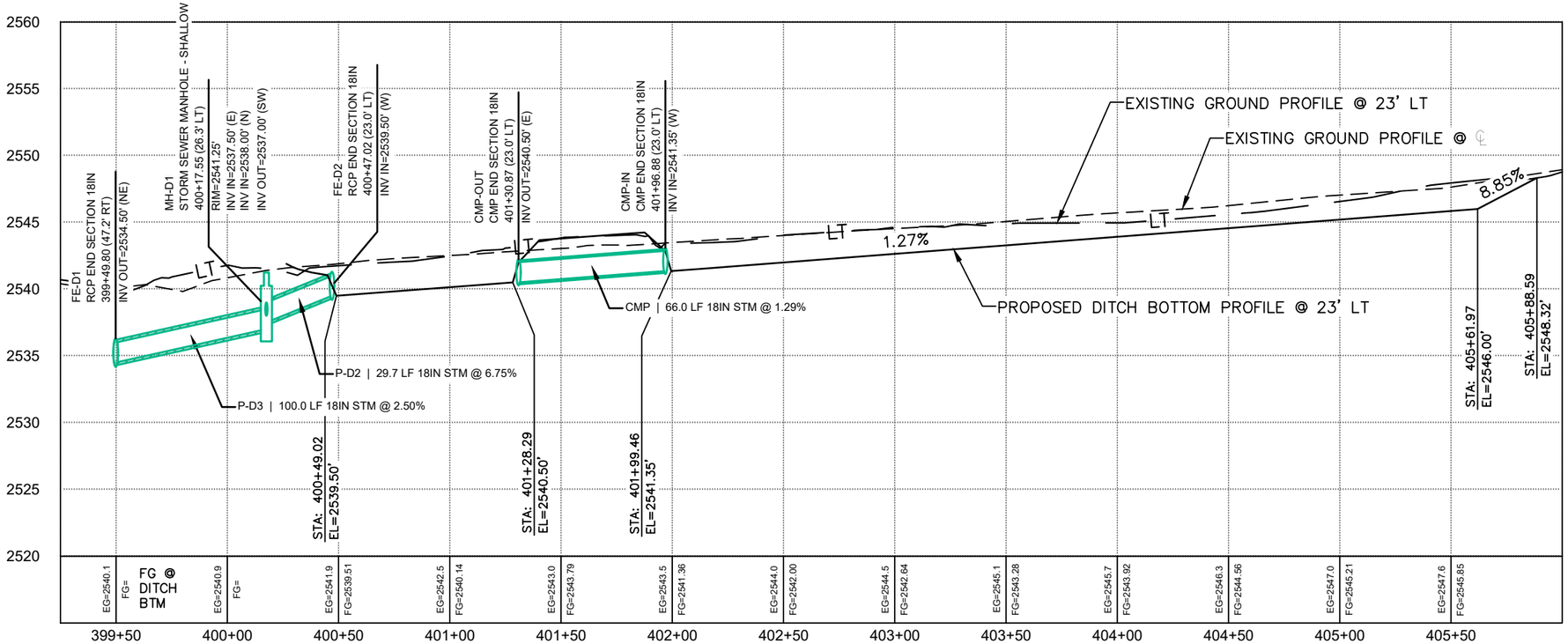
MH-D1
STORM SEWER MANHOLE - SHALLOW
400+17.55 (26.3' LT)
INV IN=2537.50' (E)
INV IN=2538.00' (N)
INV OUT=2537.00' (SW)

CON-D1
STORM SEWER CONNECTION
400+17.56 (34.3' LT)
INV OUT=2541.00' (S)

FE-D2
RCP END SECTION 18IN
400+47.02 (23.0' LT)
INV IN=2539.50' (W)

CMP-IN
CMP END SECTION 18IN
401+96.88 (23.0' LT)
INV IN=2541.35' (W)

CMP-OUT
CMP END SECTION 18IN
401+30.87 (23.0' LT)
INV OUT=2540.50' (E)



SCALE:
HORIZONTAL: 1" = 60'
VERTICAL: 1" = 10'

0 5 10 60 120

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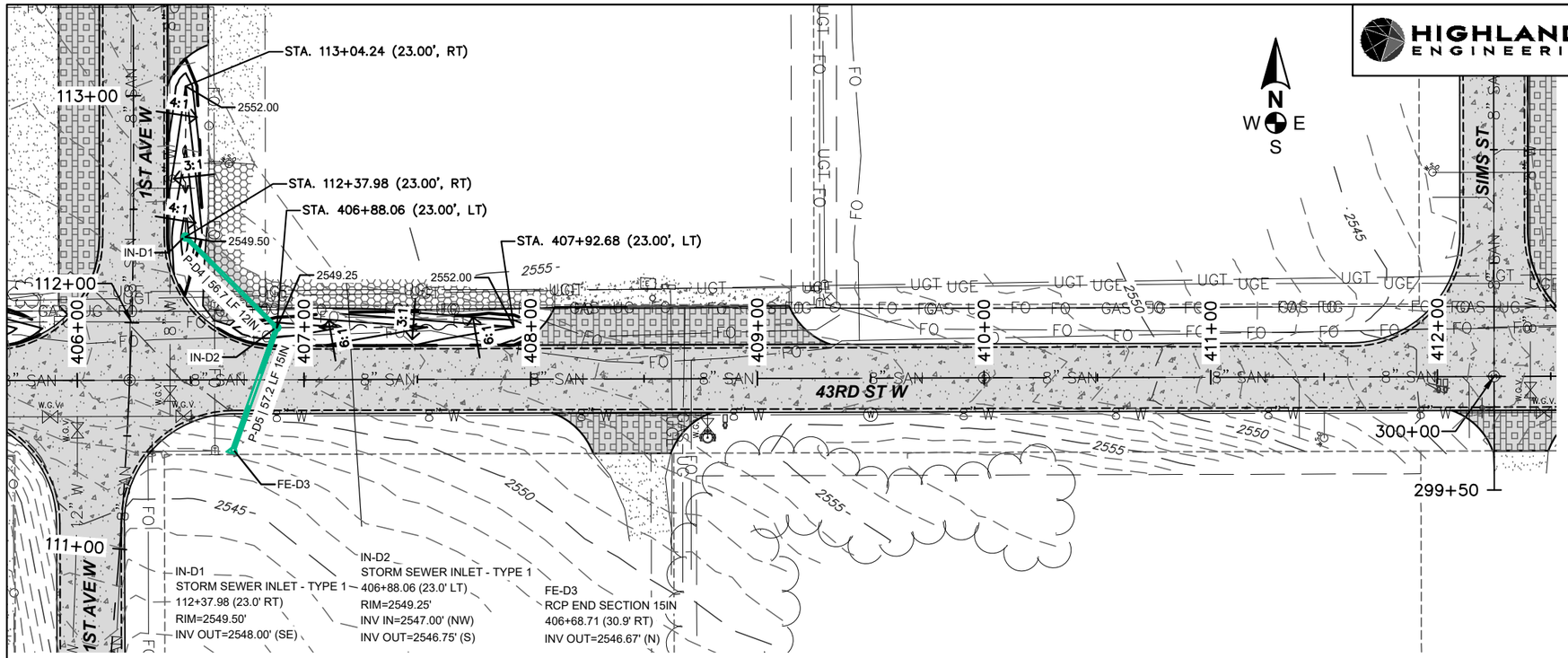
PLAN & PROFILE
43RD ST W
DITCH GRADING AND STORM SEWER

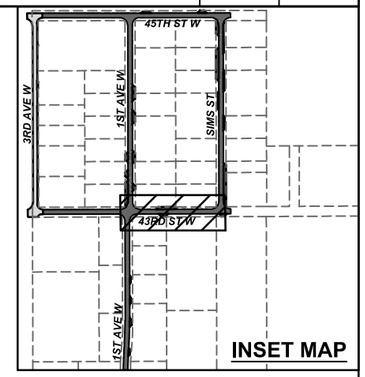
NORTH INDUSTRIES STREETS AND STORMWATER
DICKINSON, ND

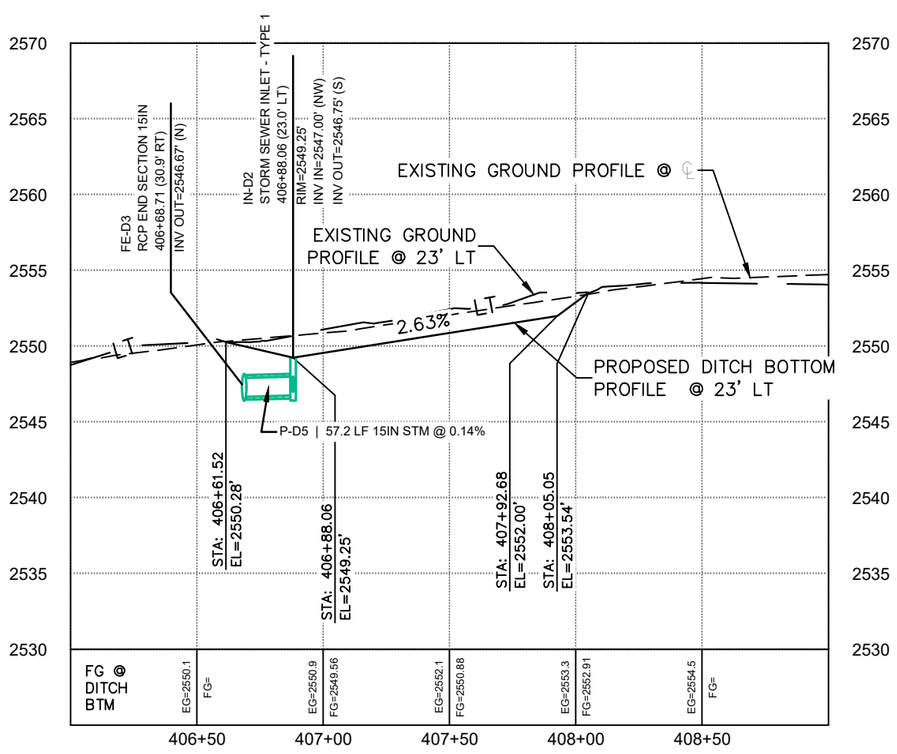
3/10/2025 4:45:42 PM schrank H:\231223\PROJECT CAD\CURRENT\231223_060PP_001_plan&profile.dwg

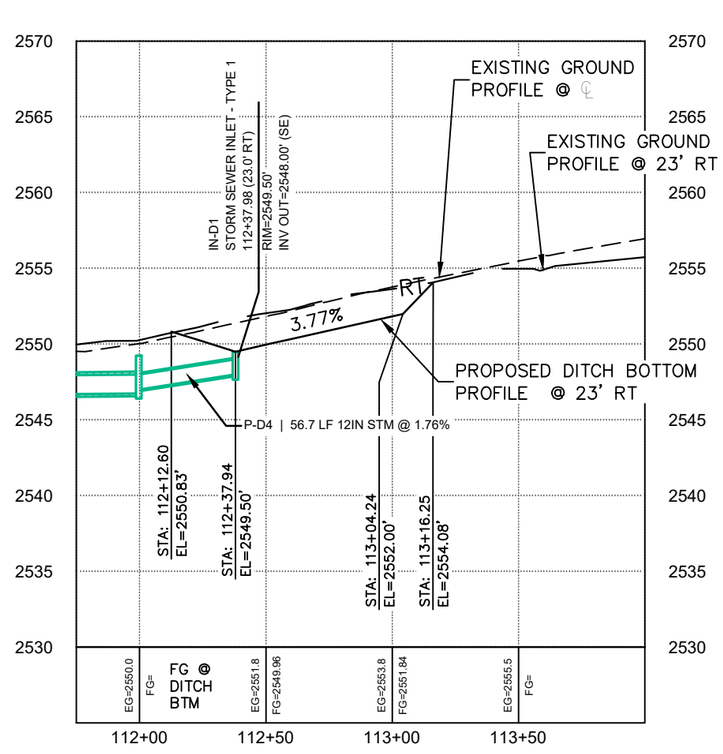
HIGHLANDS ENGINEERING

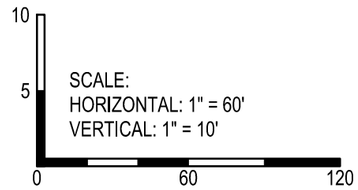
PROJECT NO.	SECTION NO.	SHEET NO.
CITY: 202316 / HE: 231223	60	2











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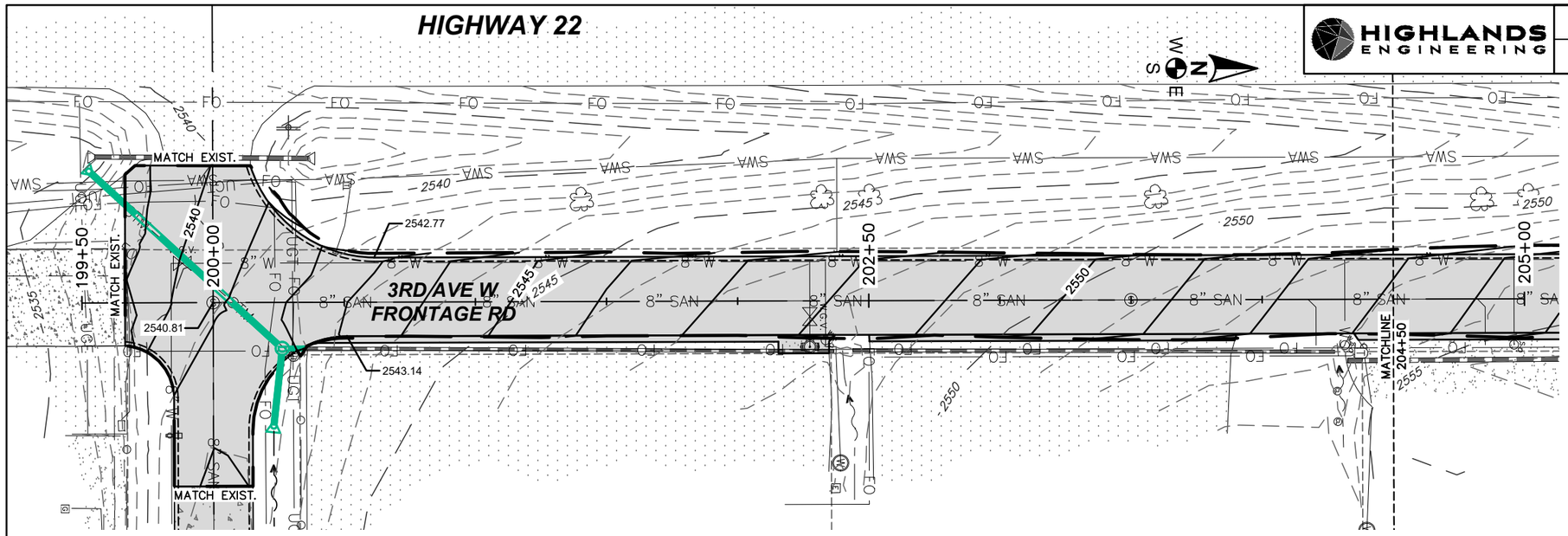
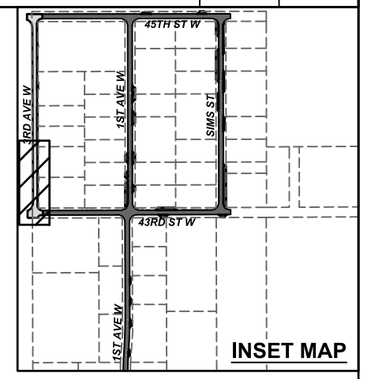
PLAN & PROFILE
43RD ST W & 1ST AVE W
DITCH GRADING AND STORM SEWER

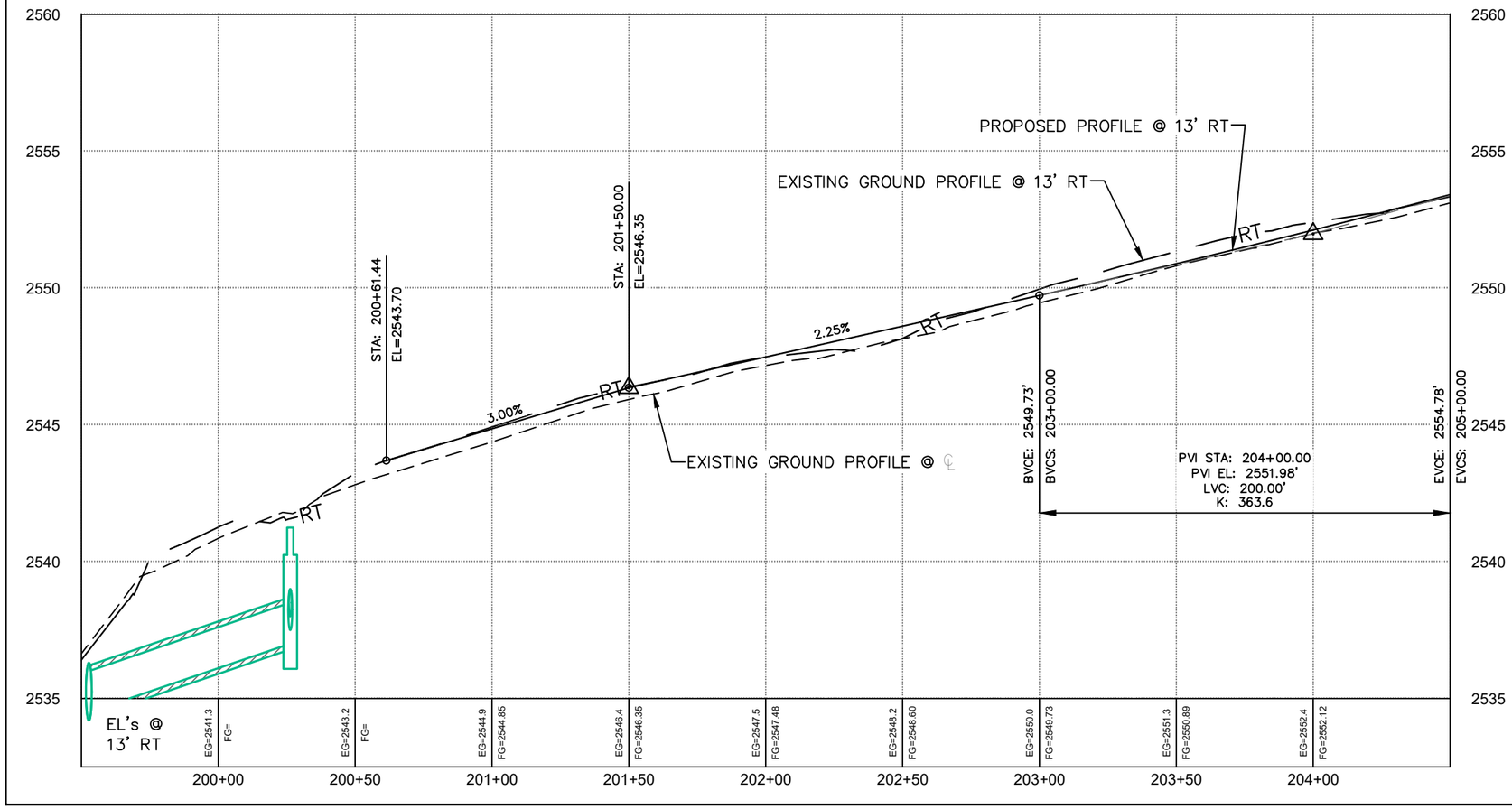
NORTH INDUSTRIES STREETS AND STORMWATER
DICKINSON, ND

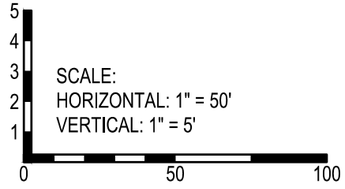
3/11/2025 2:26:16 PM schrank H:\231223\PROJECT CAD\CURRENT\231223_060PP_001_plan&profile.dwg

HIGHLANDS ENGINEERING	PROJECT NO.	SECTION NO.	SHEET NO.
	CITY: 202316 / HE: 231223	60	3









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PLAN & PROFILE
3RD AVE W FRONTAGE RD
ROADWAY GRADING

NORTH INDUSTRIES STREETS AND STORMWATER
DICKINSON, ND

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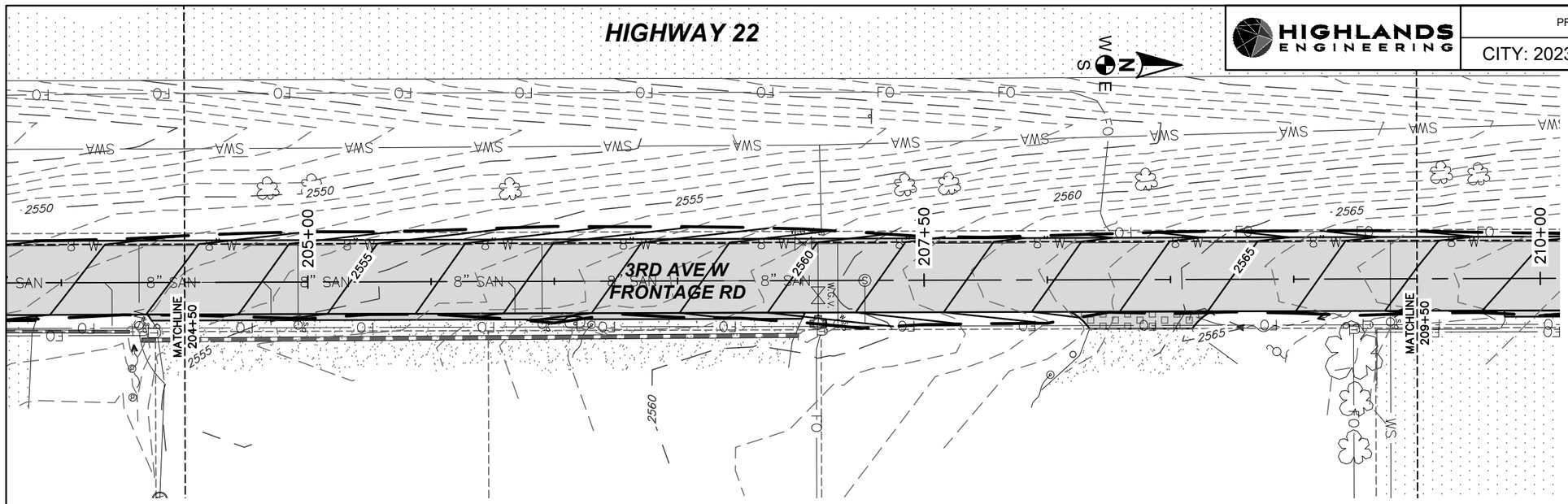
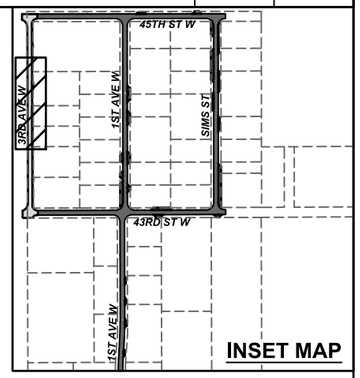
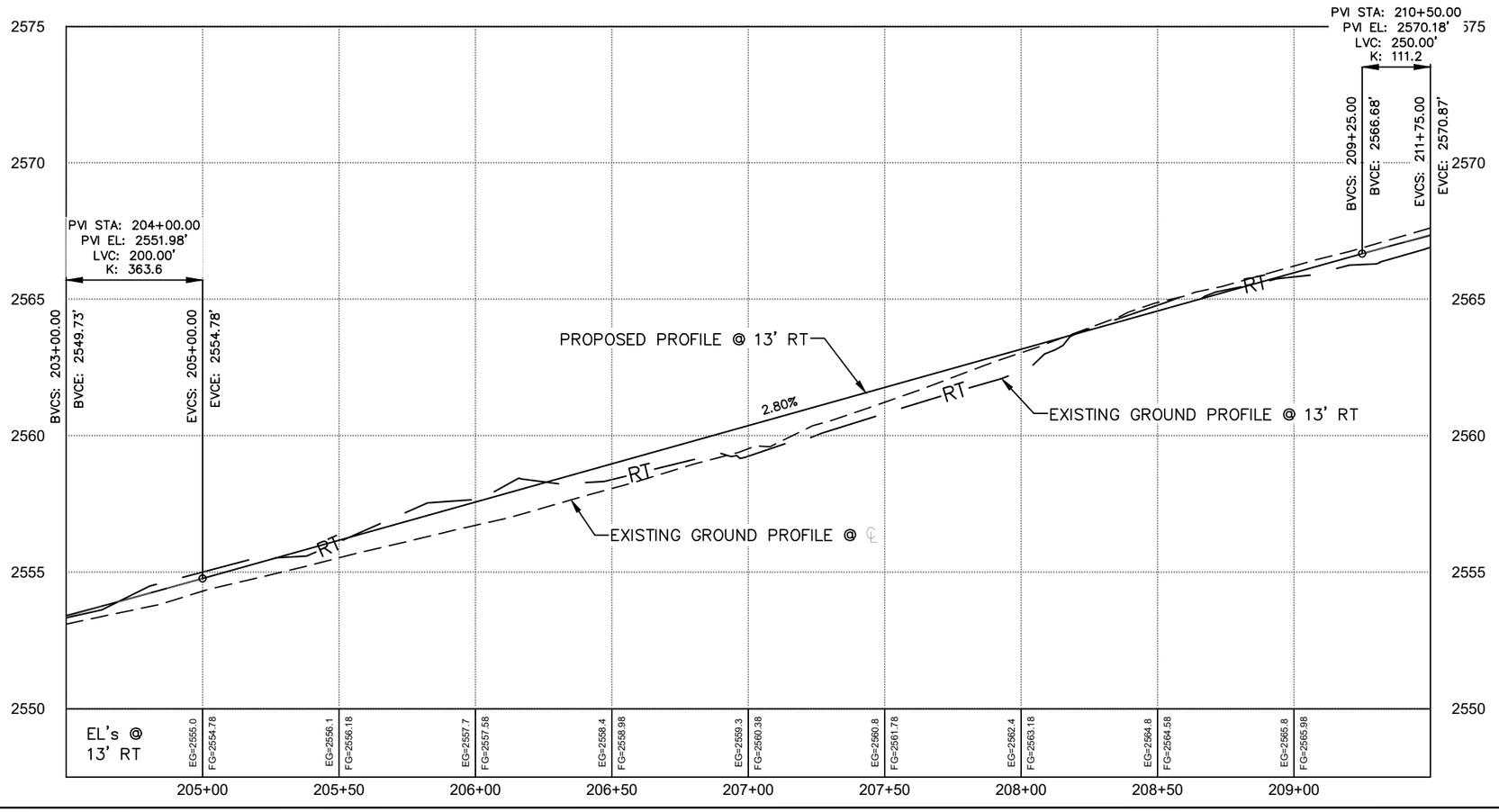
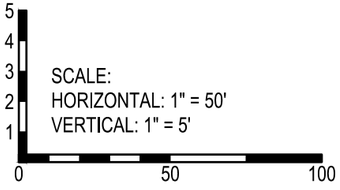
HIGHLANDS ENGINEERING	PROJECT NO.	SECTION NO.	SHEET NO.
	CITY: 202316 / HE: 231223	60	4









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PLAN & PROFILE
3RD AVE W FRONTAGE RD
ROADWAY GRADING

NORTH INDUSTRIES STREETS AND STORMWATER
DICKINSON, ND

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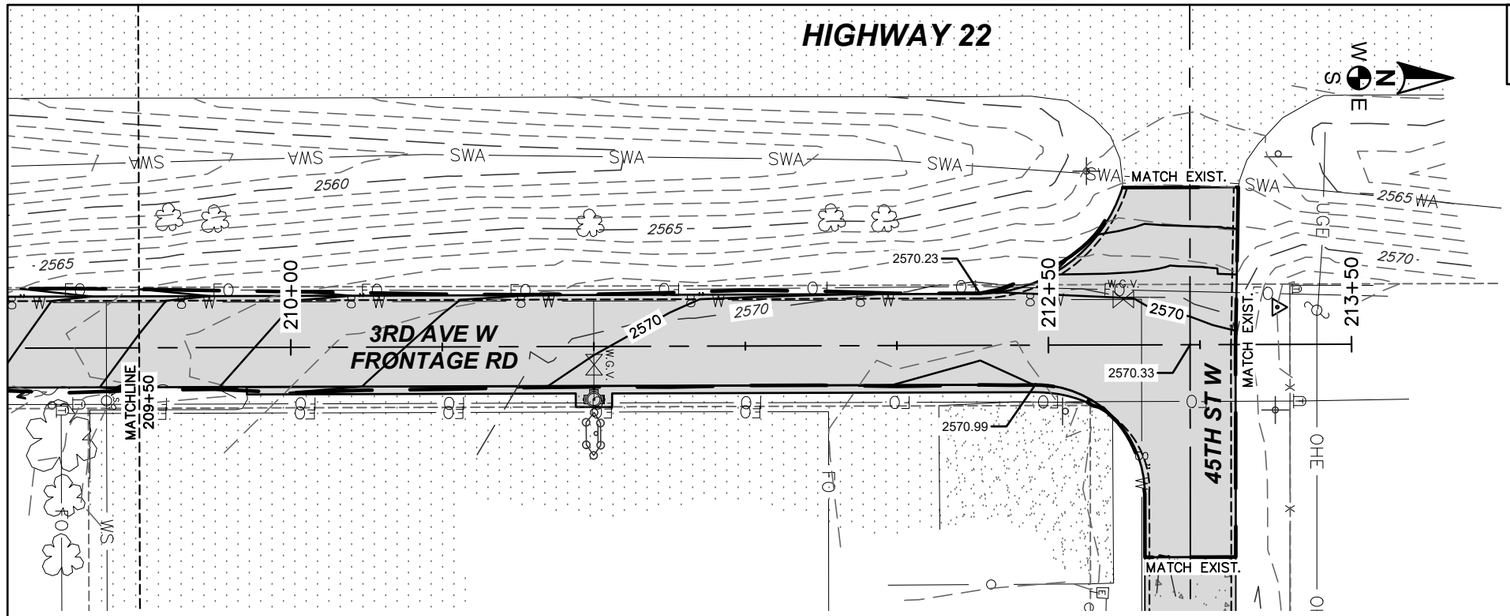
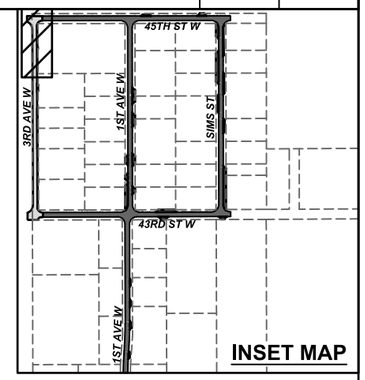
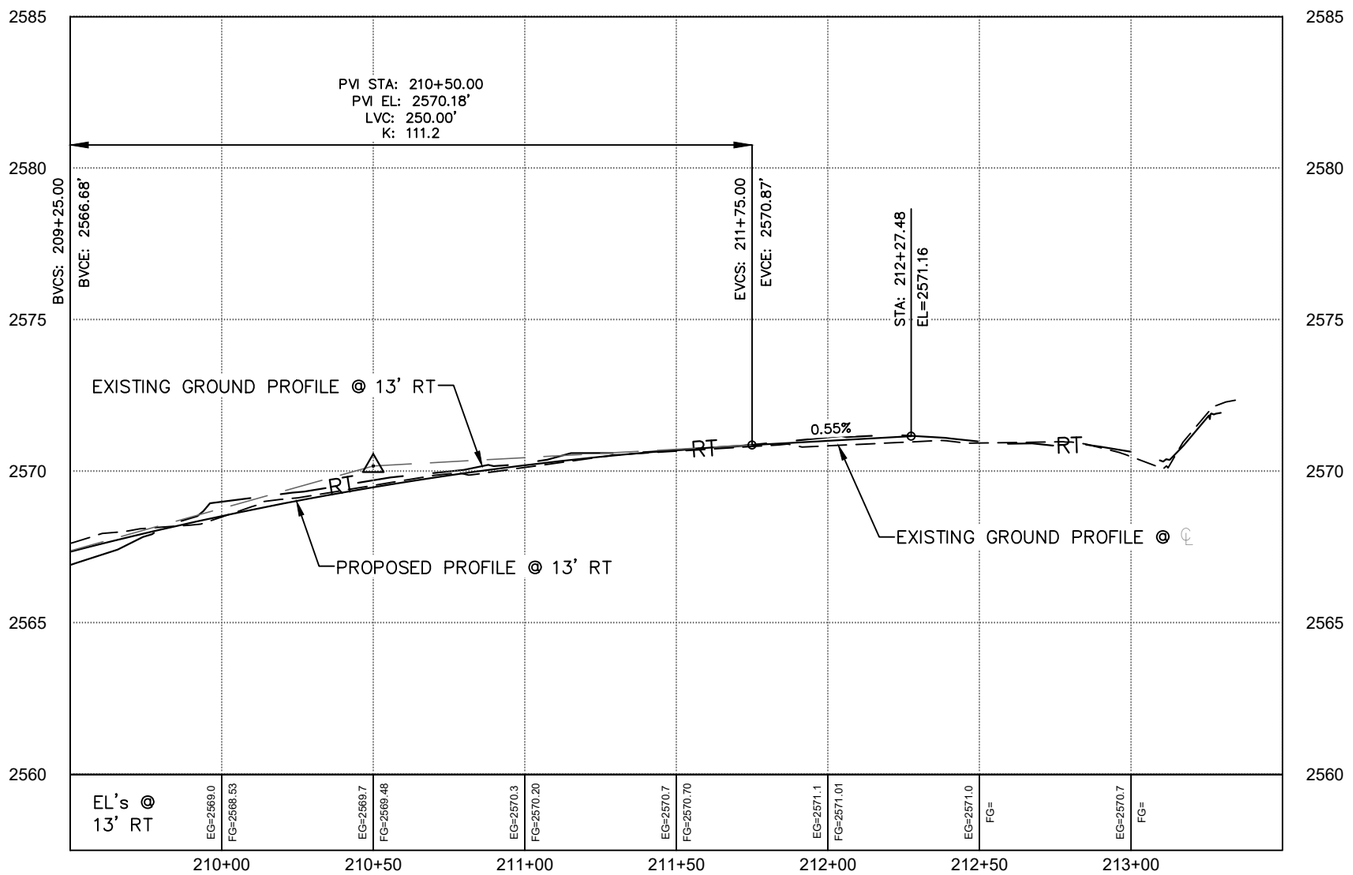
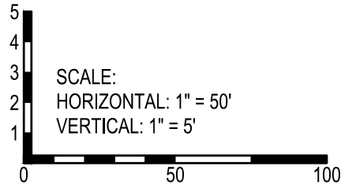
HIGHLANDS ENGINEERING	PROJECT NO.	SECTION NO.	SHEET NO.
	CITY: 202316 / HE: 231223	60	5









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PLAN & PROFILE
3RD AVE W FRONTAGE RD
ROADWAY GRADING

NORTH INDUSTRIES STREETS
AND STORMWATER
DICKINSON, ND

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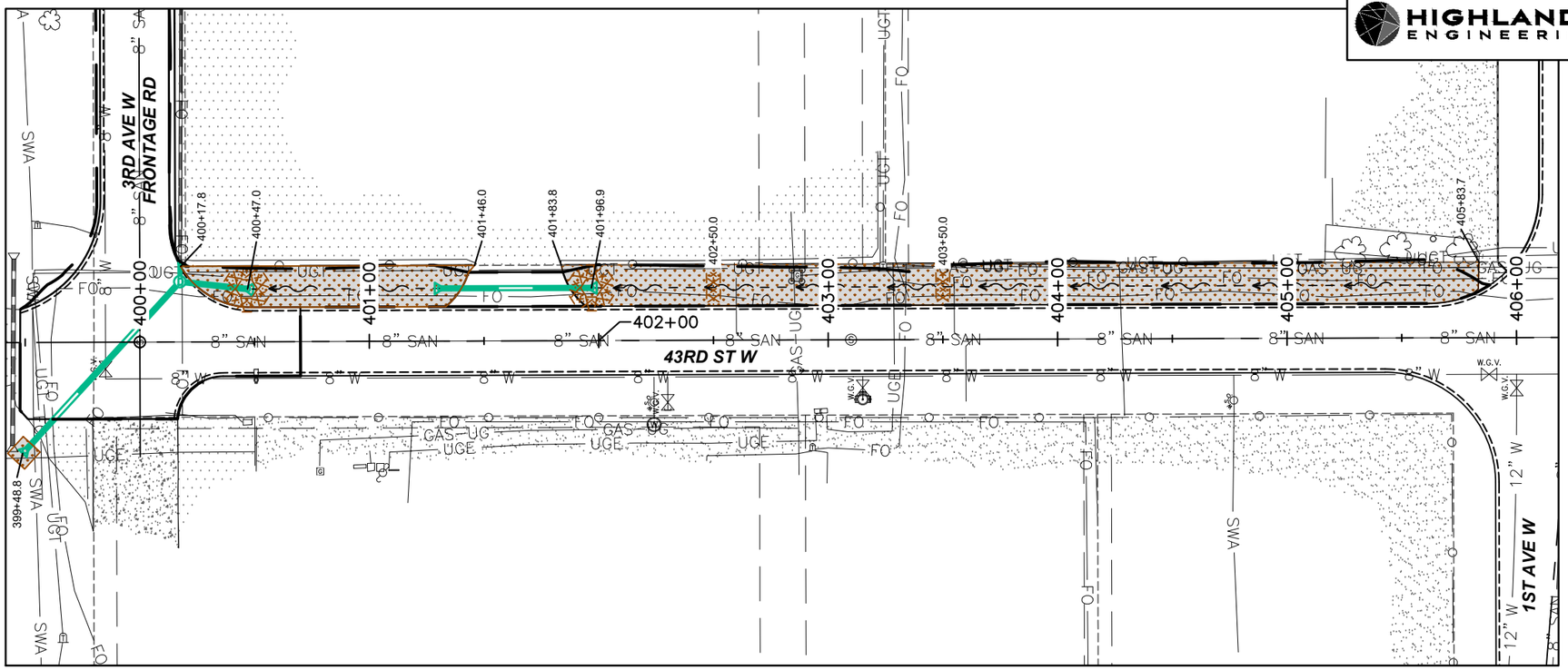
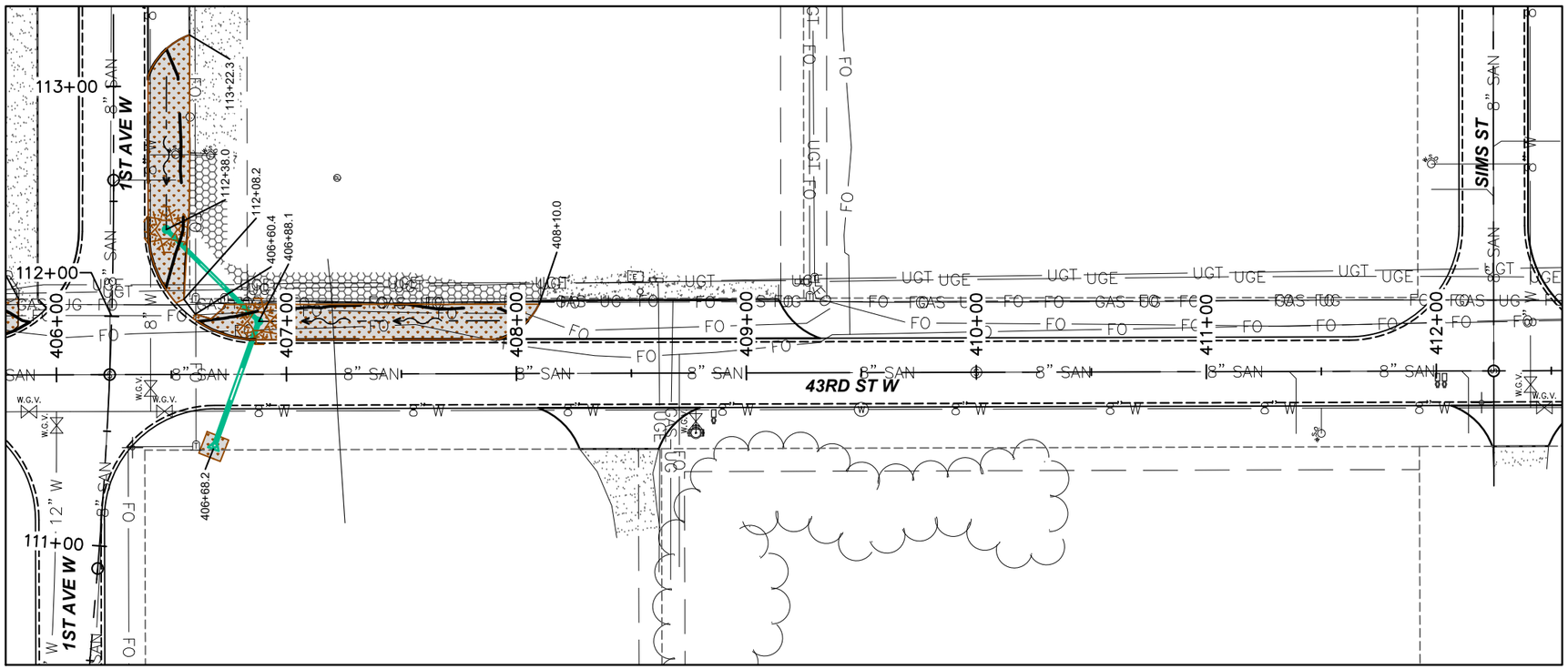
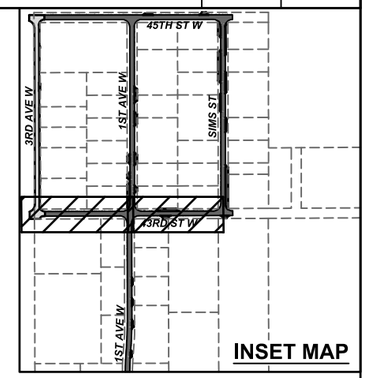
HIGHLANDS ENGINEERING	PROJECT NO.	SECTION NO.	SHEET NO.
	CITY: 202316 / HE: 231223	76	1







INSET MAP

LEGEND

QUANTITIES THIS SHEET

FIBER ROLL 12IN

Sta 400+47 LT	25 LF
Sta 401+97 LT	25 LF
Sta 402+50 LT	16 LF
Sta 403+50 LT	16 LF
Sta 406+88 LT	25 LF
Sta 112+38 RT	25 LF
	132 LF

TEMPORARY COVER CROP

Sta 399+49 RT	11 SY
Sta 400+18 to 401+46 LT	227 SY
Sta 401+84 to 405+84 LT	786 SY
Sta 406+60 to 408+10 LT	228 SY
Sta 406+68 RT	11 SY
Sta 112+08 to 113+22 RT	200 SY
	1463 SY

N
W E
S

0 60' 120'

SCALE: 1" = 60'

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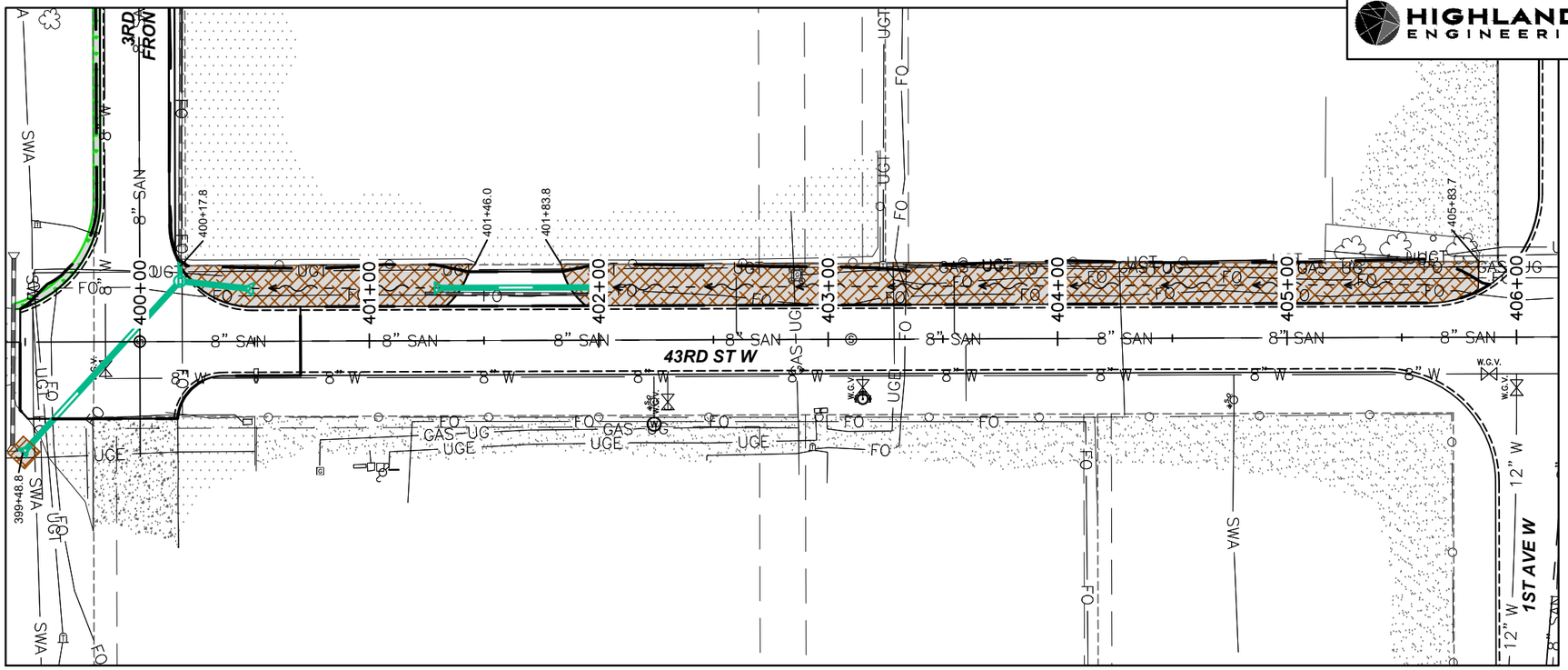
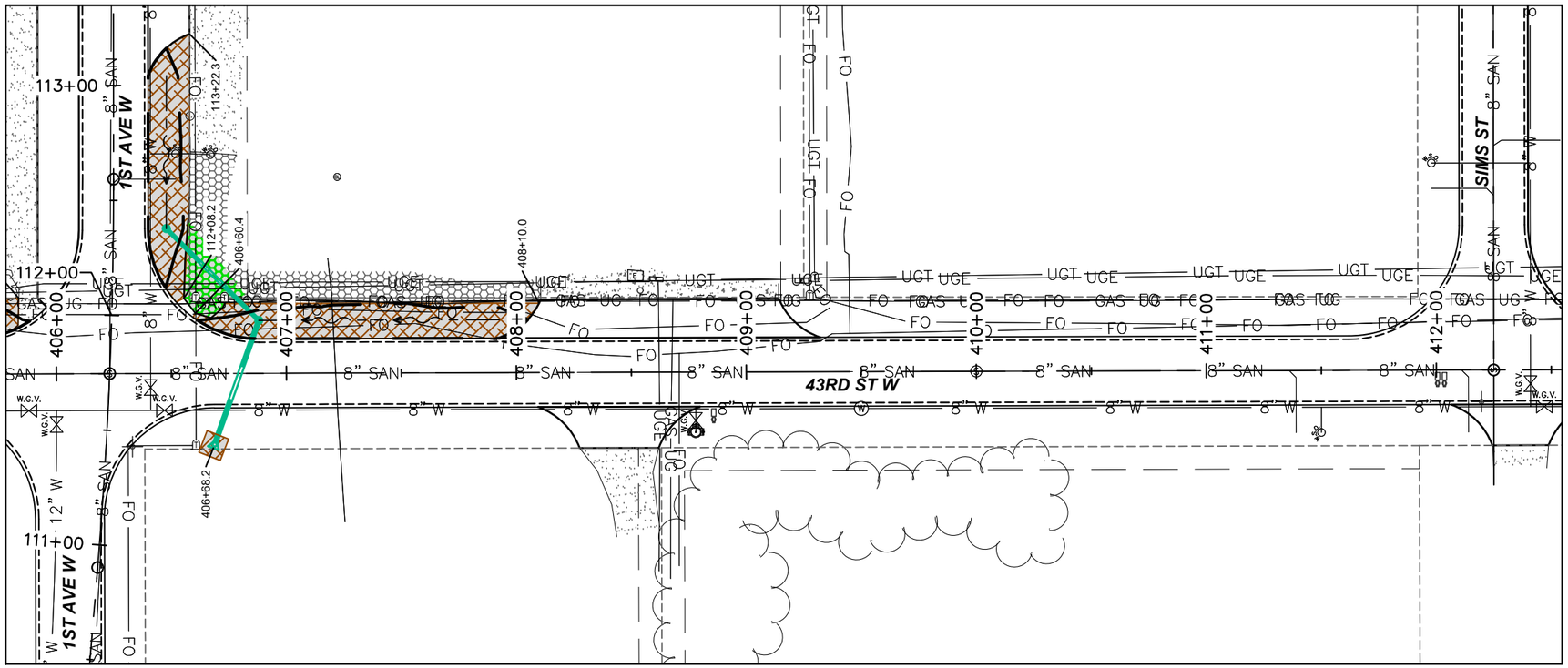
TEMPORARY EROSION CONTROL

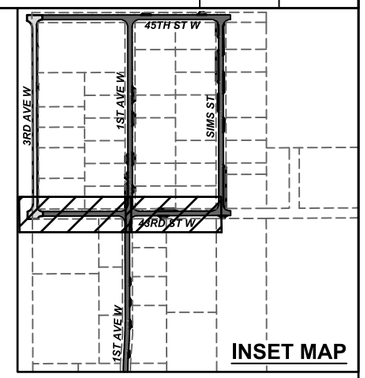
NORTH INDUSTRIES STREETS AND STORMWATER
DICKINSON, ND

3/10/2025 3:39:04 PM schrank H:\231223\PROJECT CAD\CURRENT\231223_076TE_001_temperosionctrl.dwg

HIGHLANDS ENGINEERING	PROJECT NO.	SECTION NO.	SHEET NO.
	CITY: 202316 / HE: 231223	77	1







INSET MAP

LEGEND

QUANTITIES THIS SHEET

PERMANENT SEED AND EROSION CONTROL BLANKET

Sta 399+49 RT	11 SY
Sta 400+18 to 401+46 LT	227 SY
Sta 401+84 to 405+84 LT	786 SY
Sta 406+60 to 408+10 LT	228 SY
Sta 406+68 RT	11 SY
Sta 112+08 to 113+22 RT	200 SY
	1463 SY

REMOVE & REPLACE LANDSCAPING

Sta 406+25 to 406+75 LT	1 LSUM

N
W E
S

0 60' 120'

SCALE: 1" = 60'

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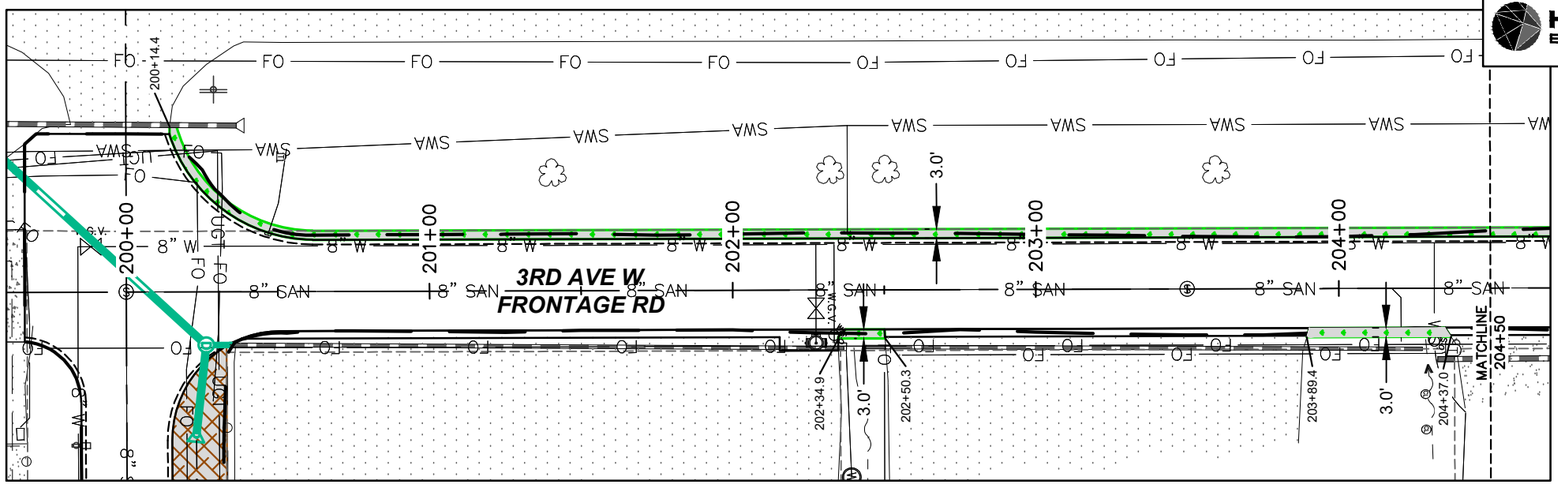
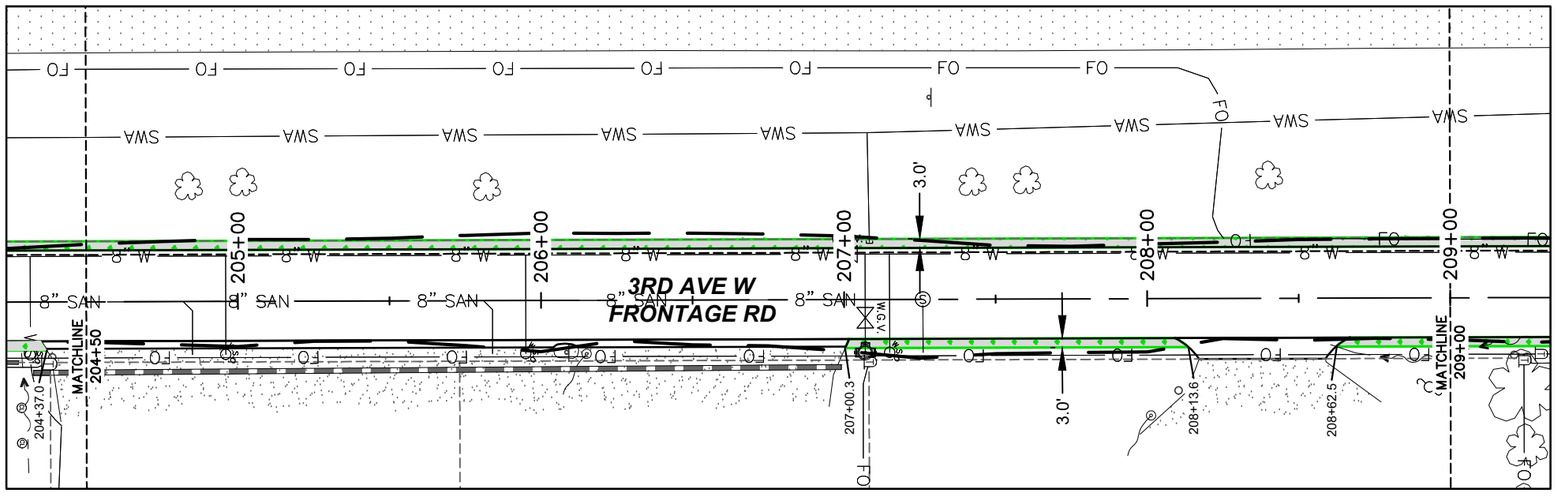
PERMANENT EROSION CONTROL
43rd St W

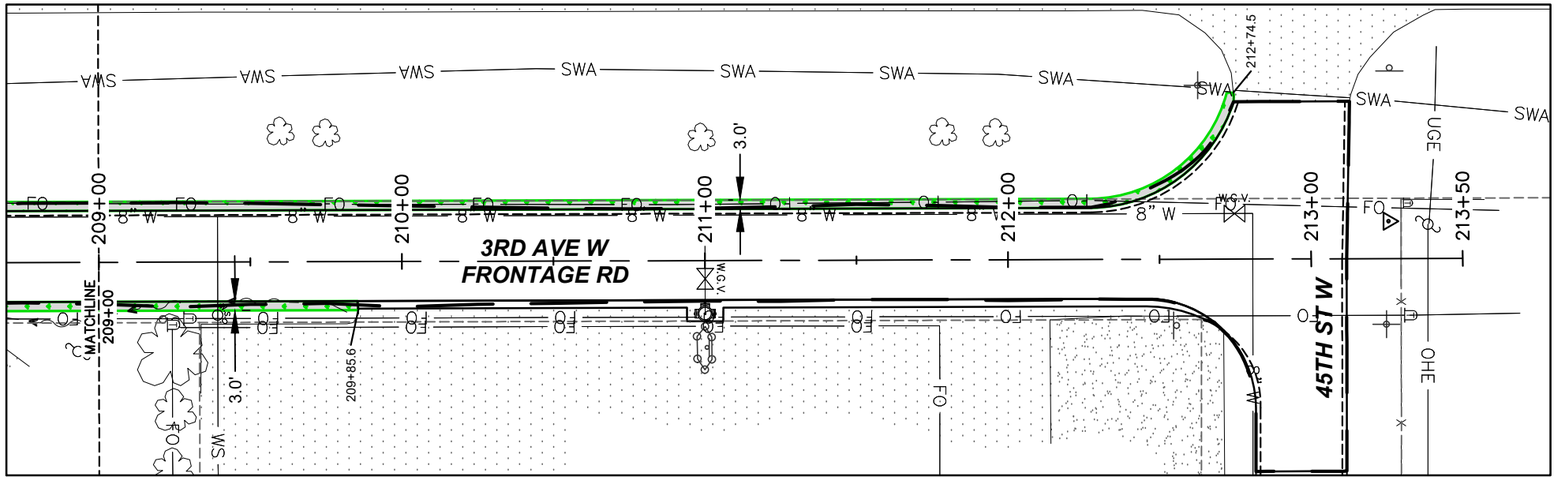
NORTH INDUSTRIES STREETS
AND STORMWATER
DICKINSON, ND

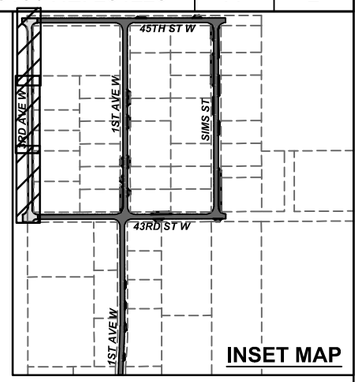
3/10/2025 3:43:02 PM schrank H:\231223\PROJECT CAD\CURRENT\231223_077PE_001_permerosionctrl.dwg

HIGHLANDS ENGINEERING	PROJECT NO.	SECTION NO.	SHEET NO.
	CITY: 202316 / HE: 231223	77	2







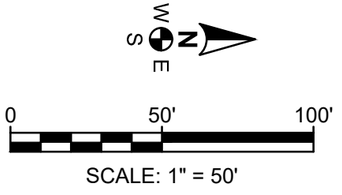


LEGEND

QUANTITIES THIS SHEET

PERMANENT SEED

Sta 200+14 to 212+75	528 SY



SCALE: 1" = 50'

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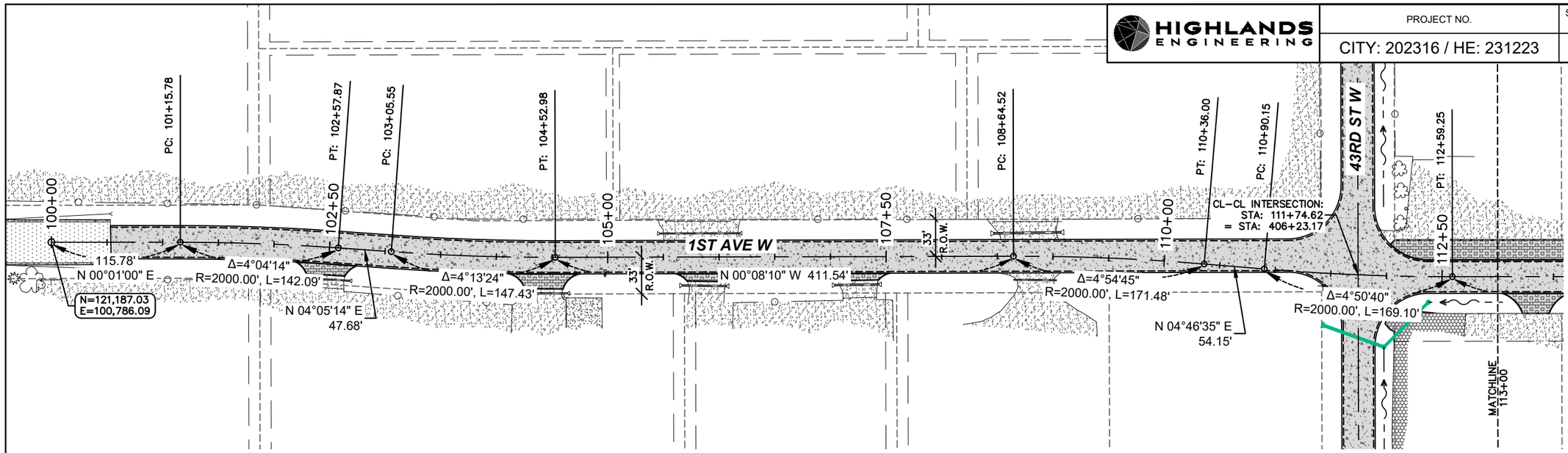
PERMANENT EROSION CONTROL
3rd Ave W

NORTH INDUSTRIES STREETS AND STORMWATER
DICKINSON, ND

HIGHLANDS ENGINEERING	PROJECT NO.	SECTION NO.	SHEET NO.
	CITY: 202316 / HE: 231223	82	1



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SURVEY NOTES:

Hoizontal Datum: All coordinates are derived from a local coordinate system. Measurements are ground distance, international foot definition.

Vertical Datum: NAVD-88, GEOID03 (CONUS)

0 100' 200'

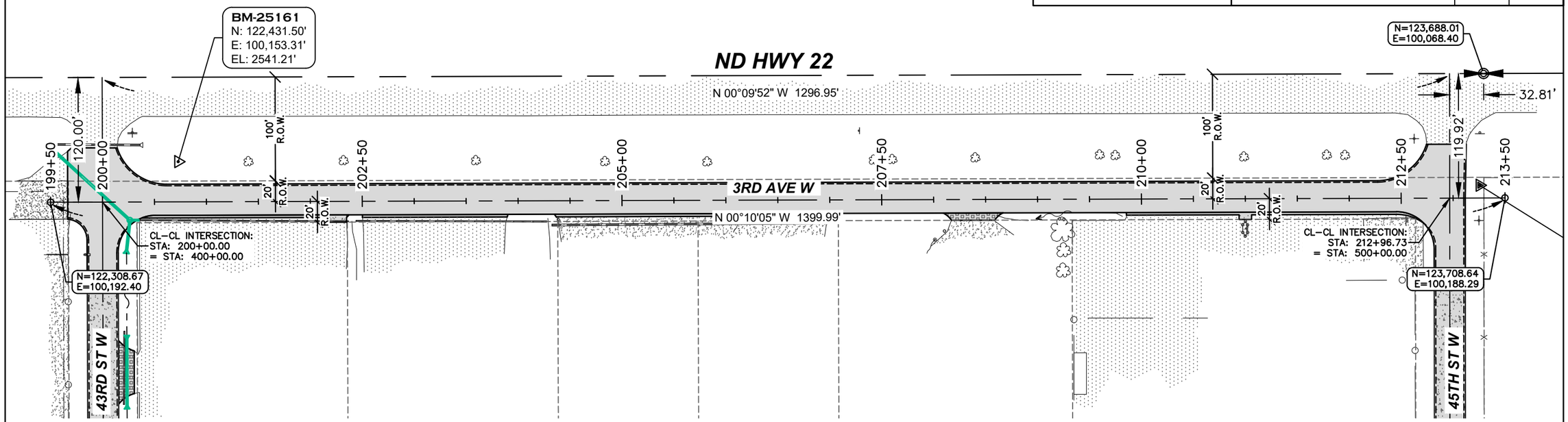
SCALE: 1" = 100'

SURVEY DATA LAYOUTS
1ST AVE W

NORTH INDUSTRIES STREETS AND STORMWATER
DICKINSON, ND

3/10/2025 3:44:53 PM schrank H:\231223\PROJECT CAD\CURRENT\231223_082SD_001_surveylayout.dwg

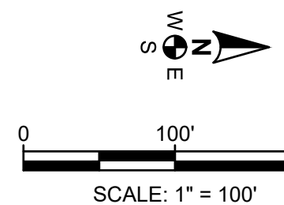
HIGHLANDS ENGINEERING	PROJECT NO.	SECTION NO.	SHEET NO.
	CITY: 202316 / HE: 231223	82	2



SURVEY NOTES:

Hoizontal Datum: All coordinates are derived from a local coordinate system. Measurements are ground distance, international foot definition.

Vertical Datum: NAVD-88, GEOID03 (CONUS)



SCALE: 1" = 100'

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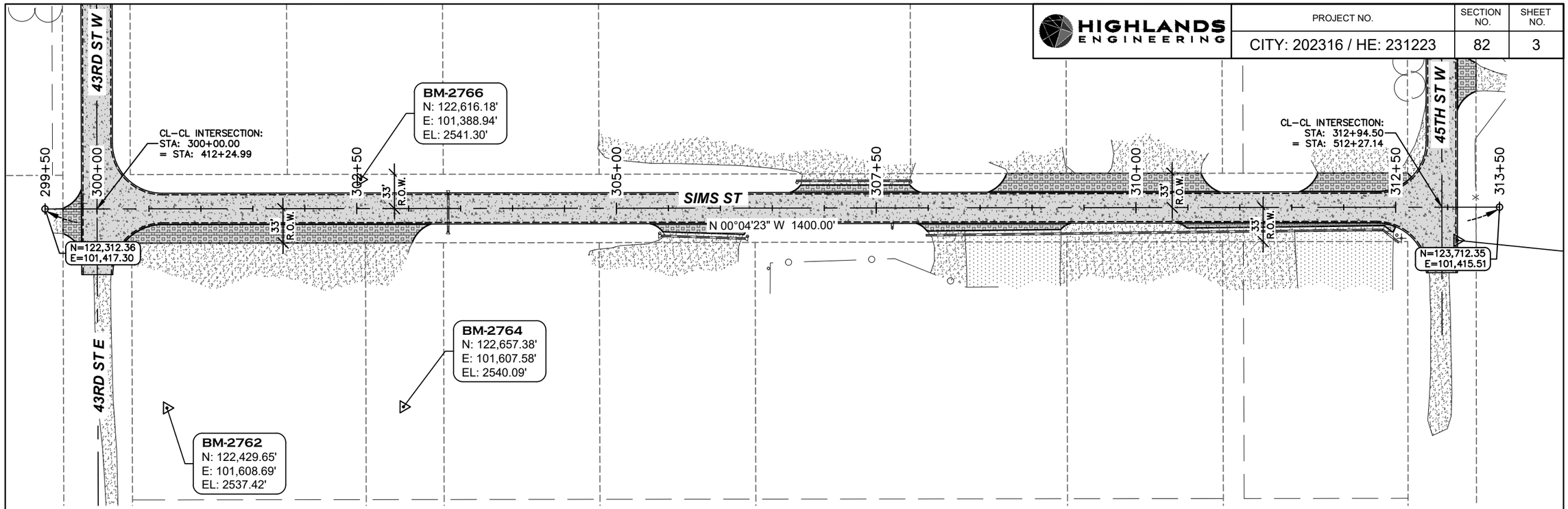
SURVEY DATA LAYOUTS
3RD AVE W

NORTH INDUSTRIES STREETS AND STORMWATER
DICKINSON, ND

HIGHLANDS ENGINEERING	PROJECT NO.	SECTION NO.	SHEET NO.
	CITY: 202316 / HE: 231223	82	3



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SURVEY NOTES:

Hoizontal Datum: All coordinates are derived from a local coordinate system. Measurements are ground distance, international foot definition.

Vertical Datum: NAVD-88, GEOID03 (CONUS)

W E S N

0 100' 200'

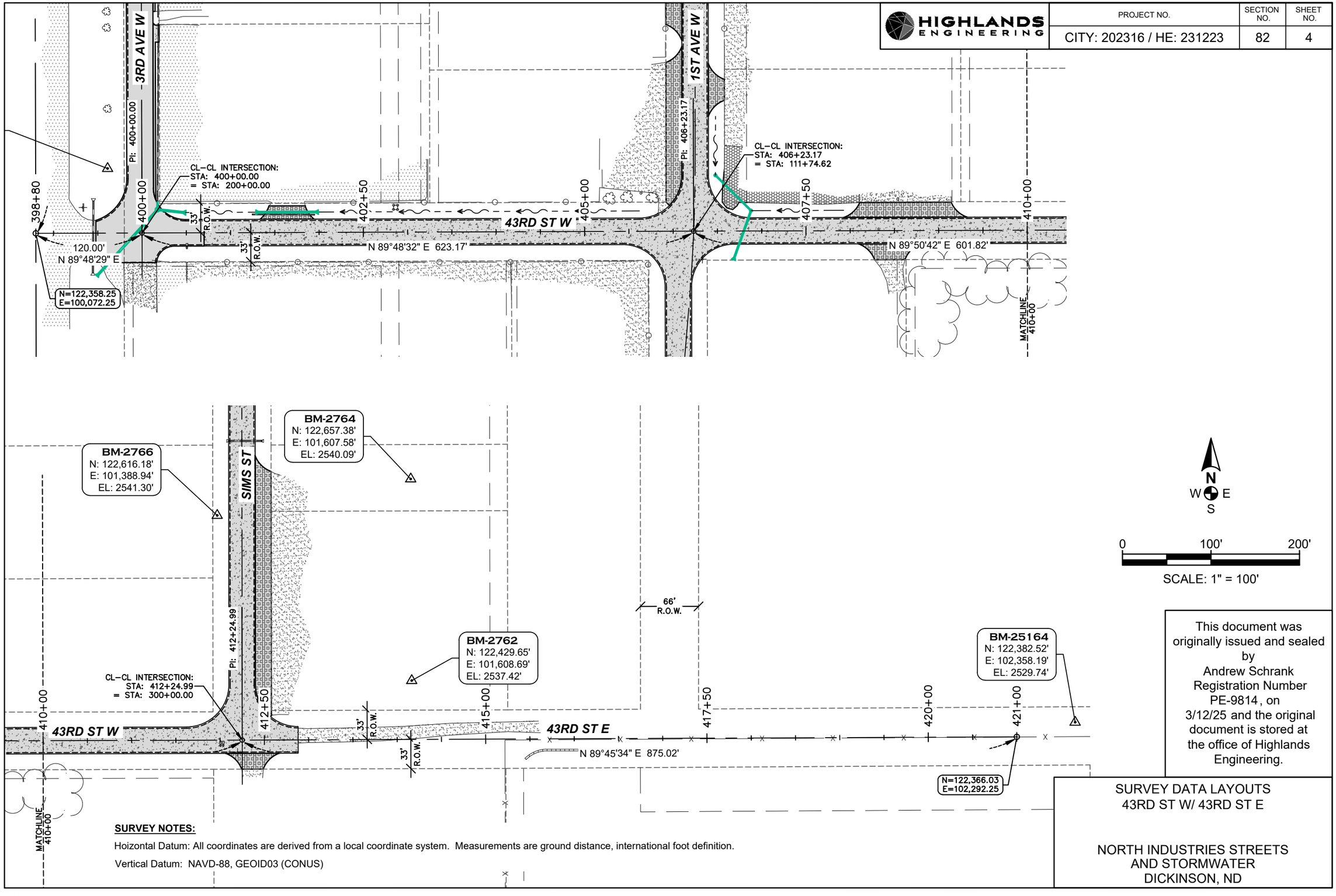
SCALE: 1" = 100'

SURVEY DATA LAYOUTS
SIMS ST

NORTH INDUSTRIES STREETS AND STORMWATER
DICKINSON, ND

3/10/2025 3:44:53 PM schrank H:\231223\PROJECT CAD\CURRENT\231223_082SD_001_surveylayout.dwg

HIGHLANDS ENGINEERING	PROJECT NO.	SECTION NO.	SHEET NO.
	CITY: 202316 / HE: 231223	82	4



SURVEY NOTES:

Hoizontal Datum: All coordinates are derived from a local coordinate system. Measurements are ground distance, international foot definition.

Vertical Datum: NAVD-88, GEOID03 (CONUS)

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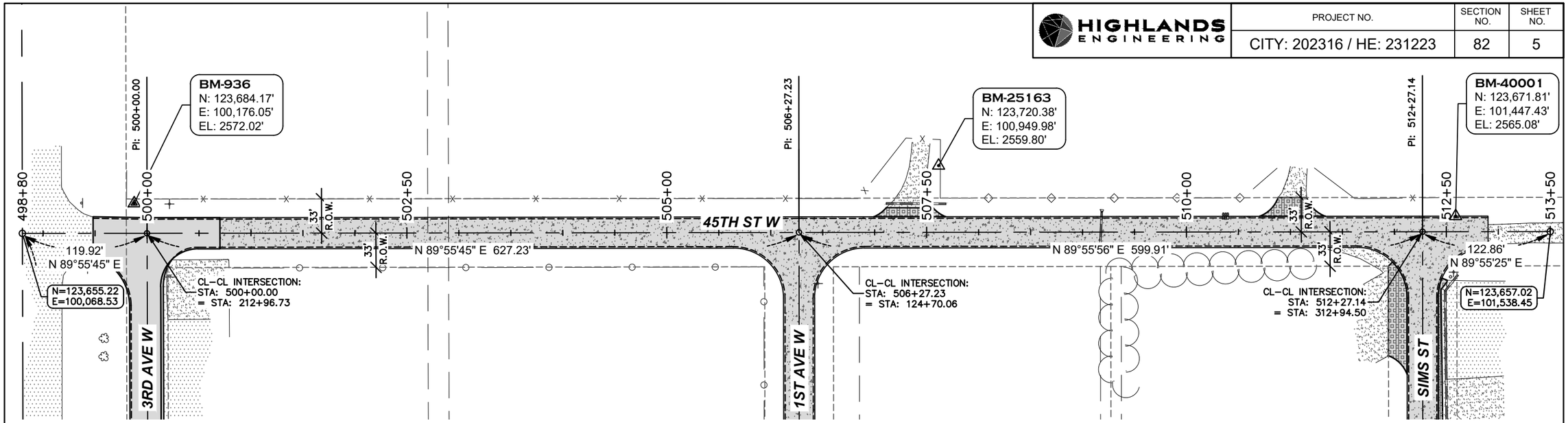
SURVEY DATA LAYOUTS
43RD ST W/ 43RD ST E

NORTH INDUSTRIES STREETS
AND STORMWATER
DICKINSON, ND

3/10/2025 3:44:53 PM schrank H:\231223\PROJECT CAD\CURRENT\231223_082SD_001_surveylayout.dwg

HIGHLANDS ENGINEERING	PROJECT NO.	SECTION NO.	SHEET NO.
	CITY: 202316 / HE: 231223	82	5



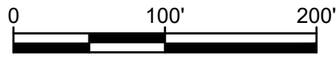
CONTROL POINT LIST

POINT ID	NORTHING	EASTING	ELEVATION
BM-936	123684.173	100176.054	2572.022
BM-1584	121047.568	102709.586	2505.62
BM-1590	123691.485	102705.985	2551.536
BM-2762	122429.649	101608.686	2537.417
BM-2764	122657.383	101607.577	2540.091
BM-2766	122616.181	101388.936	2541.296
BM-3380	121038.403	100075.866	2523.62
BM-3393	121082	101981.043	2503.97
BM-25160	121082.944	102650.423	2504.329
BM-25161	122431.499	100153.306	2541.207
BM-25163	123720.381	100949.984	2559.804
BM-25164	122382.522	102358.188	2529.743
BM-40001	123671.813	101447.429	2565.076
BM-40002	121086.433	100160.679	2519.82

SURVEY NOTES:

Hoizontal Datum: All coordinates are derived from a local coordinate system. Measurements are ground distance, international foot definition.

Vertical Datum: NAVD-88, GEOID03 (CONUS)



SCALE: 1" = 100'

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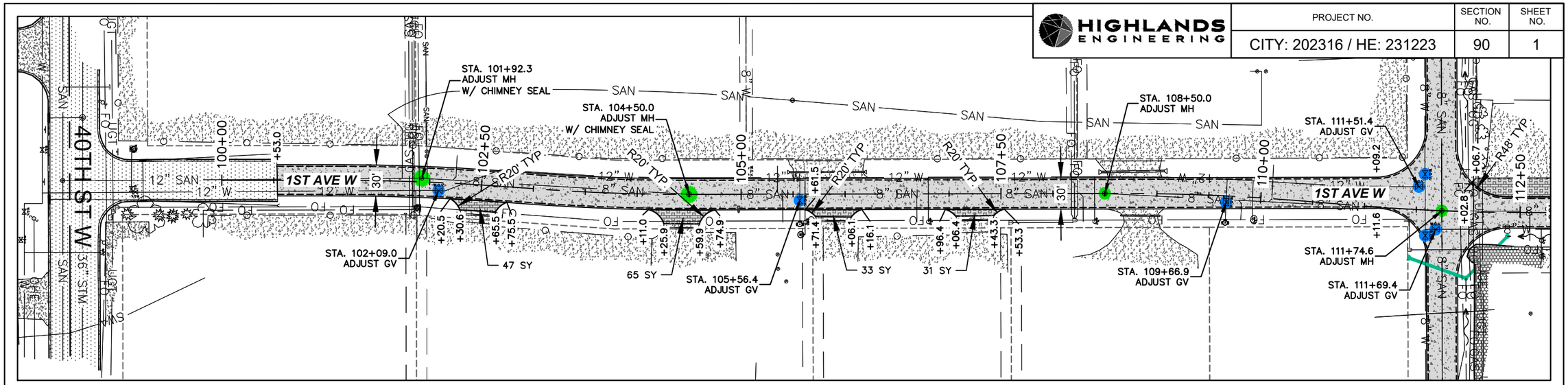
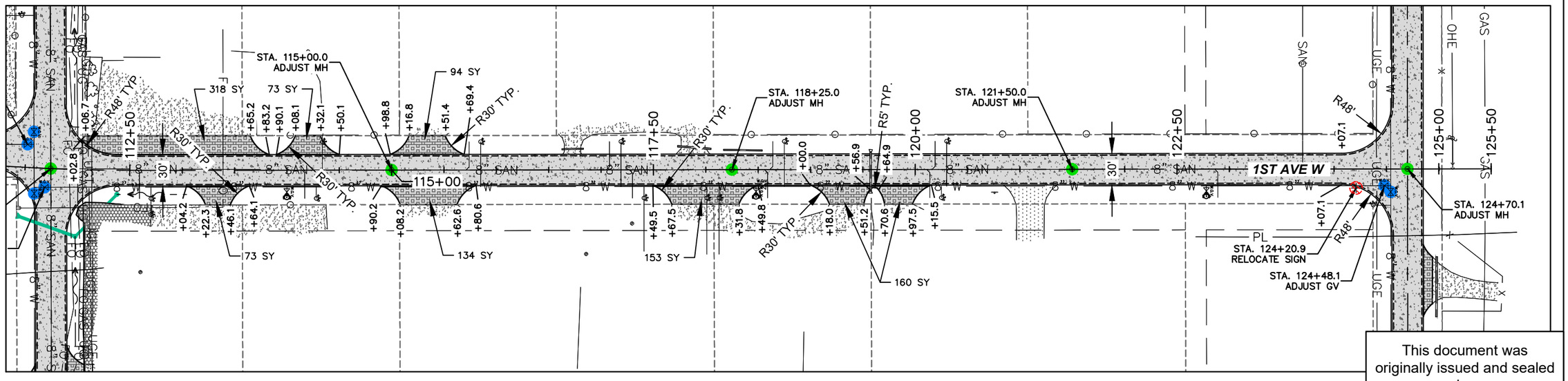
SURVEY DATA LAYOUTS
45TH ST W/ 45TH ST E

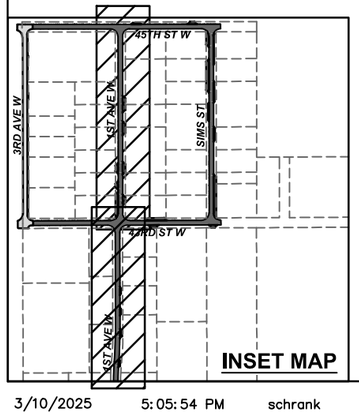
NORTH INDUSTRIES STREETS AND STORMWATER
DICKINSON, ND

HIGHLANDS ENGINEERING

PROJECT NO.	SECTION NO.	SHEET NO.
CITY: 202316 / HE: 231223	90	1







LEGEND

- ASPHALT PAVEMENT
- CEMENT STABILIZE SUBGRADE & AGGREGATE SURFACING - MAINLINE
- CEMENT STABILIZE SUBGRADE & AGGREGATE SURFACING - DRIVEWAY
- CHIMNEY SEAL
- ADJUST MANHOLE
- ADJUST GATE VALVE
- RELOCATE SIGN OR MAILBOX

N W S E

0 100' 200'

SCALE: 1" = 100'

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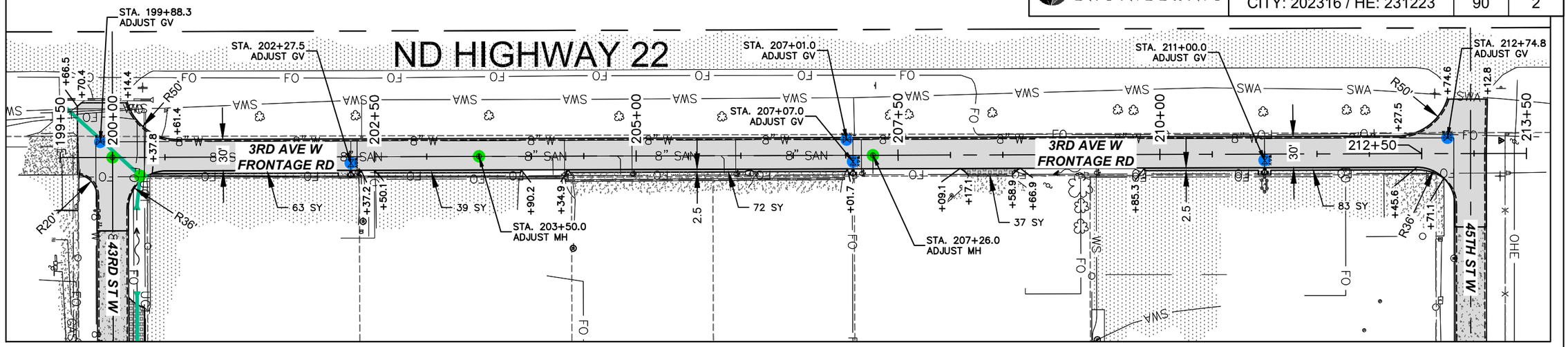
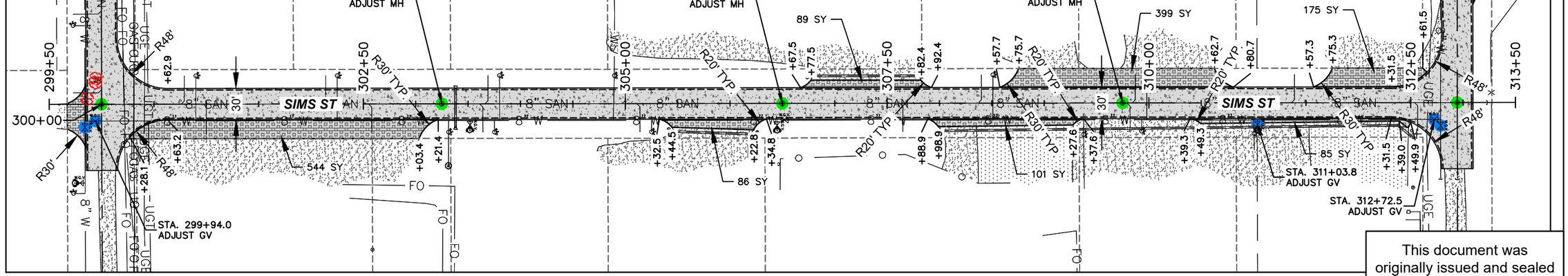
SURFACING PLAN
1st Ave W

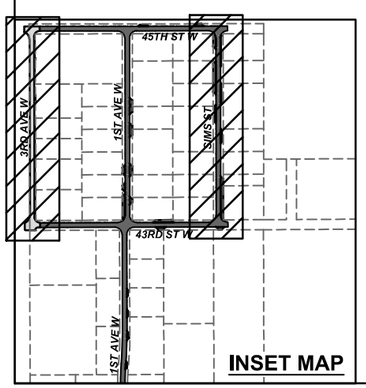
NORTH INDUSTRIES STREETS AND STORMWATER
DICKINSON, ND

3/10/2025 5:05:54 PM schrank H:\231223\PROJECT CAD\CURRENT\231223_090PL_001_pvnglayout.dwg

HIGHLANDS ENGINEERING	PROJECT NO.	SECTION NO.	SHEET NO.
	CITY: 202316 / HE: 231223	90	2







LEGEND

- ASPHALT PAVEMENT
- CEMENT STABILIZE SUBGRADE & AGGREGATE SURFACING - MAINLINE
- CEMENT STABILIZE SUBGRADE & AGGREGATE SURFACING - DRIVEWAY
- ADJUST MANHOLE
- ADJUST GATE VALVE
- RELOCATE SIGN OR MAILBOX

N W E S

0 100' 200'

SCALE: 1" = 100'

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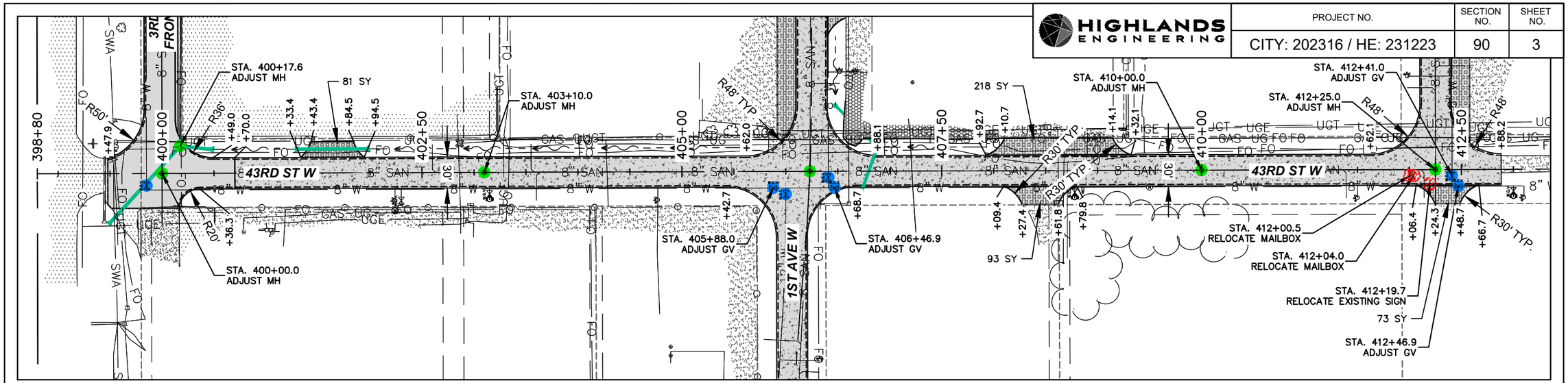
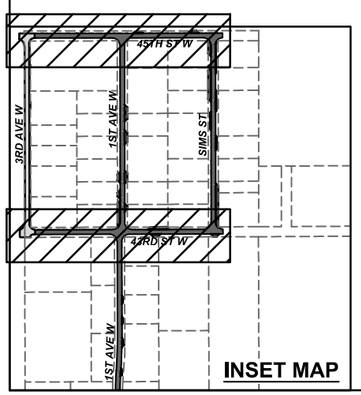
SURFACING PLAN
3rd Ave W Frontage Road and Sims Street

NORTH INDUSTRIES STREETS AND STORMWATER
DICKINSON, ND

3/10/2025 5:05:54 PM schrank H:\231223\PROJECT CAD\CURRENT\231223_090PL_001_pvnglayout.dwg

HIGHLANDS ENGINEERING	PROJECT NO.	SECTION NO.	SHEET NO.
	CITY: 202316 / HE: 231223	90	3





LEGEND

- ASPHALT PAVEMENT
- CEMENT STABILIZE SUBGRADE & AGGREGATE SURFACING - MAINLINE
- CEMENT STABILIZE SUBGRADE & AGGREGATE SURFACING - DRIVEWAY
- ADJUST MANHOLE
- ADJUST GATE VALVE
- RELOCATE SIGN OR MAILBOX

N
W E
S

0 100' 200'

SCALE: 1" = 100'

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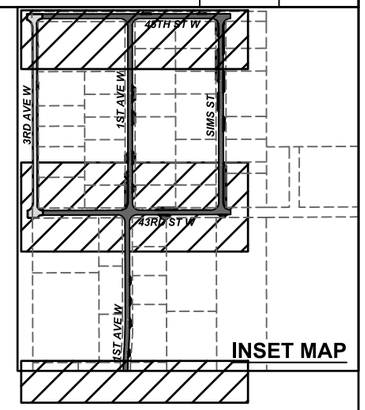
SURFACING PLAN
43rd Street and 45th Street

NORTH INDUSTRIES STREETS AND STORMWATER
DICKINSON, ND

3/10/2025 5:05:54 PM schrank H:\231223\PROJECT CAD\CURRENT\231223_090PL_001_pvnglayout.dwg

HIGHLANDS ENGINEERING	PROJECT NO.	SECTION NO.	SHEET NO.
	CITY: 202316 / HE: 231223	100	1



N
W E
S

0 150' 300'

SCALE: 1" = 150'

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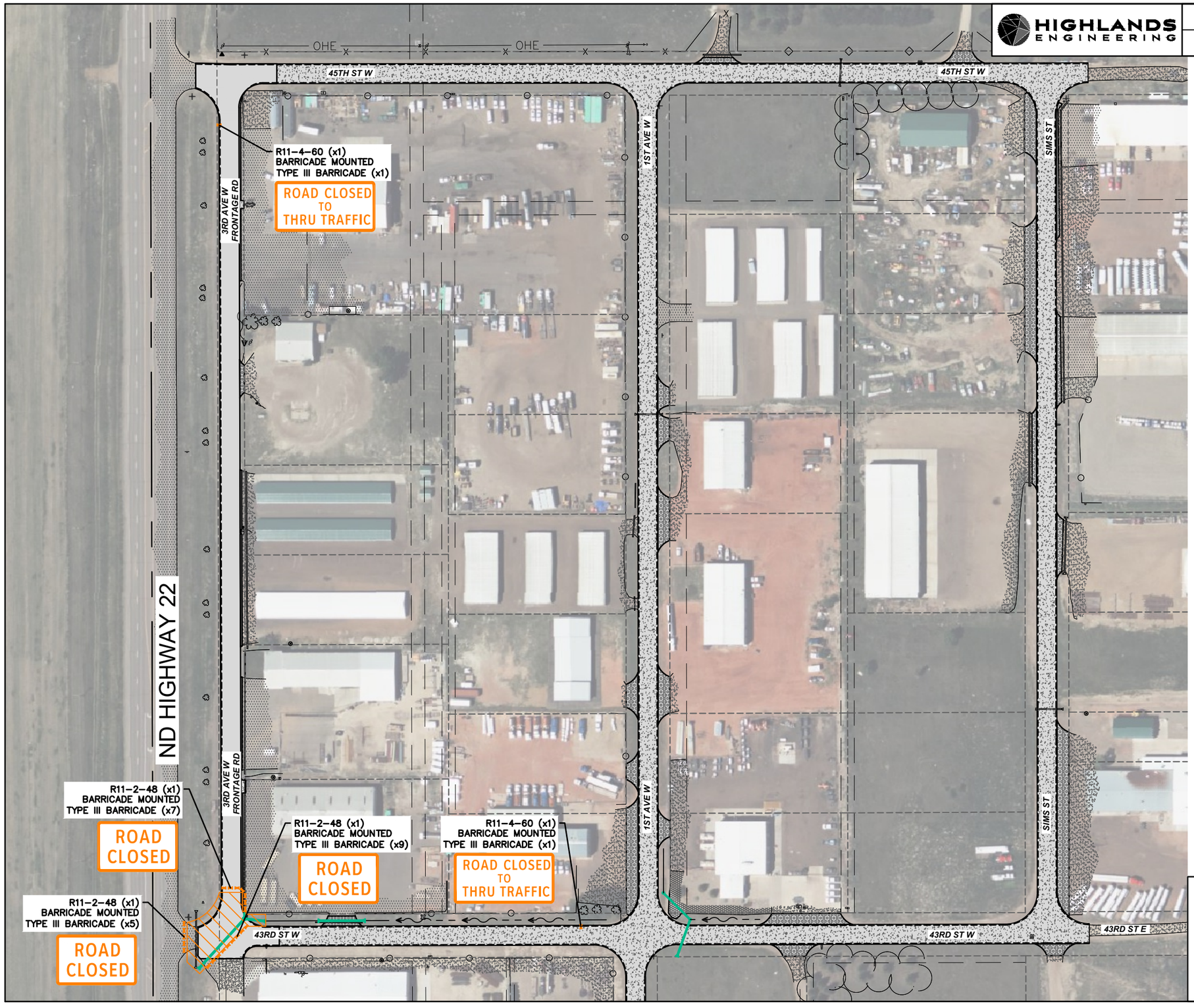
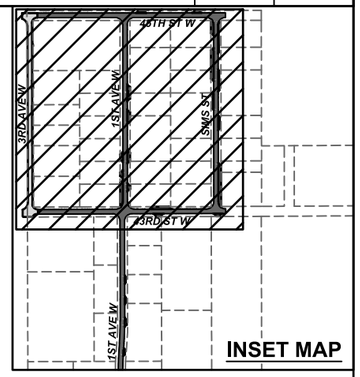
WORK ZONE TRAFFIC CONTROL
ALL PHASES

NORTH INDUSTRIES STREETS
AND STORMWATER
DICKINSON, ND

HIGHLANDS ENGINEERING	PROJECT NO.	SECTION NO.	SHEET NO.
	CITY: 202316 / HE: 231223	100	2





INSET MAP

N
W E
S

0 150' 300'

SCALE: 1" = 150'

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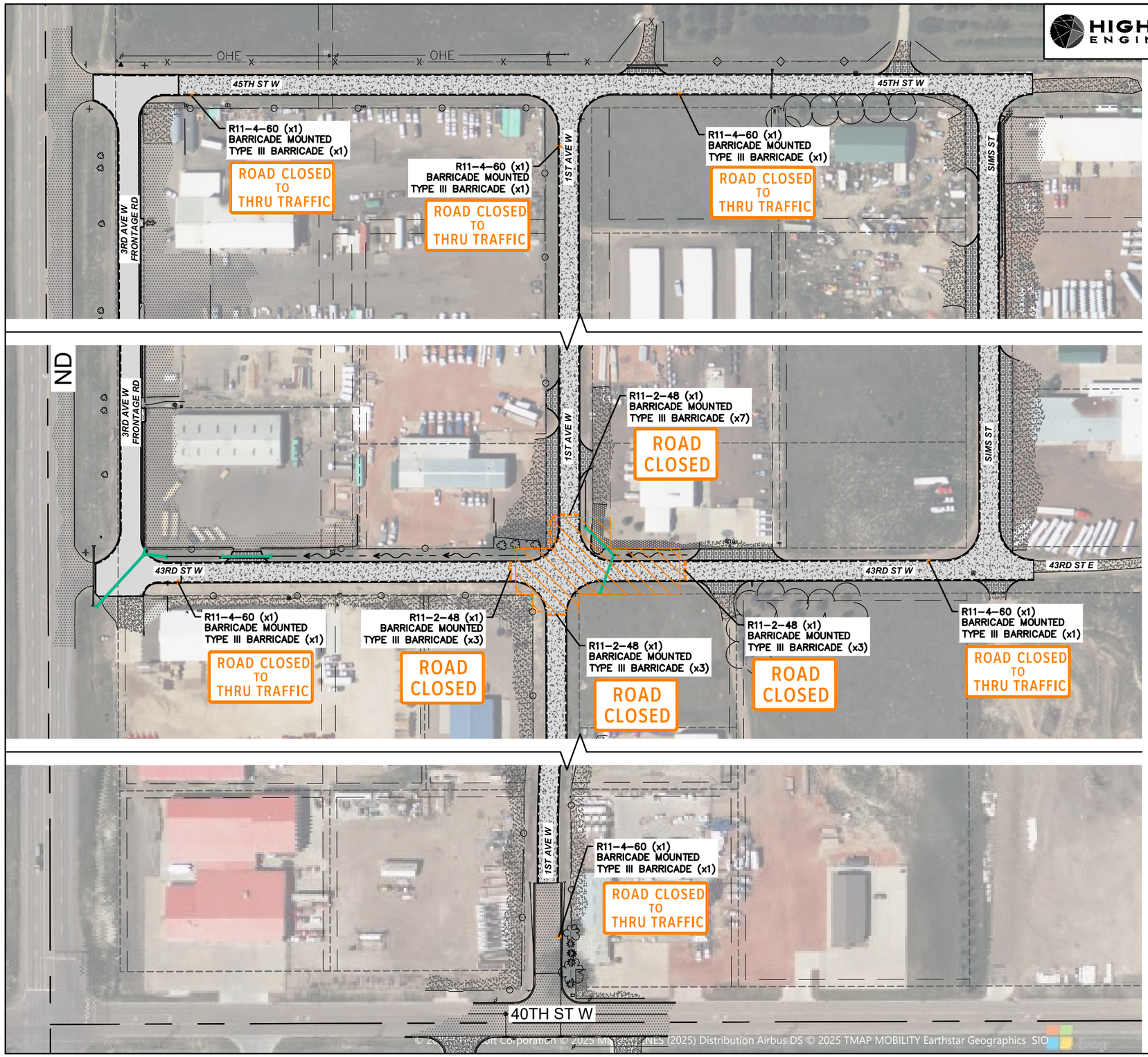
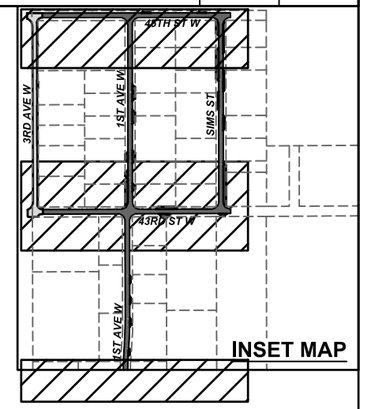
WORK ZONE TRAFFIC CONTROL
PHASE 1

NORTH INDUSTRIES STREETS
AND STORMWATER
DICKINSON, ND

3/10/2025 4:08:15 PM schrank H:\231223\PROJECT CAD\CURRENT\231223_100WZ_001_trafficctrl.dwg

HIGHLANDS ENGINEERING	PROJECT NO.	SECTION NO.	SHEET NO.
	CITY: 202316 / HE: 231223	100	3





N
W E
S

0 150' 300'

SCALE: 1" = 150'

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WORK ZONE TRAFFIC CONTROL
PHASE 2

NORTH INDUSTRIES STREETS
AND STORMWATER
DICKINSON, ND

3/10/2025 4:08:15 PM schrank H:\231223\PROJECT CAD\CURRENT\231223_100WZ_001_trafficctrl.dwg

HIGHLANDS ENGINEERING	PROJECT NO.	SECTION NO.	SHEET NO.
	CITY: 202316 / HE: 231223	190	1

N
W E
S

40TH ST W
21ST ST W
3RD AVE W
10TH AVE E
I-94
STATE AVE
WEST I-94 BUSINESS LOOP
VILLARD ST
ENERGY DR
CITY BAILER BUILDING
6TH AVE E
6TH ST S
LEHIGH RD
CITY LANDFILL SITE

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LEGEND

PROJECT LOCATION

PRE-APPROVED HAUL ROADS

PRE-APPROVED HAUL ROADS

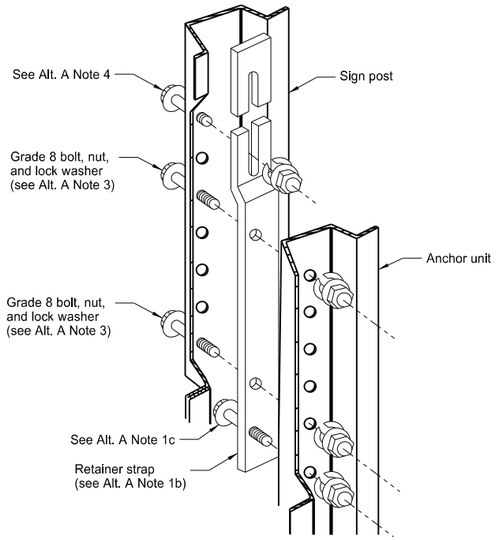
NORTH INDUSTRIES STREETS AND STORMWATER
DICKINSON, ND

3/11/2025 12:56:19 PM schrank H:\231223\PROJECT CAD\CURRENT\231223_190HR_001_haulroads.dwg

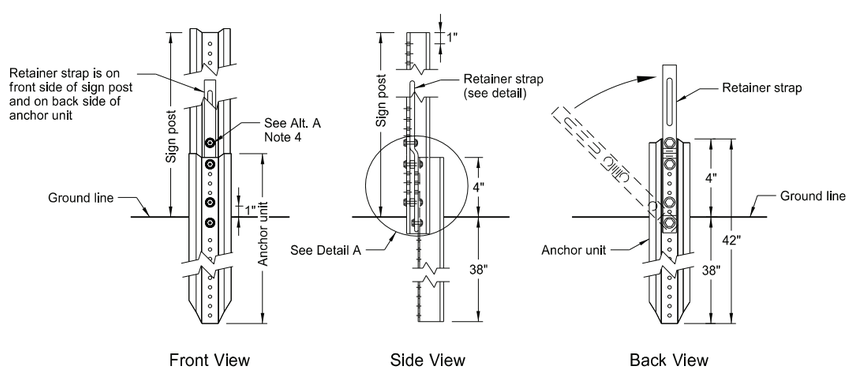
BREAKAWAY SYSTEMS FOR CONSTRUCTION ZONE SIGNS

D-704-8

U-Channel Post



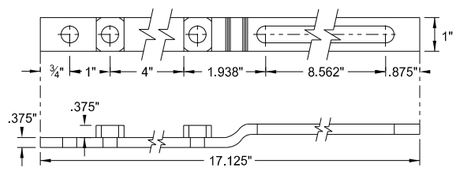
Detail A



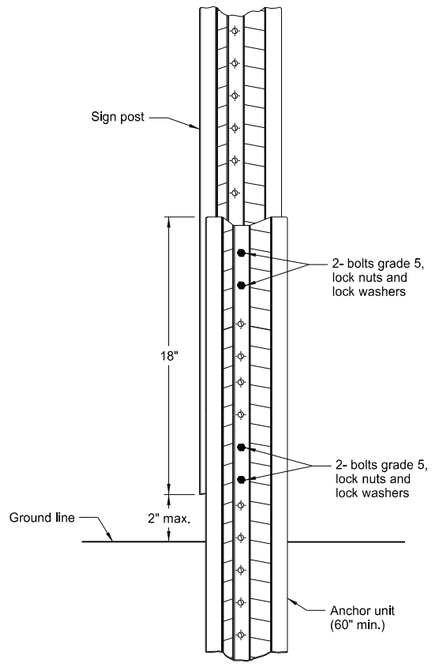
Front View | Side View | Back View

Breakaway U-Channel Detail Alternate A

Install a maximum of 2 posts within 7'.

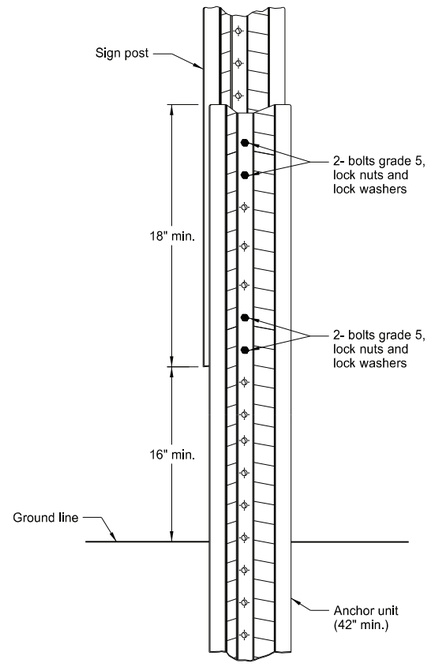


Retainer Strap Detail



Breakaway U-Channel Splice Detail Alternate B (2.5 and 3 lb/ft)

Install a maximum of 3 posts within 7'.



Breakaway U-Channel Splice Detail Alternate C (2.5 and 3 lb/ft)

Install a maximum of 3 posts within 7'.

Alternate A Steps of Installation:

1. a) Drive anchor unit to within 12" of ground level.
   b) Establish proper assembly by lining up bottom hole of retainer strap with 6th hole from the top of the anchor unit.
   c) Assemble strap to back of anchor unit using 5/16"x2" bolt, lock washer and nut.
   d) Rotate strap 90° to left.
2. a) Drive anchor unit to 4" above ground.
   b) Rotate strap to vertical position.
3. a) Place 5/16"x2" bolt, lock washer and nut in bottom of sign post to facilitate alignment of sign post with proper hole in anchor unit.
   b) Alternately tighten two connector bolts.
4. Complete assembly by tightening 5/16"x2" bolt (this fastens sign post to retainer strap).
5. Properly nest base post, strap, and sign post. Proper nesting occurs when all flat surfaces of the base post, strap, and sign post at the bolts have full contact across the entire width.

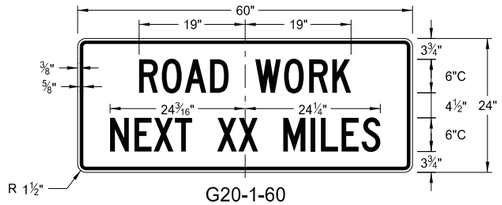
NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
2-28-14	
REVISIONS	
DATE	CHANGE
9-27-17	Updated to active voice
10-03-19	New Design Engr PE Stamp
8-01-24	Electronic Stamp/Signature

KIRK J. HOFF
REGISTERED
PROFESSIONAL
PE-4683
ENGINEER
NORTH DAKOTA

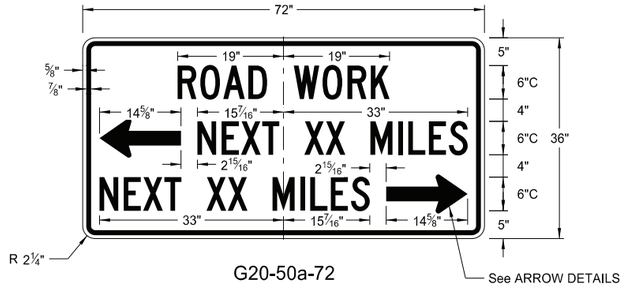
08/01/24

CONSTRUCTION SIGN DETAILS
TERMINAL AND GUIDE SIGNS

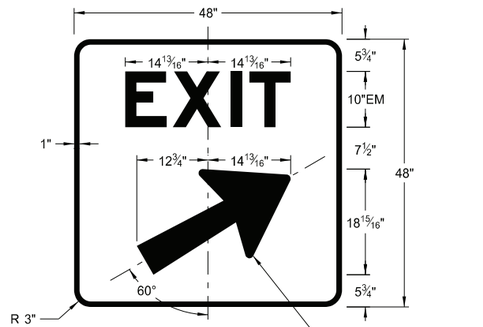
D-704-9



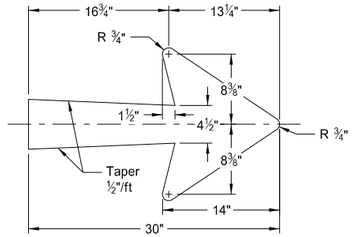
G20-1-60
Legend: black (non-refl)
Background: orange



G20-50a-72
Legend: black (non-refl)
Background: orange

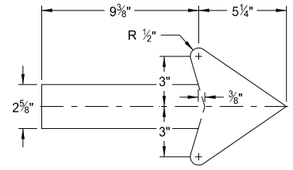


E5-1(L or R)-48
Legend: white
Background: green (orange optional)

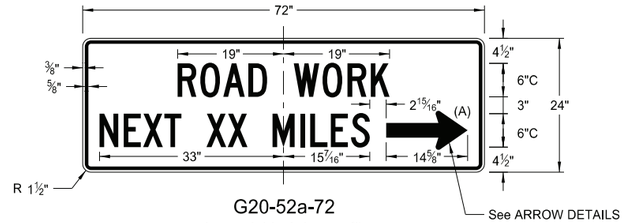


E5-1-48

G20-1b-60
Legend: black (non-refl)
Background: orange



G20-50a-72
G20-52a-72



G20-52a-72
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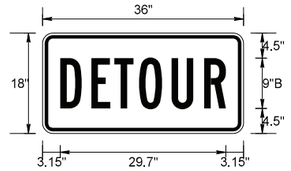
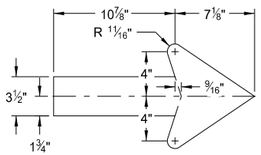
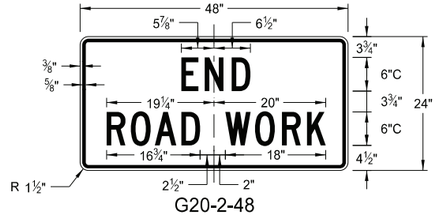
Background: orange



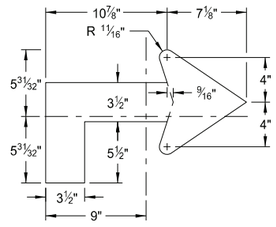
M4-8-36
Legend: black (non-refl)
Background: orange



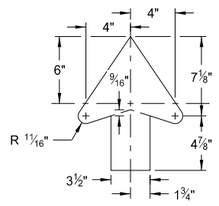
M4-9(L or R)-30
Right or Left



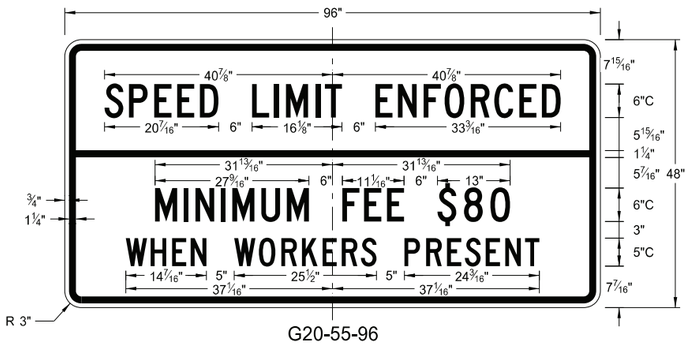
G20-2-48
Legend: black (non-refl)
Background: orange



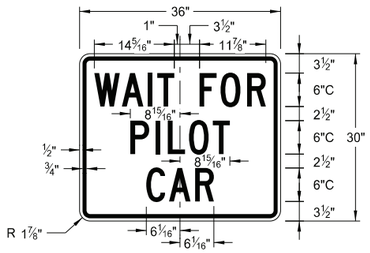
M4-9(L or R)-30
Advanced Right or Left



M4-9-30
Straight



G20-55-96
Legend: black (non-refl)
Background: orange



G20-4b-36
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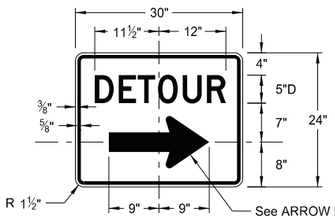
Background: orange



M4-9(L or R)-30 &
M4-9-30
Legend: black (non-refl)
Background: orange

ARROW DETAILS

NOTES:

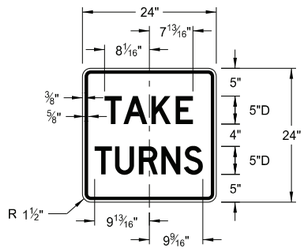
(A) Arrow may be right or left of the legend to indicate construction to the right or left.

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
8-13-13	
REVISIONS	
DATE	CHANGE
8-17-17	Added sign & background color
10-03-19	New Design Engineer PE Stamp
8-01-24	Electronic Stamp/Signature

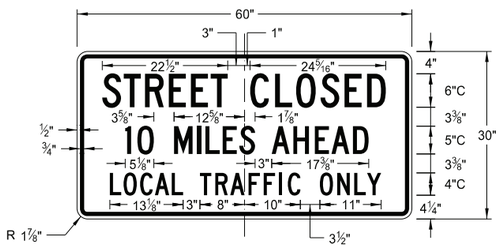
KIRK J. HOFF
REGISTERED
PROFESSIONAL
PE-4683
ENGINEER
NORTH DAKOTA

08/01/24

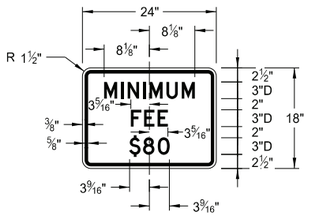
CONSTRUCTION SIGN DETAILS
REGULATORY SIGNS



R1-50P-24
Legend: black (non-refl)
Background: white



R11-3c-60
Legend: black (non-refl)
Background: white



R2-1aP-24
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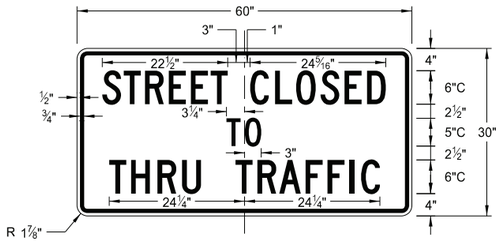
Background: white



R11-4a-60
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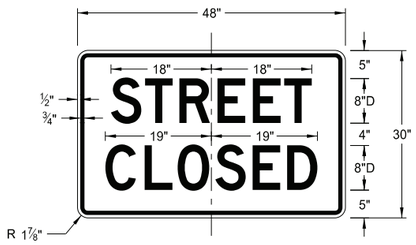
Background: white



R11-2a-48
Legend: black (non-refl)
Background: white

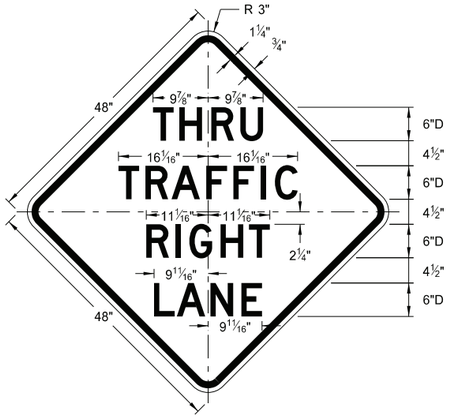
NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
8-13-13	
REVISIONS	
DATE	CHANGE
8-17-17	Revised sign number
10-03-19	New Design Engineer PE Stamp
8-01-24	Electronic Stamp/Signature

KIRK J. HOFF
REGISTERED
PROFESSIONAL
PE-4683
ENGINEER
NORTH DAKOTA

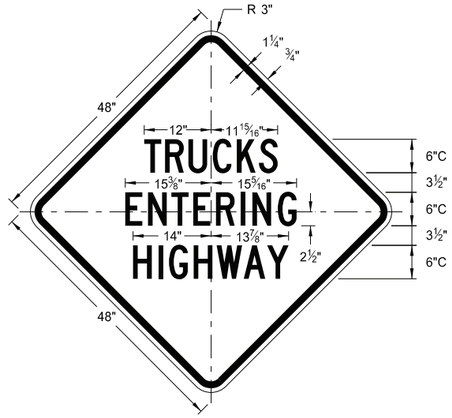
08/01/24

CONSTRUCTION SIGN DETAILS
WARNING SIGNS

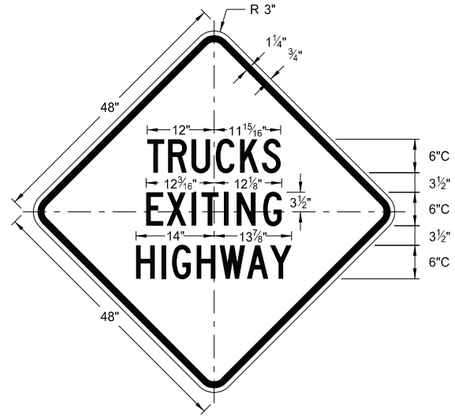
D-704-11



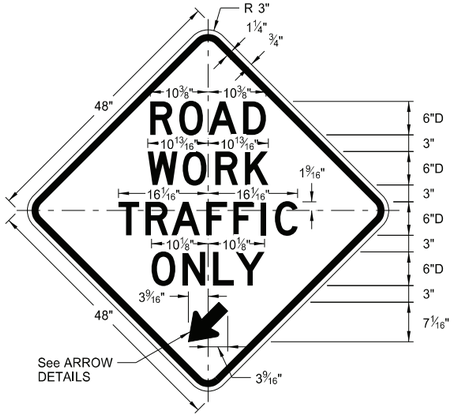
W5-8-48
Legend: black (non-refl)
Background: orange



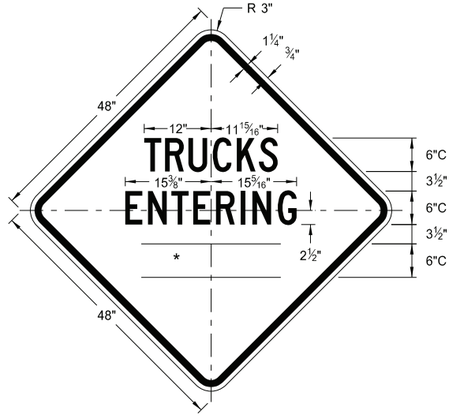
W8-53-48
Legend: black (non-refl)
Background: orange



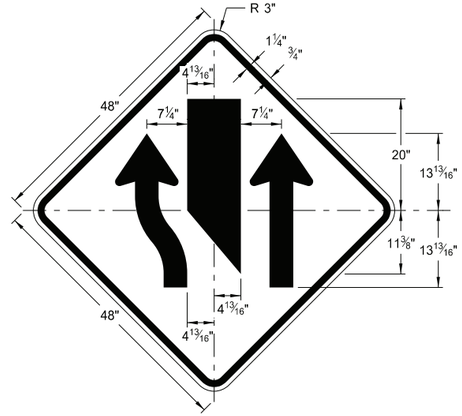
W8-56-48
Legend: black (non-refl)
Background: orange



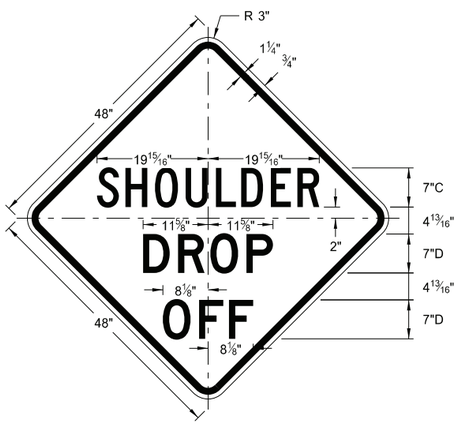
W5-9-48
Legend; black (non-refl)
Background: orange



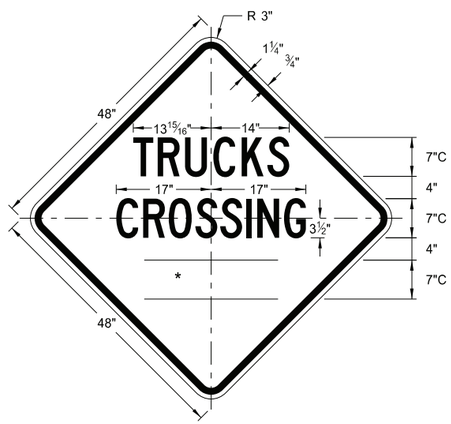
W8-54-48
Legend; black (non-refl)
Background: orange



W9-3a-48
Legend; black (non-refl)
Background: orange



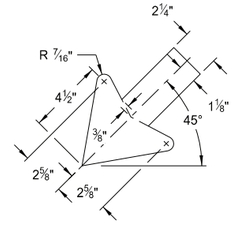
W8-9a-48
Legend: black (non-refl)
Background: orange



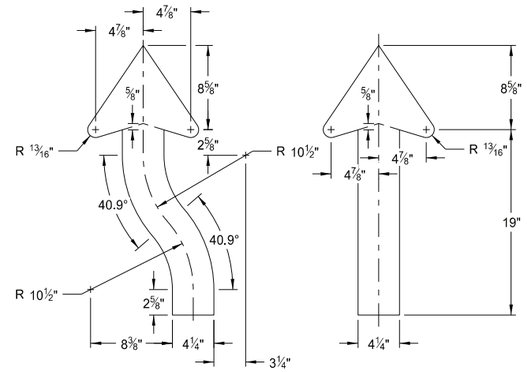
W8-55-48
Legend: black (non-refl)
Background: orange

WORD	LETTER SPACING
AHEAD	Standard
200 FT	Standard
350 FT	Standard
500 FT	Standard
1000 FT	Reduce 40%
1500 FT	Reduce 40%
½ MILE	Reduce 50%
1 MILE	Standard

* DISTANCE MESSAGES



W5-9-48



W9-3a-48

ARROW DETAILS

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
8-13-13	
REVISIONS	
DATE	CHANGE
8-17-17	Updated sign number
5-31-18	Revised sign and arrow details
10-03-19	New Design Engineer PE Stamp
8-01-24	Electronic Stamp/Signature

KIRK J. HOFF
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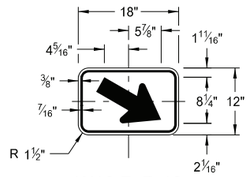
PROFESSIONAL
PE-4683
ENGINEER
NORTH DAKOTA

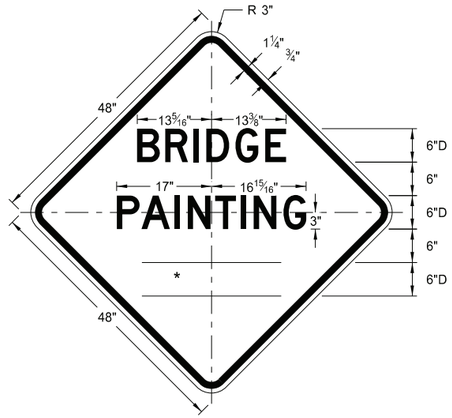
08/01/24

CONSTRUCTION SIGN DETAILS
WARNING SIGNS

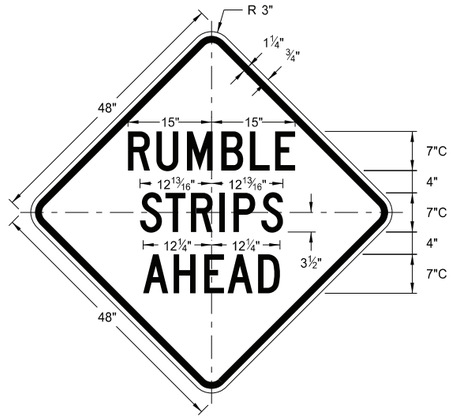
D-704-11A



W16-7aP-18
Legend: black (non-refl)
Background: orange



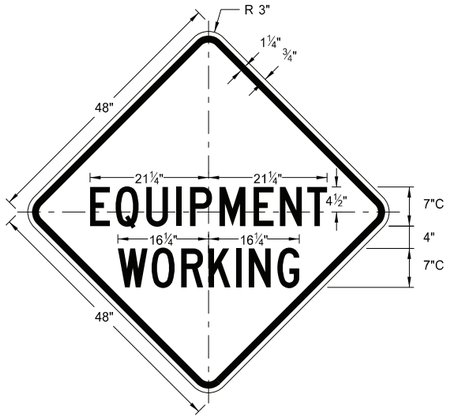
W21-50-48
Legend: black (non-refl)
Background: orange



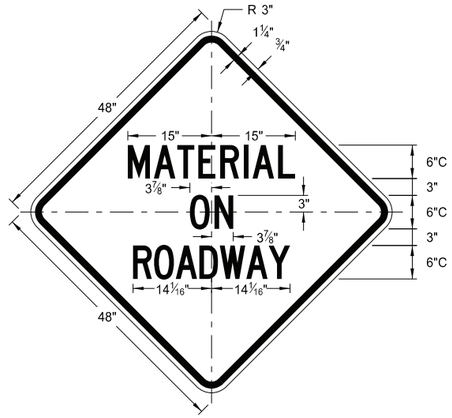
W21-53-48
Legend: black (non-refl)
Background: orange

WORD	LETTER SPACING
AHEAD	Standard
200 FT	Standard
350 FT	Standard
500 FT	Standard
1000 FT	Reduce 40%
1500 FT	Reduce 40%
½ MILE	Reduce 50%
1 MILE	Standard

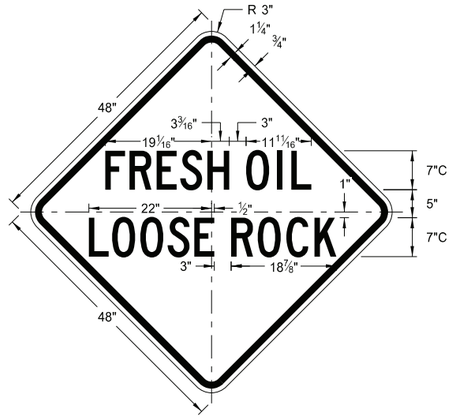
* DISTANCE MESSAGES



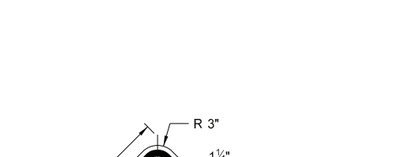
W20-51-48
Legend: black (non-refl)
Background: orange



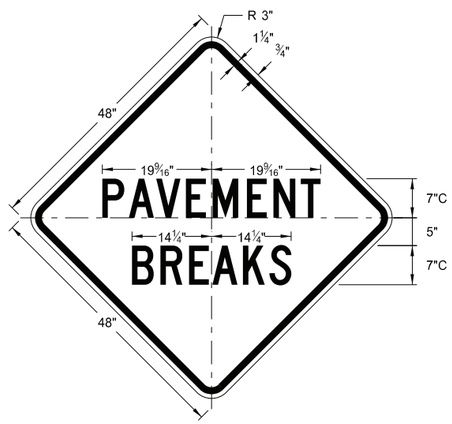
W21-51-48
Legend: black (non-refl)
Background: orange



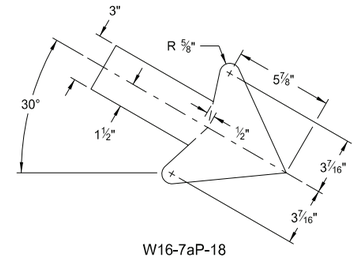
W22-8-48
Legend: black (non-refl)
Background: orange



W20-52P-54
Legend: black (non-refl)
Background: orange



W21-52-48
Legend: black (non-refl)
Background: orange



W16-7aP-18

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
5-31-18	
REVISIONS	
DATE	CHANGE
11-01-19	Added details for sign W16-7aP-18.
8-01-24	Electronic Stamp/Signature.

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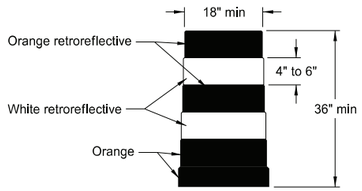
08/01/24

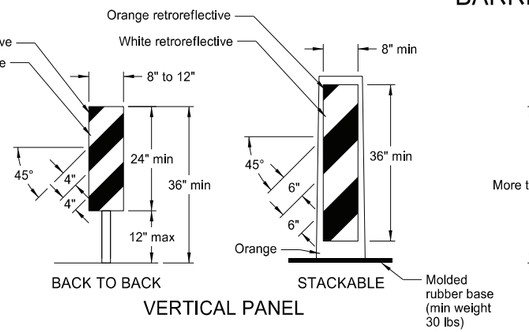
BARRICADE AND CHANNELIZING DEVICE DETAILS

D-704-13



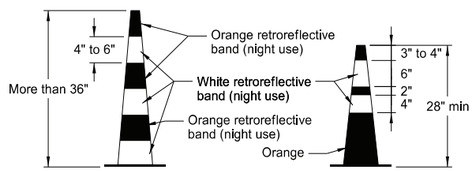
DELINEATOR DRUM

Provide horizontal, circumferential, alternating orange and white retroreflective stripes 4" to 6" wide for drum markings. Use a minimum of two orange and two white stripes with the top stripe being orange for each drum. Do not exceed 3" nonretroreflectorized spaces between the horizontal orange and white stripes. Avoid placement of stripes on drum ribs or indentations. Use closed top drums that will not allow collection of debris. Do not place ballast on the top of drum.



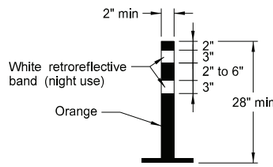
VERTICAL PANEL

Provide alternating orange and white retroreflective stripes, sloping downward in direction vehicular traffic is to pass. Place retroreflective sheeting on both sides of panel with a minimum of 270 square inches of retroreflective area facing vehicular traffic. Where the height of the retroreflective material on the vertical panel is 36 inches or more, use a stripe width of 6 inches.



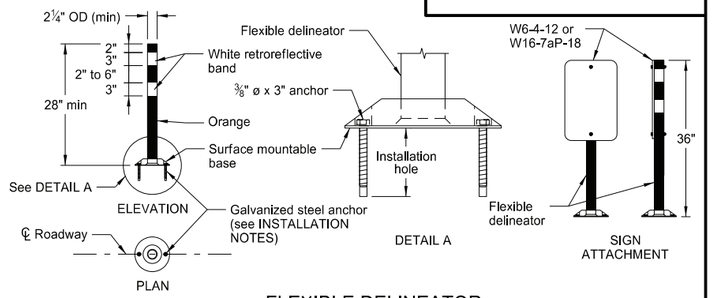
TRAFFIC CONE

Provide retroreflectorization of cones more than 36" in height by alternating orange and white retroreflective stripes. Use a minimum of two orange and two white stripes for each cone with the top stripe being orange. Use maximum 3" nonretroreflectorized space between the orange and white stripes.



TUBULAR MARKER

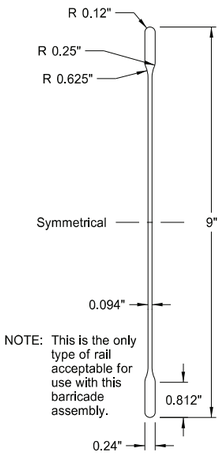
Provide retroreflectorization of tubular markers more than 42" in height by alternating four 4" to 6" wide orange and white stripes with the top stripe being orange.



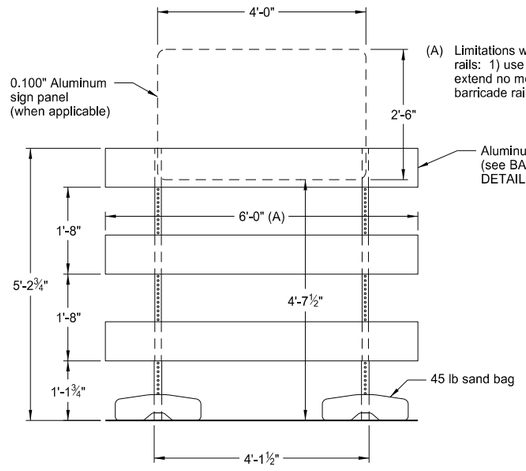
FLEXIBLE DELINEATOR

INSTALLATION NOTES:

1. Drill installation holes to diameter and depth required by manufacturer's specifications.
2. For removal, remove anchors and fill installation hole with an epoxy designed to bond to pavement surface.
3. In lieu of bolted down base, use an 8" x 8" butyl pad or hot melt butyl. Remove butyl as close as possible to pavement surface.

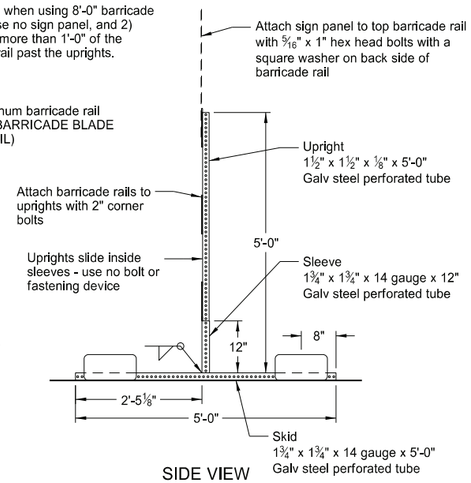


BARRICADE BLADE DETAIL



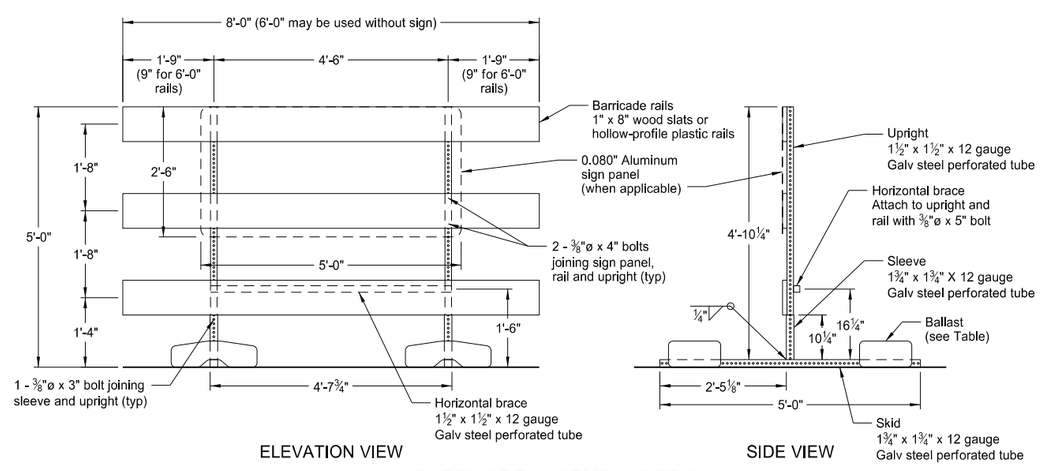
ELEVATION VIEW

(A) Limitations when using 8'-0" barricade rails: 1) use no sign panel, and 2) extend no more than 1'-0" of the barricade rail past the uprights.



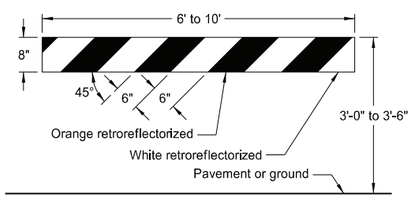
SIDE VIEW

BARRICADE ASSEMBLY DETAIL (Aluminum Barricade Rails)

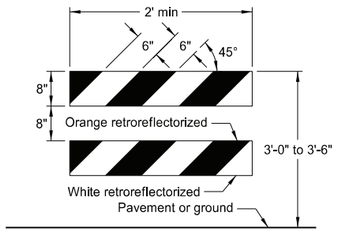


BARRICADE ASSEMBLY DETAIL (Wood or Plastic Rails)

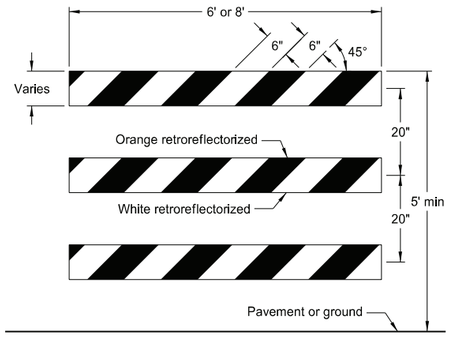
NOTE: For barricade markings use alternating orange and white retroreflective stripes, sloping downward in the direction traffic is to pass. Place retroreflective sheeting on both sides of the rails with a minimum of 270 square inches of visible retroreflective area facing vehicular traffic. When the barricade length is less than 36", use a rail stripe width of 4".



TYPE I BARRICADE

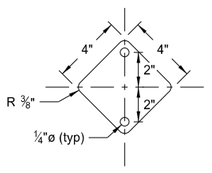


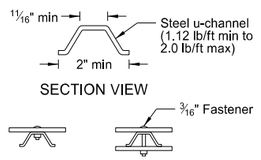
TYPE II BARRICADE

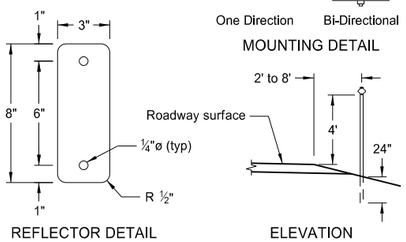


TYPE III BARRICADE

BARRICADE RAIL DETAILS







DELINEATORS

MINIMUM BALLAST
(For each side of barricade support)

Without Sign	4 - 25 lb sandbags
With Sign	6 - 25 lb sandbags

Note: Number of sandbags based on a wind speed of 55 MPH. Sandbags assumed to be placed at or near the ends of the skids.

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
10-3-13	
REVISIONS	
DATE	CHANGE
9-27-17	Updated to active voice
11-01-19	Revised details for Flexible Delineator
8-01-24	Electronic Stamp/Signature

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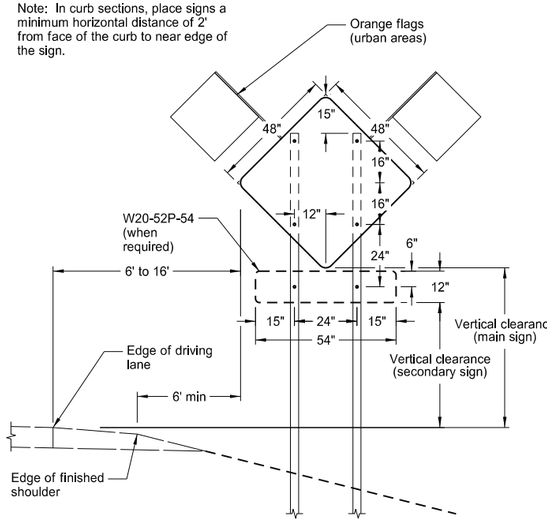
ENGINEER
NORTH DAKOTA

08/01/24

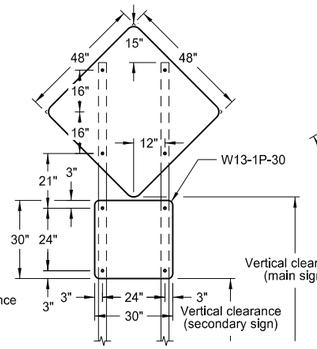
CONSTRUCTION SIGN PUNCHING AND MOUNTING DETAILS

D-704-14

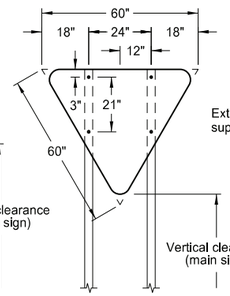
Note: In curb sections, place signs a minimum horizontal distance of 2' from face of the curb to near edge of the sign.



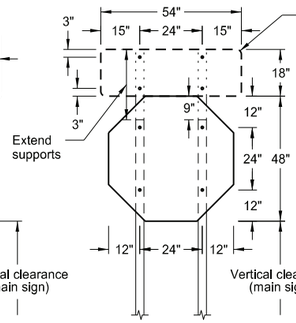
TYPICAL SECTION
(48" x 48" diamond warning sign shown)



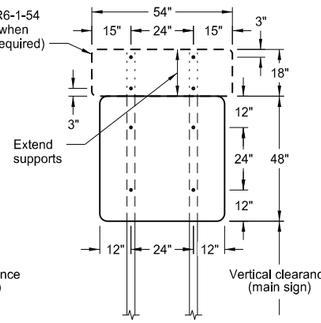
48" x 48" DIAMOND SIGN
(with 30" x 30" secondary sign)



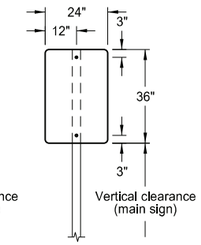
R1-2-60 - YIELD SIGN



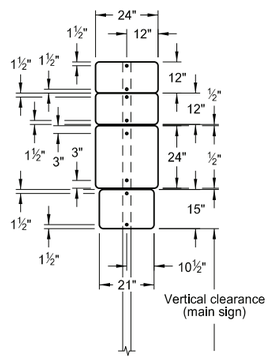
R1-1-48 - STOP SIGN
(with R6-1-54 sign as required)



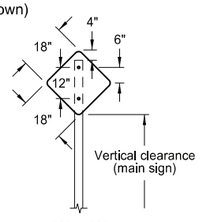
48" x 48" SIGN
(with R6-1-54 sign as required)



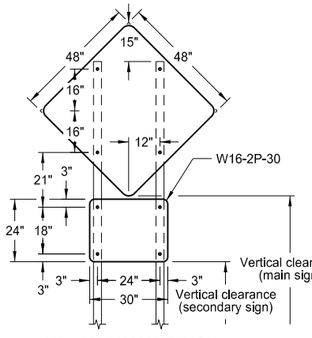
24" x 36" SIGN



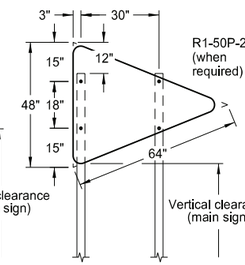
24" x 24"
ROUTE MARKER
ASSEMBLY



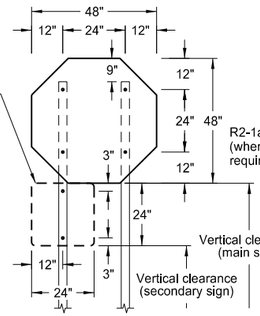
18" x 18"
DIAMOND SIGN



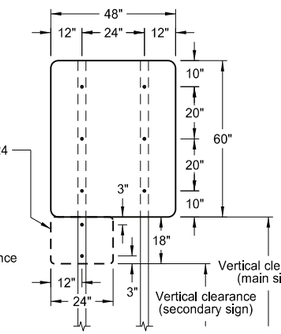
48" x 48" DIAMOND SIGN
(with 30" x 24" secondary sign)



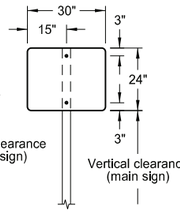
W14-3-64 - PENNANT SIGN



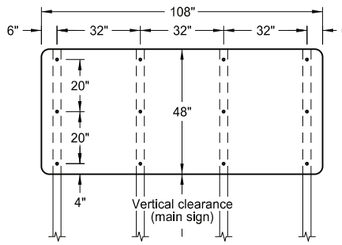
R1-1-48 - STOP SIGN
(with R1-50P-24 sign as required)



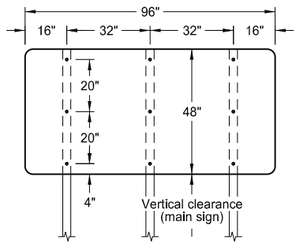
48" x 48" SIGN
(with R2-1aP-24 sign as required)



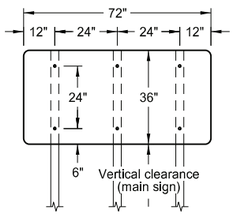
30" x 24" SIGN



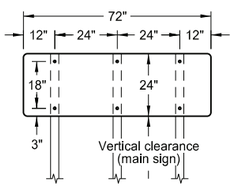
108" x 48" SIGN



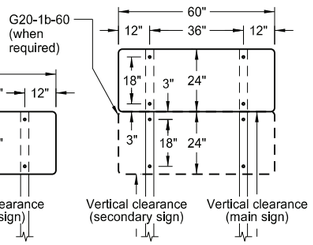
96" x 48" SIGN



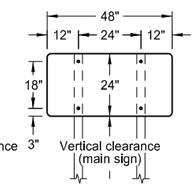
72" x 36" SIGN



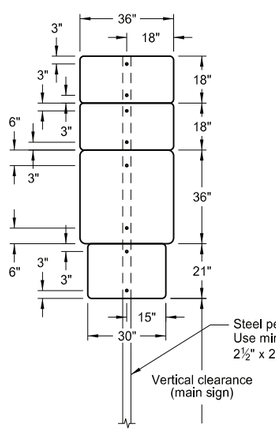
72" x 24" SIGN



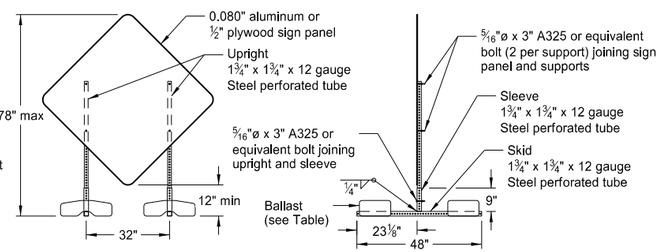
60" x 24" SIGN



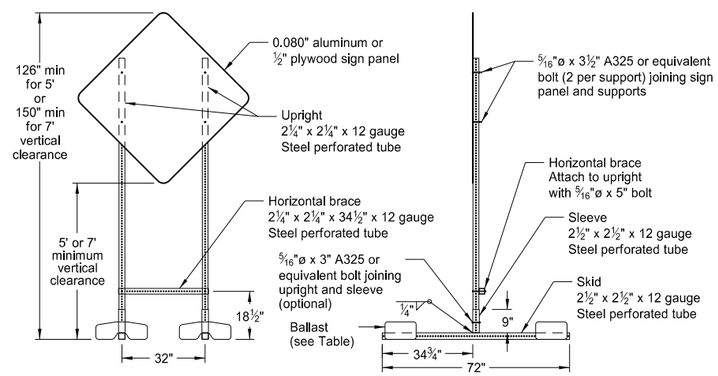
48" x 24" SIGN



36" x 36"
ROUTE MARKER
ASSEMBLY



PORTABLE SIGN SUPPORT
LOW-MOUNTING HEIGHT



PORTABLE SIGN SUPPORT
HIGH-MOUNTING HEIGHT

NOTES:

1. Sign Supports: Galvanize or paint supports. Minimum post sizes are 2.5 lb/ft u-channel or 2" x 2" x 12 gauge steel perforated tube, except where noted. When installing signs on u-channel, minimum post size for assemblies containing a secondary sign is 3.0 lb/ft. Post sizes based on a wind speed of 55 MPH.

   Place signs over 50 square feet on 2½" x 2½" perforated tube supports as a minimum.

   Do not attach guy wires to sign supports. Attach wind beams behind sign panels when used with u-posts.

2. Sign Panels: Provide sign panels made of 0.100" aluminum, ½" plywood, or other approved material, except where noted. Punch all holes round for ⅜" bolts.

3. Alternate Messages: Install and remove alternate message signs on reflectorized plate (without borders) as required. (i.e. "Left" and "Right" message on lane closure sign)

4. Route Marker Auxiliary Signs: Provide route marker auxiliary signs, such as the cardinal direction and directional arrows, with a background and legend that match the route marker they are used with:

   Interstate - white legend on blue background
   Interstate Business Loop - white legend on green background
   US and State - black legend on white background
   County - yellow legend on blue background

5. Vertical Clearance: Install signs with a vertical clearance of 5'-0" (see TYPICAL SECTION.) In areas where parking or pedestrian movements are likely or the view of the sign may be obstructed, install signs with a vertical clearance of 7'-0" from the top of the curb or from the near edge of the driving lane in absence of a curb.

   The vertical clearance to secondary signs is 1'-0" less than the vertical clearance stated above.

   Provide a minimum clearance of 7'-0" from the ground at the post for signs with an area exceeding 50 square feet.

6. Portable Signs: Provide portable signs that meet the vertical clearance stated above when it is necessary to place signs within the pavement surface.

   Use of low-mounting height (minimum 12" vertical clearance) portable signs for 5 days or less, is allowed as long as the view of the sign is not obstructed. Time delays caused by unforseen circumstances, such as equipment breakdown, rain, subgrade failures, etc., will not accrue towards the 5 day period. Use of R9-8 through R9-11a series, W1-6 through W1-8 series, M4-10, and E5-1 is allowed for longer than 5 days.

   Restrict signs mounted on portable sign supports shown in the LOW-MOUNTING HEIGHT and HIGH-MOUNTING HEIGHT details to a maximum surface area of 16 square feet.

MINIMUM BALLAST
(For each side of sign support base)

Sign Panel Mounting Height (ft)	Number of 25 lb sandbags for 4' x 4' sign panel
1'	6
5'	8
7'	10

Note: The number of sandbags are based on a wind speed of 55 MPH. Place sandbags at or near the ends of skids.

NORTH DAKOTA
DEPARTMENT OF TRANSPORTATION

10-4-13

REVISIONS

DATE	CHANGE
11-14-13	Revised Note 6
9-27-17	Updated to active voice
11-01-19	Revised 60"x24" sign detail
8-01-24	Electronic Stamp/Signature

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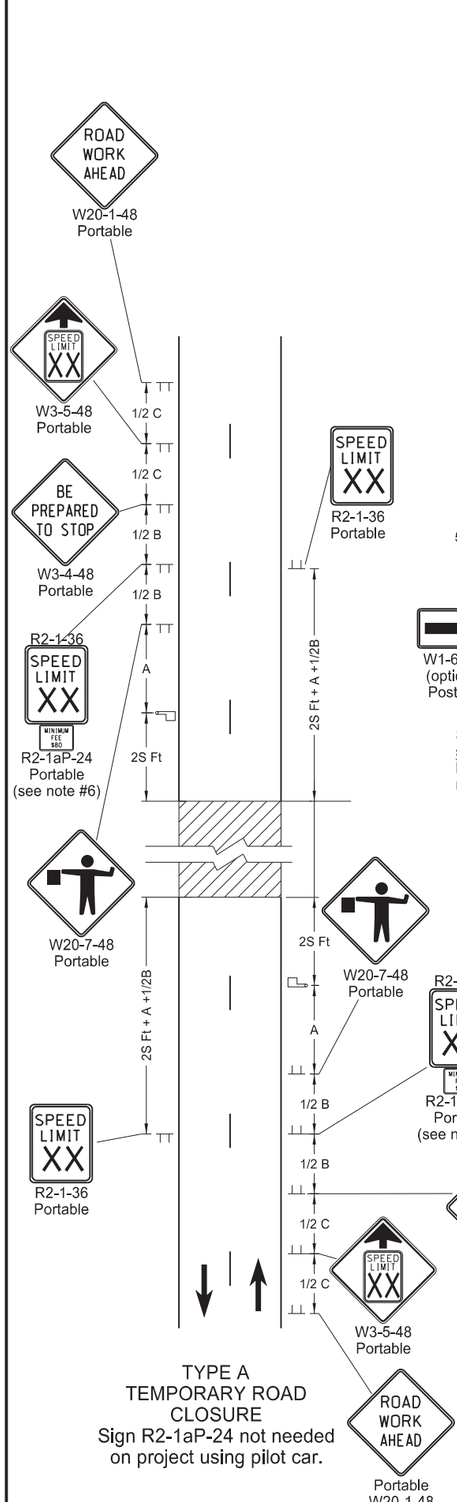
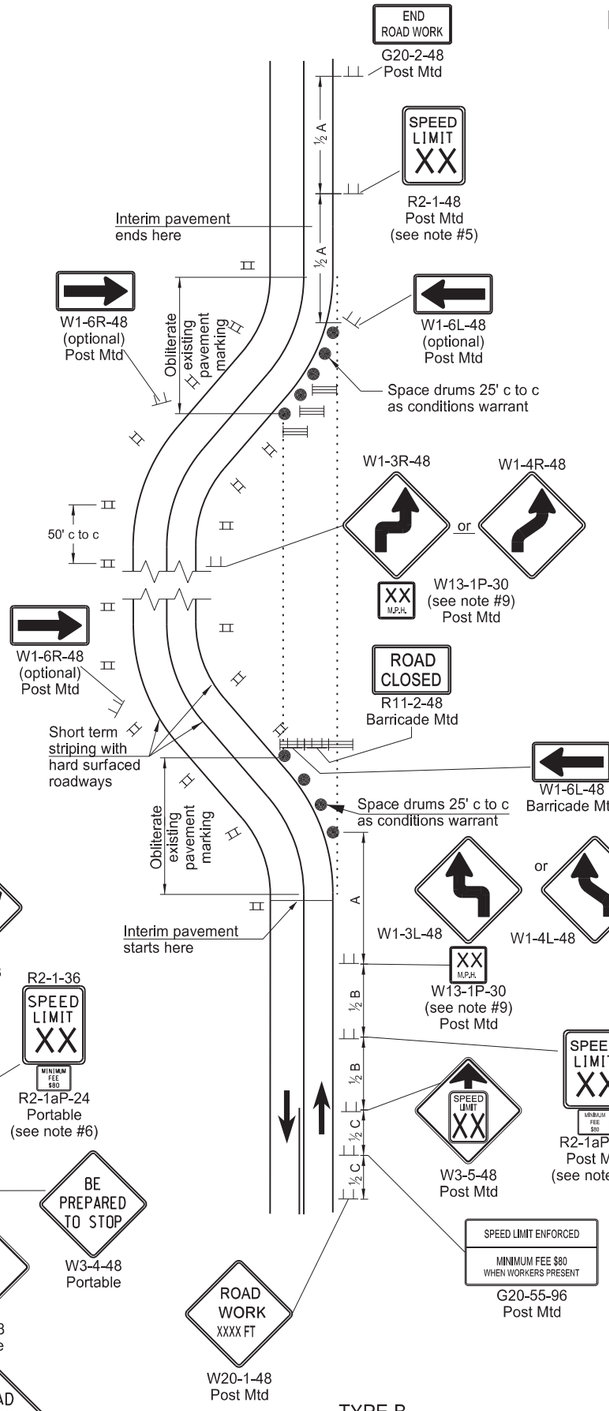
08/01/24

ROAD CLOSURE LAYOUTS

D-704-15

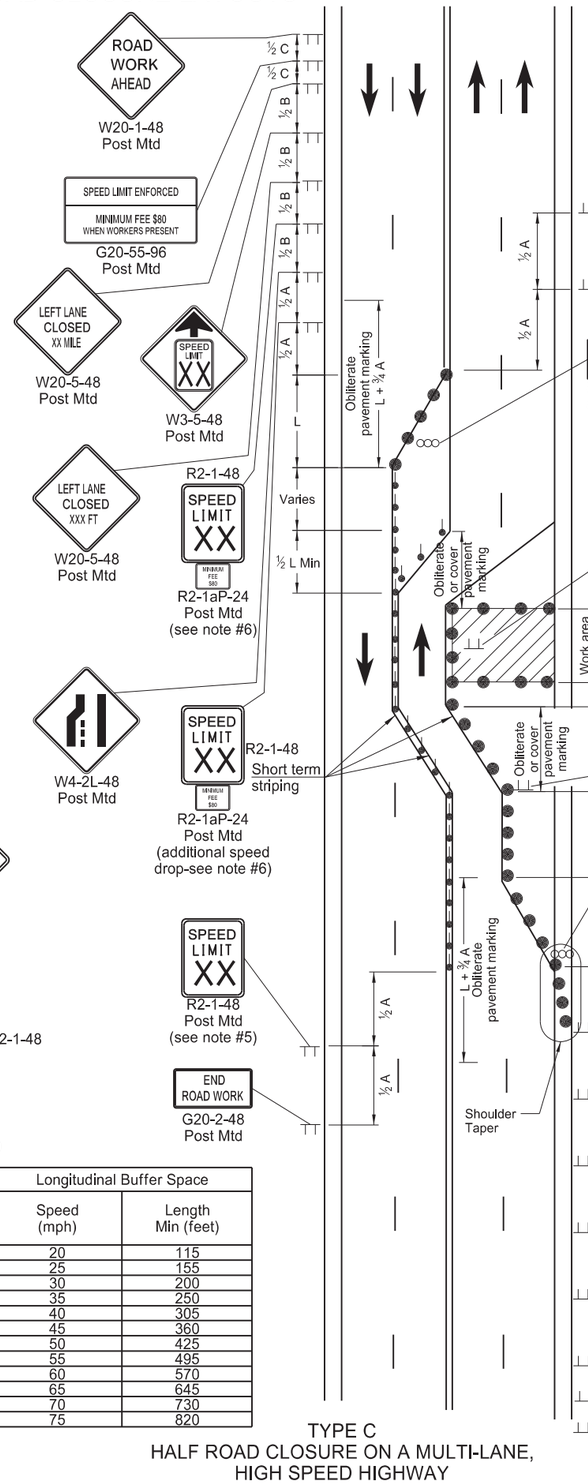


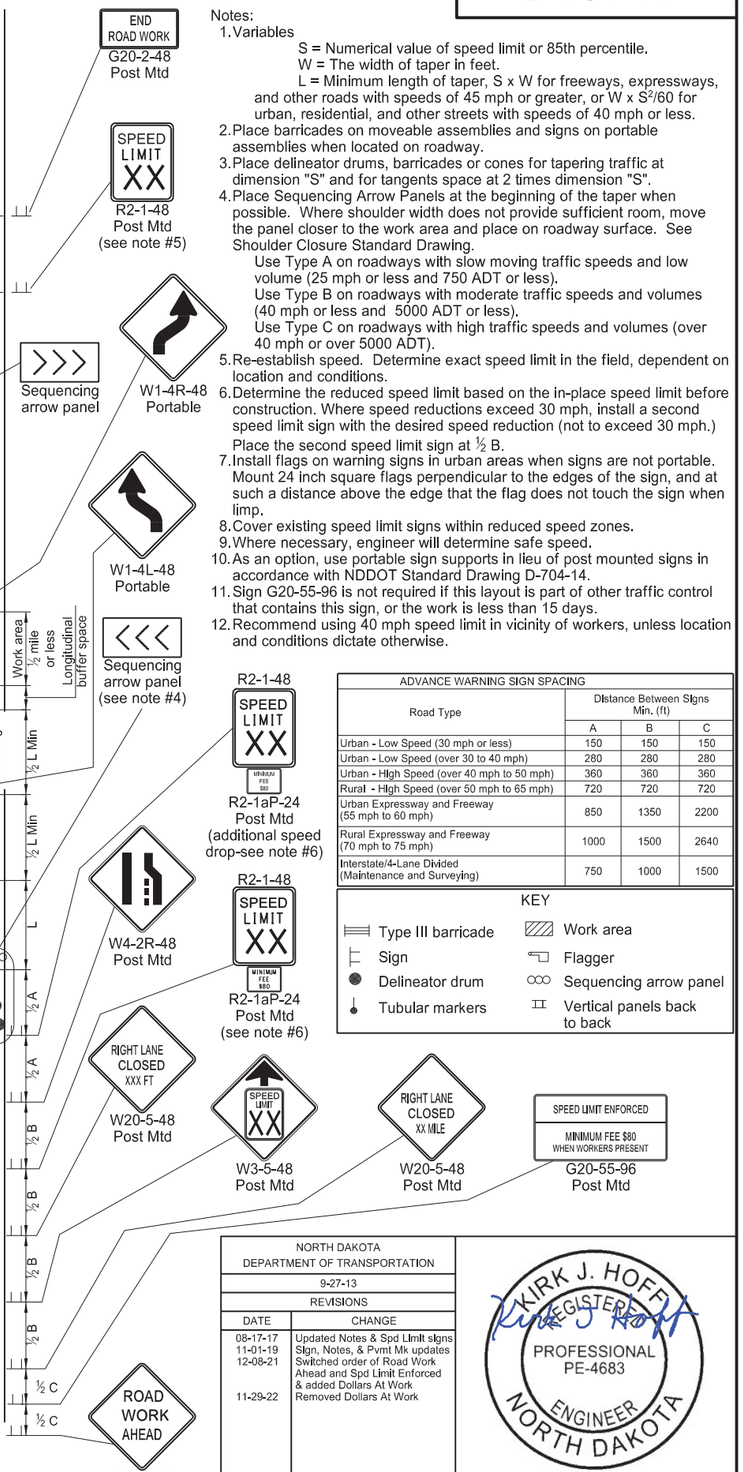
TYPE A
TEMPORARY ROAD CLOSURE
Sign R2-1aP-24 not needed on project using pilot car.



TYPE B
ROAD CLOSURE WITH A DIVERSION
Two lane highway where roadway is closed and detour provided (signing shown for one direction only). Use on bridge and culvert installation with ½ mile or less closure.

Longitudinal Buffer Space	
Speed (mph)	Length Min (feet)
20	115
25	155
30	200
35	250
40	305
45	360
50	425
55	495
60	570
65	645
70	730
75	820





TYPE C
HALF ROAD CLOSURE ON A MULTI-LANE, HIGH SPEED HIGHWAY
4 lane undivided highway with half the roadway closed.

Notes:
1. Variables
   S = Numerical value of speed limit or 85th percentile.
   W = The width of taper in feet.
   L = Minimum length of taper, S x W for freeways, expressways, and other roads with speeds of 45 mph or greater, or W x S^2/60 for urban, residential, and other streets with speeds of 40 mph or less.
2. Place barricades on moveable assemblies and signs on portable assemblies when located on roadway.
3. Place delineator drums, barricades or cones for tapering traffic at dimension "S" and for tangents space at 2 times dimension "S".
4. Place Sequencing Arrow Panels at the beginning of the taper when possible. Where shoulder width does not provide sufficient room, move the panel closer to the work area and place on roadway surface. See Shoulder Closure Standard Drawing.
   Use Type A on roadways with slow moving traffic speeds and low volume (25 mph or less and 750 ADT or less).
   Use Type B on roadways with moderate traffic speeds and volumes (40 mph or less and 5000 ADT or less).
   Use Type C on roadways with high traffic speeds and volumes (over 40 mph or over 5000 ADT).
5. Re-establish speed. Determine exact speed limit in the field, dependent on location and conditions.
6. Determine the reduced speed limit based on the in-place speed limit before construction. Where speed reductions exceed 30 mph, install a second speed limit sign with the desired speed reduction (not to exceed 30 mph.) Place the second speed limit sign at ½ B.
7. Install flags on warning signs in urban areas when signs are not portable. Mount 24 inch square flags perpendicular to the edges of the sign, and at such a distance above the edge that the flag does not touch the sign when limp.
8. Cover existing speed limit signs within reduced speed zones.
9. Where necessary, engineer will determine safe speed.
10. As an option, use portable sign supports in lieu of post mounted signs in accordance with NDDOT Standard Drawing D-704-14.
11. Sign G20-55-96 is not required if this layout is part of other traffic control that contains this sign, or the work is less than 15 days.
12. Recommend using 40 mph speed limit in vicinity of workers, unless location and conditions dictate otherwise.

ADVANCE WARNING SIGN SPACING			
Road Type	Distance Between Signs Min. (ft)		
	A	B	C
Urban - Low Speed (30 mph or less)	150	150	150
Urban - Low Speed (over 30 to 40 mph)	280	280	280
Urban - High Speed (over 40 mph to 50 mph)	360	360	360
Rural - High Speed (over 50 mph to 65 mph)	720	720	720
Urban Expressway and Freeway (55 mph to 60 mph)	850	1350	2200
Rural Expressway and Freeway (70 mph to 75 mph)	1000	1500	2640
Interstate/4-Lane Divided (Maintenance and Surveying)	750	1000	1500

KEY
- Type III barricade
- Sign
- Delineator drum
- Tubular markers
- Work area
- Flagger
- Sequencing arrow panel
- Vertical panels back to back

NORTH DAKOTA
DEPARTMENT OF TRANSPORTATION

9-27-13

REVISIONS

DATE	CHANGE
08-17-17	Updated Notes & Spd Limit signs
11-01-19	Sign, Notes, & Pvmt Mk updates
12-08-21	Switched order of Road Work Ahead and Spd Limit Enforced & added Dollars At Work
11-29-22	Removed Dollars At Work

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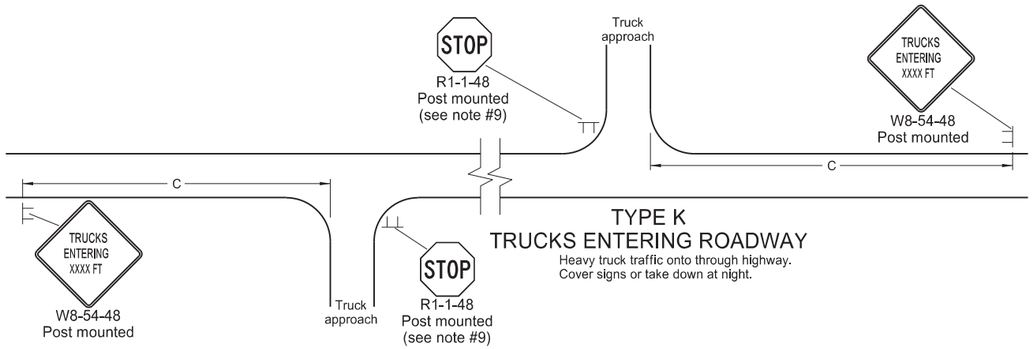
11/29/22

CONSTRUCTION TRUCK AND TEMPORARY DETOUR LAYOUTS

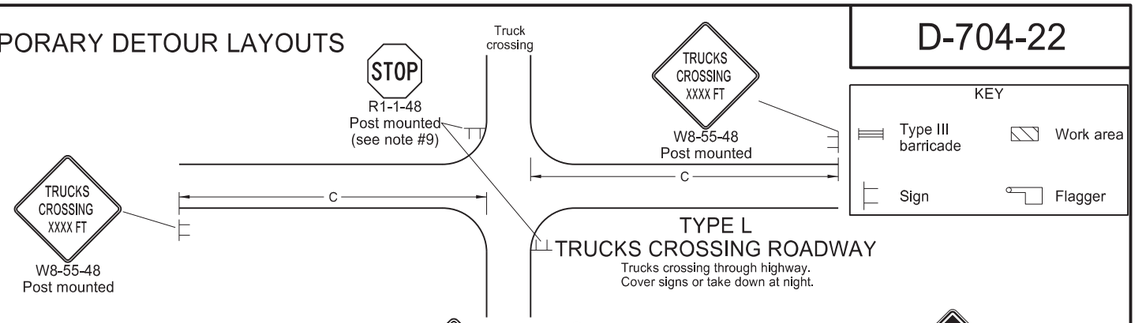
D-704-22

KEY
- Type III barricade
- Work area
- Sign
- Flagger



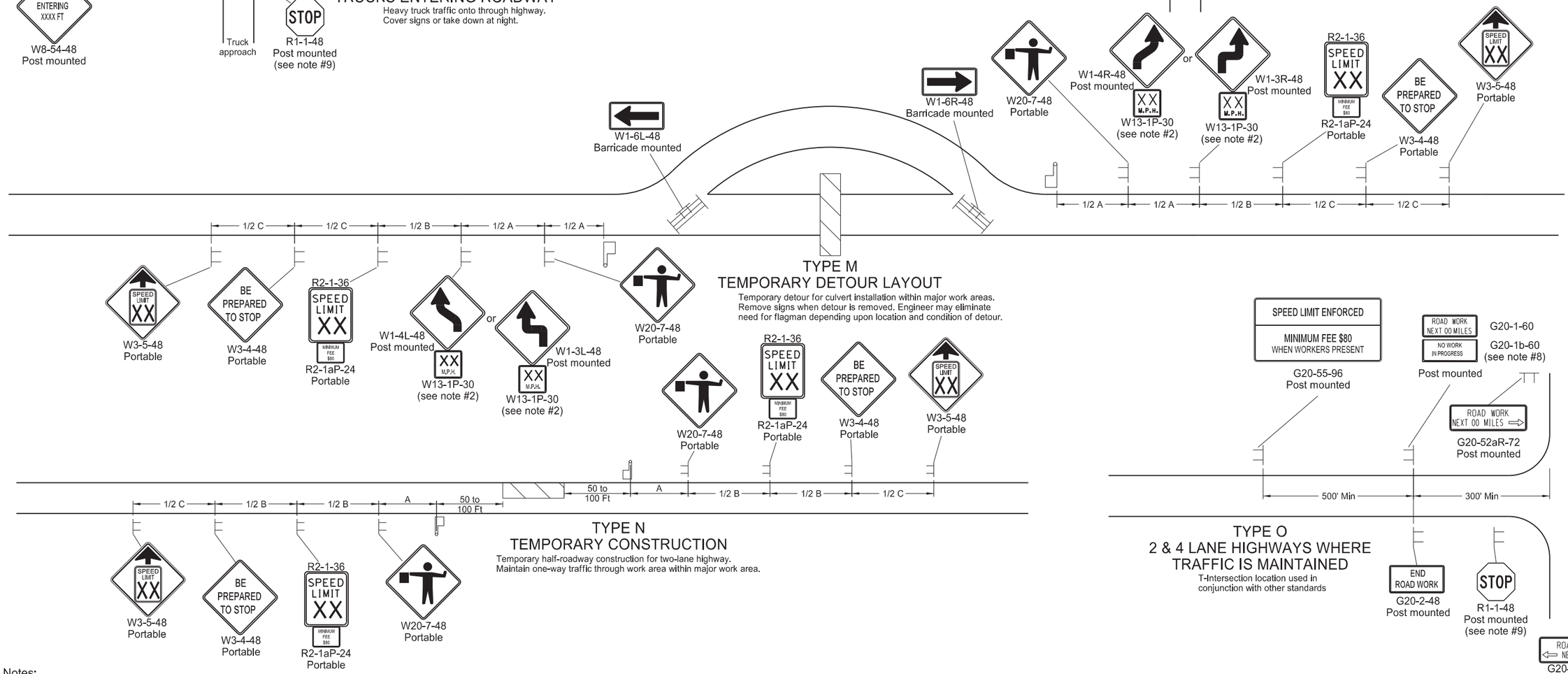
TYPE K
TRUCKS ENTERING ROADWAY

Heavy truck traffic onto through highway.
Cover signs or take down at night.



TYPE L
TRUCKS CROSSING ROADWAY

Trucks crossing through highway.
Cover signs or take down at night.



TYPE M
TEMPORARY DETOUR LAYOUT

Temporary detour for culvert installation within major work areas.
Remove signs when detour is removed. Engineer may eliminate need for flagman depending upon location and condition of detour.

TYPE N
TEMPORARY CONSTRUCTION

Temporary half-roadway construction for two-lane highway.
Maintain one-way traffic through work area within major work area.

TYPE O
2 & 4 LANE HIGHWAYS WHERE TRAFFIC IS MAINTAINED

T-Intersection location used in conjunction with other standards

Notes:

1. Place barricades on a moveable assemblies and signs on portable assemblies when located on roadway.
2. Where necessary, safe speed to be determined by the Engineer.
3. Determine the reduced speed limit based on the in-place speed limit before construction. Where speed reductions exceed 30 mph, install a second speed limit sign with the desired speed reduction (not to exceed 30 mph.) Place the second speed limit sign at ½ B.
4. Install flags on warning signs in urban areas when signs are not portable. Mount 24 inch square flags perpendicular to the edges of the sign, and at such a distance above the edge that the flag does not touch the sign when limp.
5. Cover existing speed limit signs within a reduced speed zone.
6. Covered (when approved by engineer) or obliterated pavement marking measured as Obliteration of Pavement Marking.
7. As an option, use portable sign supports in lieu of post mounted signs in accordance with NDDOT Standard Drawing D-704-14.
8. Install sign G20-1b-60 when work is suspended for winter.
9. If existing stop sign is in place, a 48" stop sign is not required.
10. Sign G20-55-96 is not required if layout is part of other traffic control that contains this sign, or if work is less than 15 days.
11. Recommend using 40 mph speed limit in vicinity of workers, unless location and conditions dictate otherwise.

ADVANCE WARNING SIGN SPACING

Road Type	Distance Between Signs Min. (ft)		
	A	B	C
Urban - Low Speed (30 mph or less)	150	150	150
Urban - Low Speed (over 30 to 40mph)	280	280	280
Urban - High Speed (over 40 mph to 50 mph)	360	360	360
Rural - High Speed (over 50 mph to 65 mph)	720	720	720
Urban Expressway and Freeway (55 mph to 60 mph)	850	1350	2200
Rural Expressway and Freeway (70 mph to 75 mph)	1000	1500	2640
Interstate/4-Lane Divided (Maintenance and Surveying)	750	1000	1500

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION

9-27-13

REVISIONS

DATE	CHANGE
08-17-17	Update notes & sign numbers
11-01-19	Revised sign numbers & note 7
12-09-21	Added Speed Limit Enforced and Dollars At Work signs
11-29-22	Removed Dollars At Work

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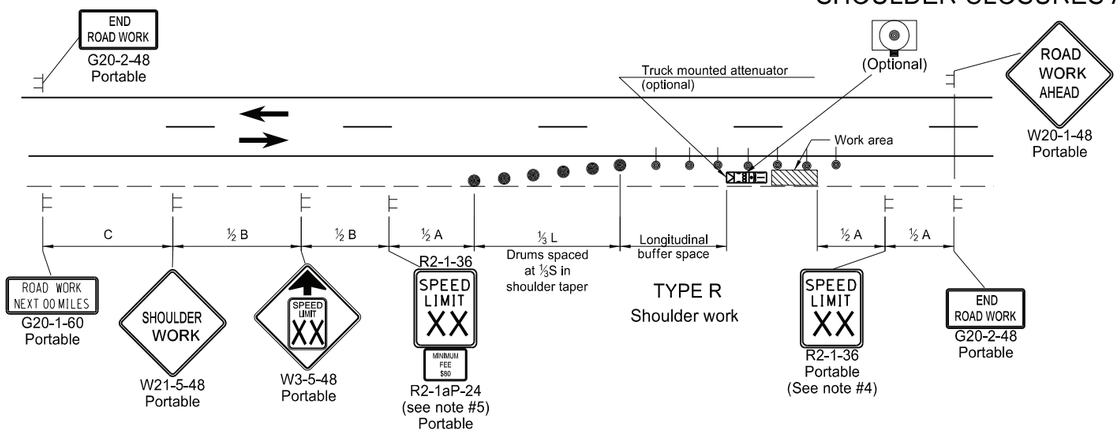
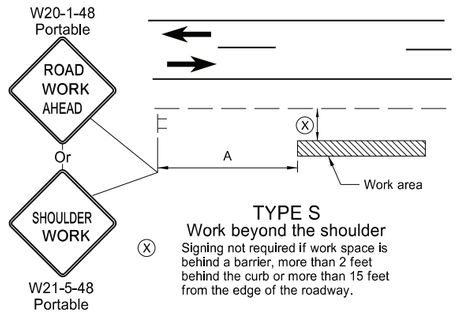
11/29/22

SHOULDER CLOSURES AND BRIDGE PAINTING LAYOUTS

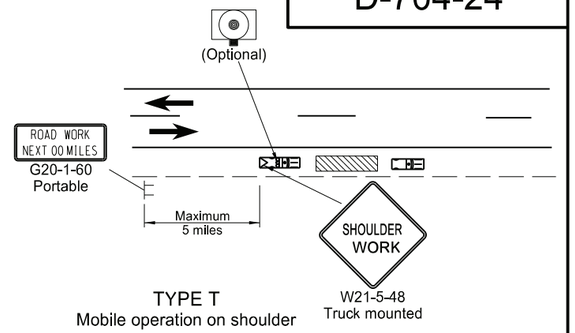
D-704-24



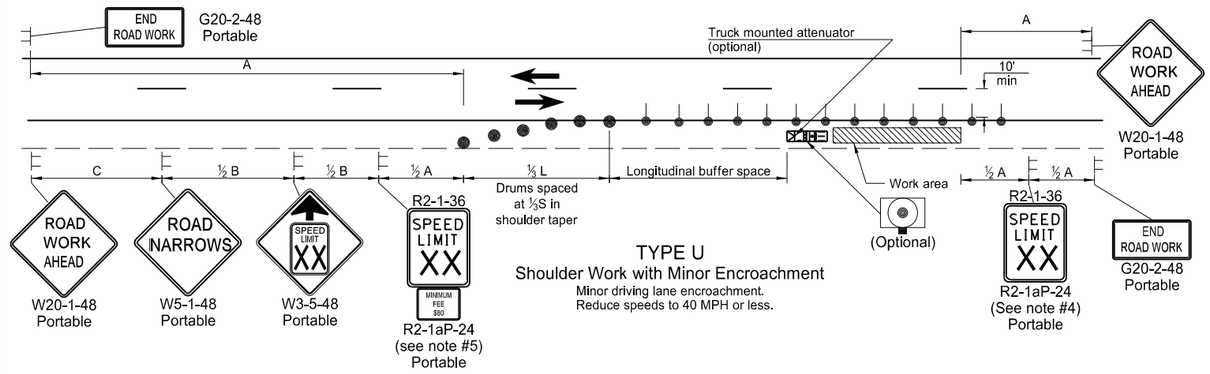
TYPE R
Shoulder work



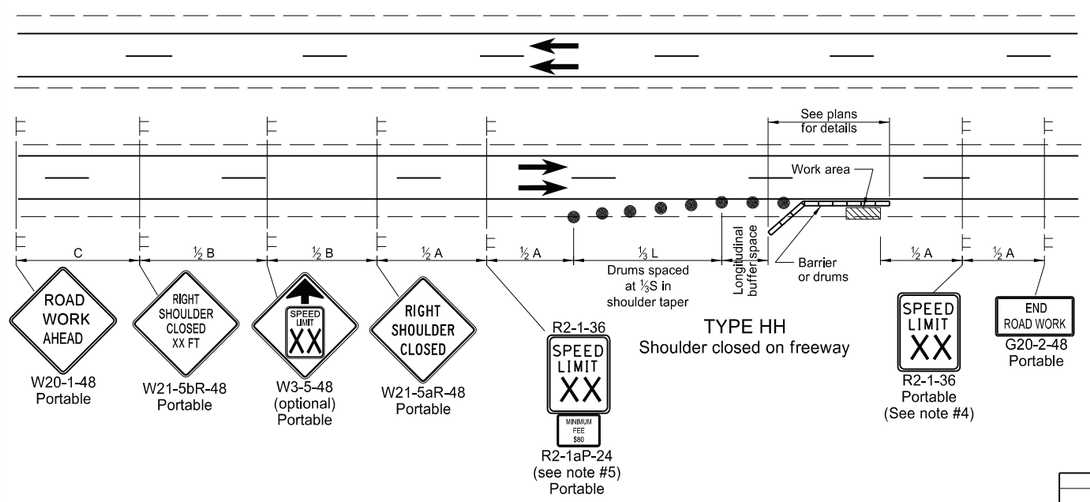
TYPE S
Work beyond the shoulder
Signing not required if work space is behind a barrier, more than 2 feet behind the curb or more than 15 feet from the edge of the roadway.



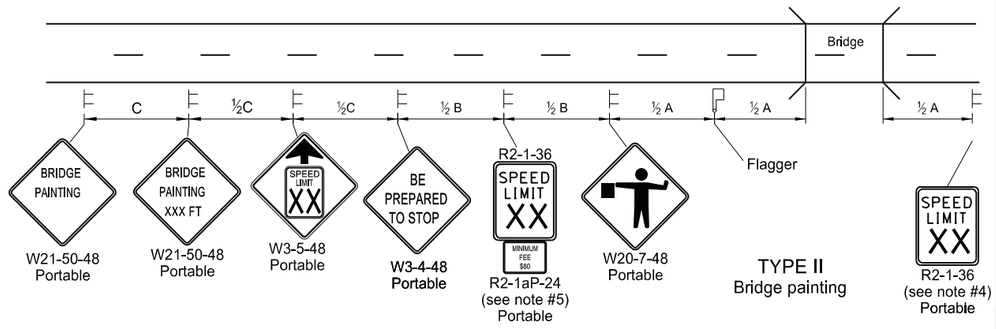
TYPE T
Mobile operation on shoulder



TYPE U
Shoulder Work with Minor Encroachment
Minor driving lane encroachment.
Reduce speeds to 40 MPH or less.



TYPE HH
Shoulder closed on freeway



TYPE II
Bridge painting

Notes
1. Variables
   S = Numerical value of speed limit or 85th percentile.
   W = The width of the taper in feet.
   L = Minimum length of taper, S x W for freeways, expressways, and all other roads with speeds of 45 mph or greater, or W x S^2 /60 for urban, residential, and other streets with speeds of 40 mph or less.
2. Space delineator drums for tapering traffic at dimension "S". Space delineator drums or tubular markers for tangents at 2 times "S".
3. Sequencing Arrow Panels
   Use Type A on roadways with slow moving traffic speeds and low volume (25 mph or less and 750 ADT or less).
   UseType B on roadways with moderate traffic speeds and volumes (40 mph or less and 5000 ADT or less).
   Use Type C on roadways with high traffic speeds and volumes (over 40 mph or over 5000 ADT).
4. Re-establish speed limit. Determine exact speed limit in the field, dependent on location and conditions.
5. Determine the reduced speed limit based on the in-place speed limit before construction. Where speed reductions exceed 30 MPH, install a second speed limit sign with the desired speed reduction (not to exceed 30 mph.) Place the second speed limit sign at ½B.
6. Install flags on warning signs in urban areas when signs are not portable. Mount 24 inch square flags perpendicular to the edges of the sign, and at such a distance above the edge that the flag does not touch the sign when limp.
7. Cover existing speed limit signs within a reduced speed zone.
8. As an option, use portable sign supports in lieu of post mounted signs in accordance with NDDOT Standard Drawing D-704-14.
9. Recommend 40 mph speed limit in vicinity of workers, unless location and conditions dictate otherwise.

KEY

Sign	Work area
Delineator Drum	Tubular Marker
Sequencing Arrow Panel (Caution Mode)	

ADVANCE WARNING SIGN SPACING

Road Type	Distance Between Signs Min. (ft) A	B	C
Urban - Low Speed (30 mph or less)	150	150	150
Urban - Low Speed (over 30 to 40 mph)	280	280	280
Urban - High Speed (over 40 mph to 50 mph)	360	360	360
Rural - High Speed (over 50 mph to 65 mph)	720	720	720
Urban Expressway and Freeway (55 mph to 60 mph)	850	1350	2200
Rural Expressway and Freeway (70 mph to 75 mph)	1000	1500	2640
Interstate/4-Lane Divided (Maintenance and Surveying)	750	1000	1500

Longitudinal Buffer Space

Speed (mph)	Length Min (feet)
20	115
25	155
30	200
35	250
40	305
45	360
50	425
55	495
60	570
65	645
70	730
75	820

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION

9-27-13

REVISIONS

DATE	CHANGE
8-17-17	Updated notes & revised signs
11-01-19	Revised drum spacing & signs nos.
8-01-24	Electronic Stamp/Signature

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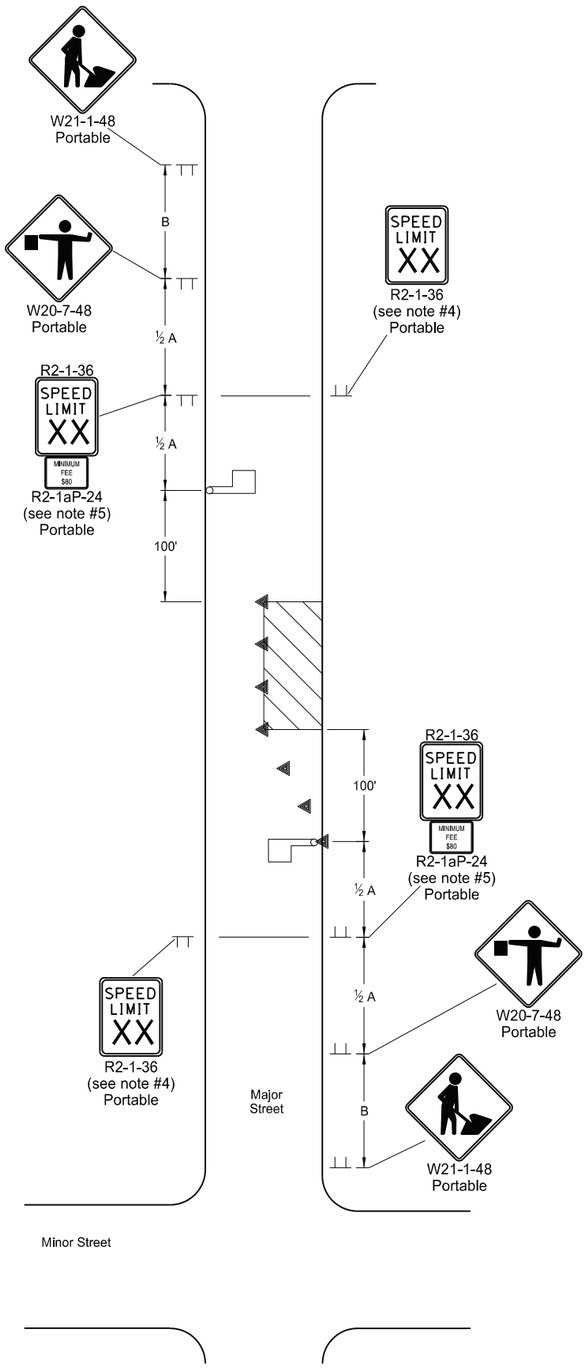
08/01/24

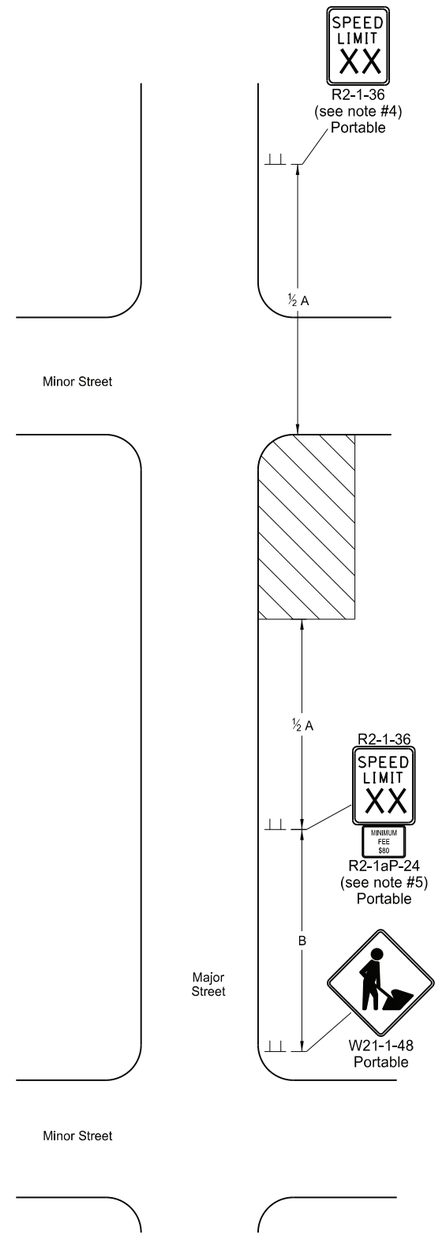
LANE CLOSURES ON URBAN STREETS LAYOUTS

D-704-25



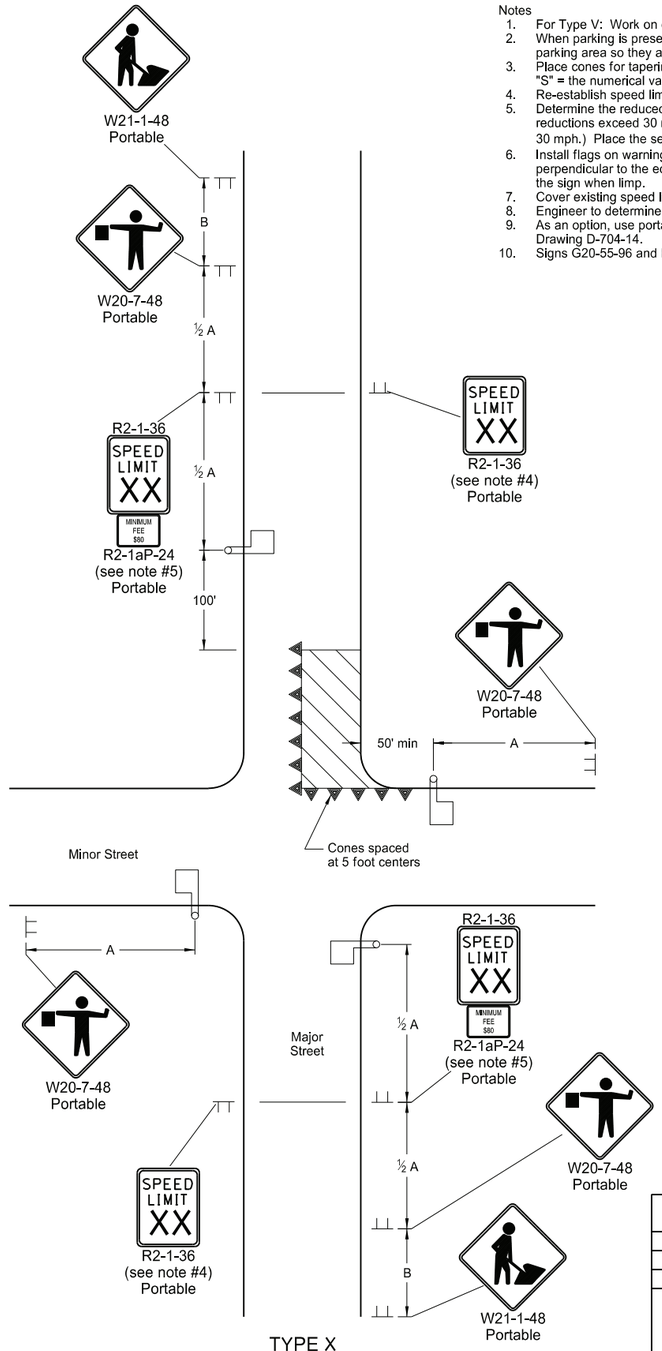
TYPE V
LANE CLOSURE ON URBAN STREET

Portion of roadway closed to traffic only
during daylight hours (mid block location).



TYPE W
WORK BEYOND CURB ON URBAN STREET

Work area outside driving lane and no closure necessary.



TYPE X
LANE CLOSURE NEAR INTERSECTION ON URBAN STREET

Portion of roadway closed to traffic only
during daylight hours (end block location).

Notes

1. For Type V: Work on one side of roadway at a time so as not to block off more than one lane of traffic.
2. When parking is present, place signs so they are entirely visible above parked vehicles or at the edge of the parking area so they are visible to oncoming traffic. Place signs on portable mounts when located on roadway.
3. Place cones for tapering traffic at 3 equal spaces and cones for tangents at dimension "S". "S" = the numerical value of speed limit.
4. Re-establish speed limit. Determine exact speed limit in the field, dependent on location and conditions.
5. Determine the reduced speed limit based on the in-place speed limit before construction. Where speed reductions exceed 30 mph, install a second speed limit sign with the desired speed reduction (not to exceed 30 mph.) Place the second speed limit sign at ½ B.
6. Install flags on warning signs in urban areas when signs are not portable. Mount 24 inches square flags perpendicular to the edges of the sign, and at such a distance above the edge that the flag does not touch the sign when limp.
7. Cover existing speed limit signs within reduced speed zones.
8. Engineer to determine safe speed, when necessary.
9. As an option, use portable sign supports in lieu of post mounted signs in accordance with NDDOT Standard Drawing D-704-14.
10. Signs G20-55-96 and R2-1aP-24 are not required for urban projects.

ADVANCE WARNING SIGN SPACING			
Road Type	Distance Between Signs Min. (ft)		
	A	B	C
Urban - Low Speed (30 mph or less)	150	150	150
Urban - Low Speed (over 30 to 40 mph)	280	280	280
Urban - High Speed (over 40 mph to 50 mph)	360	360	360
Rural - High Speed (over 50 mph to 65 mph)	720	720	720
Urban Expressway and Freeway (55 mph to 60 mph)	850	1350	2200
Rural Expressway and Freeway (70 mph to 75 mph)	1000	1500	2640
Interstate/4-Lane Divided (Maintenance and Surveying)	750	1000	1500

KEY

Sign	Work area
Cones	Flagger

NORTH DAKOTA
DEPARTMENT OF TRANSPORTATION

9-27-13

REVISIONS

DATE	CHANGE
8-17-17	Updated notes & removed signs
11-01-19	Revised note & added Min Fee sign
8-01-24	Electronic Stamp/Signature

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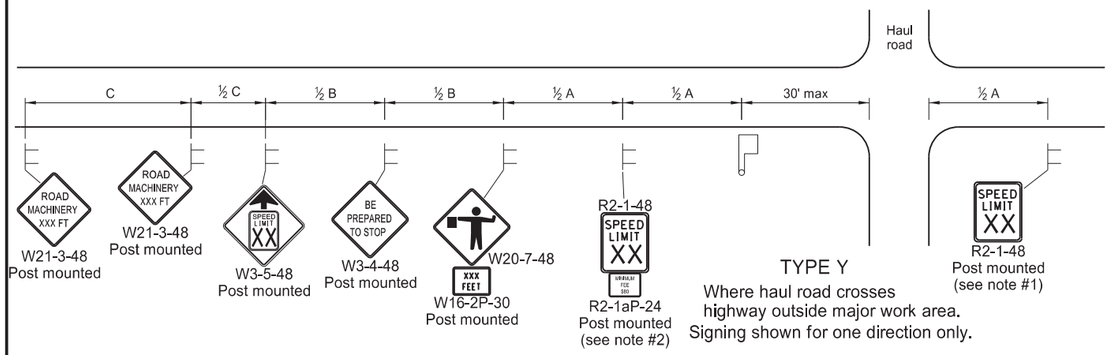
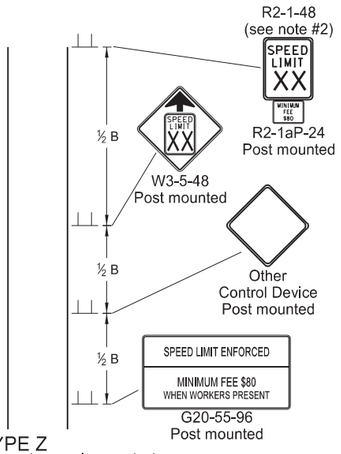
08/01/24

MISCELLANEOUS SIGN LAYOUTS

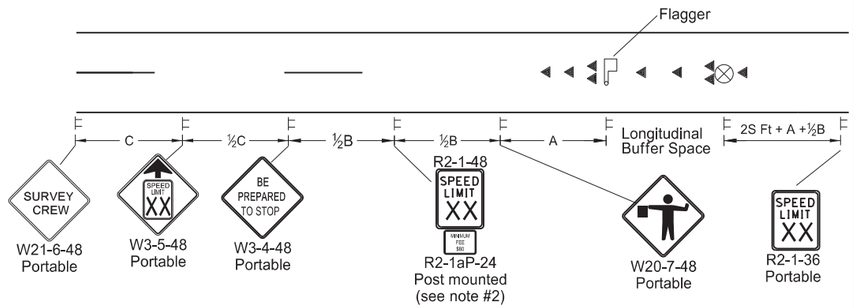
D-704-26



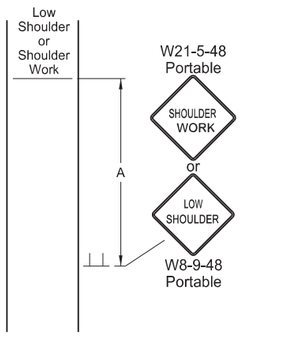
TYPE Y
Where haul road crosses highway outside major work area.
Signing shown for one direction only.



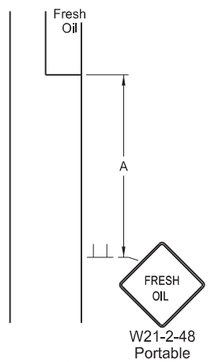
TYPE Z
Where speed zone is needed
Signing shown for one direction only.



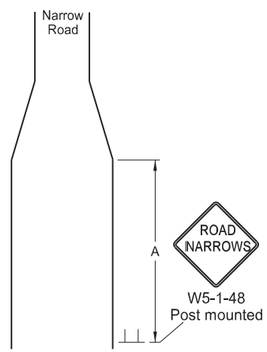
TYPE AA
Where survey crew is used
Signing shown for one direction only.



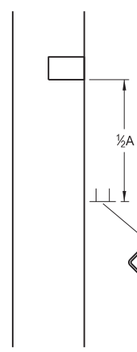
TYPE BB
Within major work area where sign conditions exist



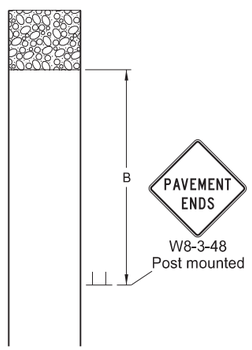
TYPE CC
Where sign conditions exist



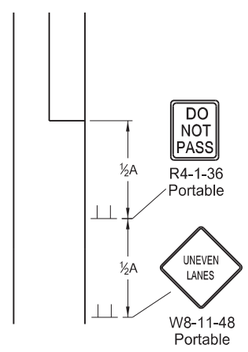
TYPE DD
Where sign conditions exist



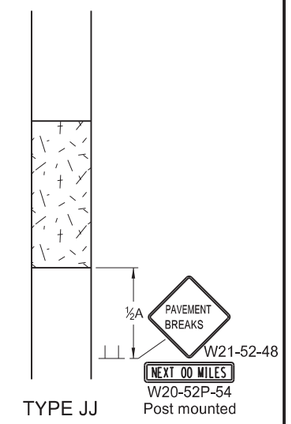
TYPE EE
Where sign conditions exist



TYPE FF
Where sign conditions exist
Signing shown for one direction only.



TYPE GG
Where elevation difference exists between lanes

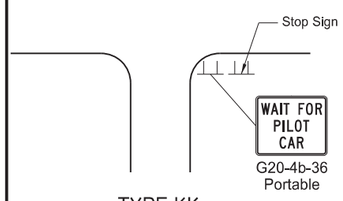


TYPE JJ
For break in pavement.
Install signs when conditions exist and remove when not applicable.
Signing shown for one direction only.

KEY

Flagger	Sign
Cones	Survey Equipment

S = Numerical value of speed limit or 85th percentile.



TYPE KK
At major intersections within pilot car control area

Notes
1. Re-establish speed limit. Determine exact speed limit in the field, dependent on location and conditions.
2. Determine reduced speed limit based on in-place speed limit before construction. Where speed reductions exceed 30 mph, install a second speed limit sign with the desired speed reduction (not to exceed 30 mph.) Place the second speed limit sign at ½B.
3. Install flags on warning signs in urban areas when signs are not portable. Mount 24 inch square flags perpendicular to the edges of the sign, and at such a distance above the edge that the flag does not touch the sign when limp.
4. Cover existing speed limit signs within reduced speed zones.
5. As an option, use portable sign supports in lieu of post mounted signs in accordance with NDDOT Standard Drawing D-704-14.
6. Sign G20-55-96 is not required if this standard is part of other traffic control layouts, or work is less than 15 days.
7. When pilot car operation is used, place sign G20-4b-36 "Wait For Pilot Car" at major intersections within pilot car control area.
8. Recommend 40 mph speed limit in vicinity of workers, unless location and conditions dictate otherwise.
9. Layouts shown for one direction only.

ADVANCE WARNING SIGN SPACING

Road Type	Distance Between Signs Min. (ft) A	B	C
Urban - Low Speed (30 mph or less)	150	150	150
Urban - Low Speed (over 30 to 40 mph)	280	280	280
Urban - High Speed (over 40 mph to 50 mph)	360	360	360
Rural - High Speed (over 50 mph to 65 mph)	720	720	720
Urban Expressway and Freeway (55 mph to 60 mph)	850	1350	2200
Rural Expressway and Freeway (70 mph to 75 mph)	1000	1500	2640
Interstate/4-Lane Divided (Maintenance and Surveying)	750	1000	1500

Longitudinal Buffer Space

*Speed (mph)	Length Min (feet)
20	115
25	155
30	200
35	250
40	305
45	360
50	425
55	495
60	570
65	645
70	730
75	820

* Posted speed, off-peak 85th percentile speed prior to work starting, or the anticipated operating speed in mph.

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION

9-27-13

REVISIONS

DATE	CHANGE
8-17-17	Added speed limit signs. Updated notes & sign numbers.
11-01-19	Revised note 5 & sign numbers.
2-23-23	Revised distance & removed signs.

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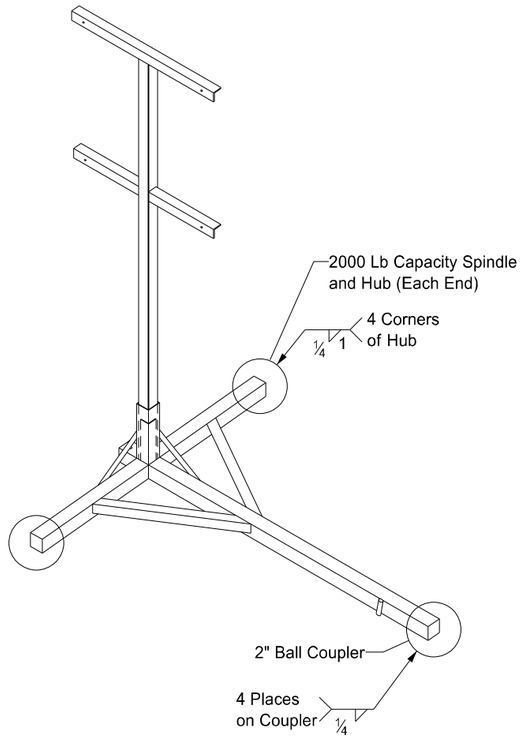
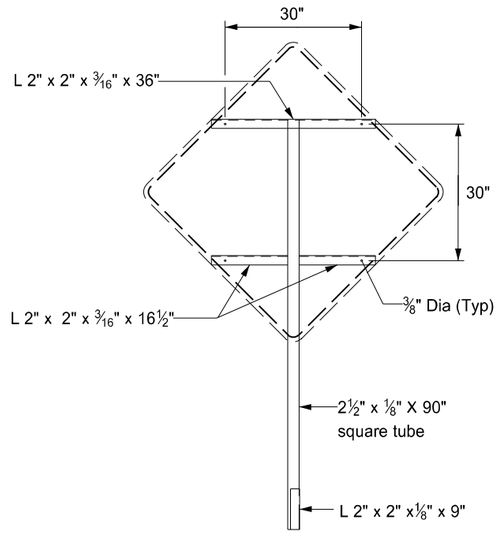
PROFESSIONAL
PE-4683
ENGINEER
NORTH DAKOTA

02/23/23

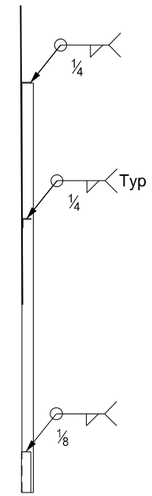
PORTABLE SIGN SUPPORT ASSEMBLY

D-704-50





FRONT

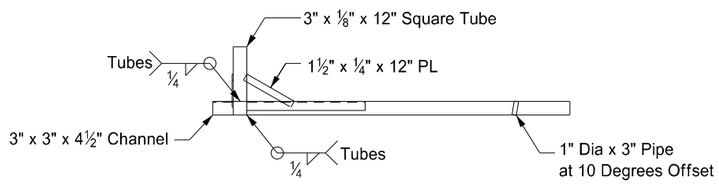


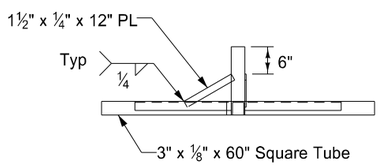
RIGHT

SIGN SUPPORT

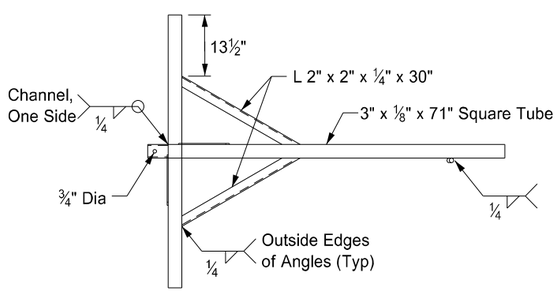
Notes:

1. Maximum 250 pound weight of assembly.
2. Use a 14" wheel and tire.
3. Use no automotive and equipment axle assemblies for trailer-mounted sign supports.
4. Other NCHRP 350 or MASH crash tested assemblies are acceptable.





RIGHT



TOP

TRAILER

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
11-23-10	
REVISIONS	
DATE	CHANGE
12/02/2020	Updated Note to active voice.

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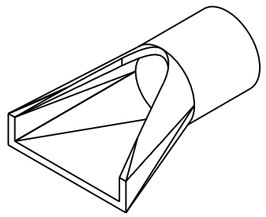
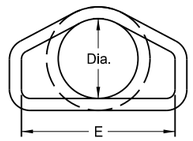
12 02 2020

REINFORCED CONCRETE PIPE CULVERTS AND END SECTIONS
(Round Pipe)

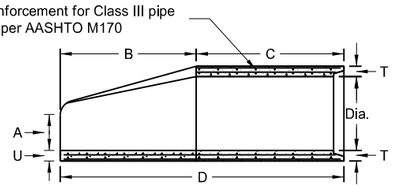
FLARED END SECTION						
TERMINAL DIMENSIONS						
DIA	A	B	C	D	E	U
12	0'-4"	2'-0"	4'-0⅞"	6'-0⅞"	2'-0"	2"
15	0'-6"	2'-3"	3'-10"	6'-1"	2'-6"	2¼"
18	0'-9"	2'-3"	3'-10"	6'-1"	3'-0"	2½"
21	0'-9"	3'-0"	3'-1"	6'-1"	3'-6"	2¾"
24	0'-9½"	3'-7½"	2'-6"	6'-1½"	4'-0"	3"
27	0'-10½"	4'-0"	2'-1½"	6'-1½"	4'-6"	3¼"
30	1'-0"	4'-6"	1'-7¾"	6'-1¾"	5'-0"	3½"
36	1'-3"	5'-3"	2'-9"	8'-0"	6'-0"	4"
42	1'-9"	5'-3"	2'-9"	8'-0"	6'-6"	4½"
48	2'-0"	6'-0"	2'-0"	8'-0"	7'-0"	5"
54	2'-3"	5'-5"	2'-9¼"	8'-2¼"	7'-6"	5½"
60	2'-11"	5'-0"	3'-3"	8'-3"	8'-0"	5"
66	2'-6"	6'-0"	2'-3"	8'-3"	8'-6"	5½"
72	3'-0"	6'-6"	1'-9"	8'-3"	9'-0"	6"
78	3'-0"	7'-6"	1'-9"	9'-3"	9'-6"	6½"
84	3'-0"	7'-6½"	1'-9"	9'-3½"	10'-0"	6½"
90	3'-5"	7'-3½"	2'-0"	9'-3½"	11'-0"	6½"



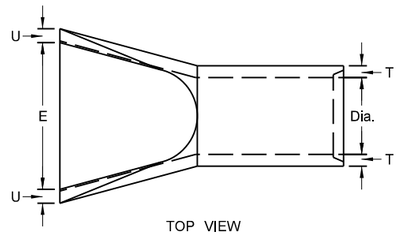
PERSPECTIVE



END VIEW



SIDE VIEW



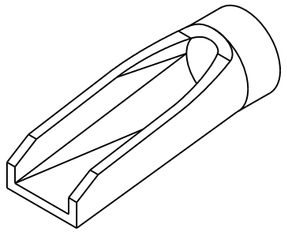
TOP VIEW

REINFORCED CONCRETE PIPE - FLARED END SECTION
Reinforcement to be equivalent to Class III RCP

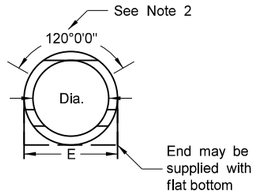
NOTES:

1. All reinforcing steel shall meet AASHTO M170 requirements.
2. All circular, longitudinal, and elliptical reinforcement shall be assembled and securely fastened in cage fashion so as to maintain reinforcement in exact shape and correct positions within the forms.
3. Laying length of pipe: 12" to 66" (incl.) = not less than 4 feet
   66" to 108" (incl.) = not less than 6 feet
4. Joints shall be sealed with rubber gaskets or with sealer approved by the engineer whenever pipe are specified for storm drain or sanitary sewers.
5. For Class IV and Class V reinforced concrete pipe and end section sizes which do not have reinforcement specified by AASHTO M170, shop drawings and design calculations shall be prepared and sealed by a Professional Engineer and submitted for the Engineer's review.

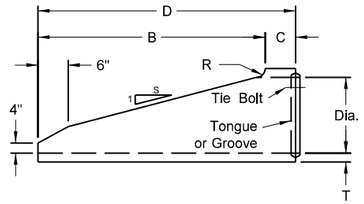
TRAVERSABLE END SECTION						
DIA	B	C	D	E	R	S
15"	4'	9"	4'-9"	1'-7½"	3"	6
18"	5'-9"	9"	6'-6"	1'-11"	3"	6
24"	6'	1'	7'	2'-6"	3"	4
30"	7'-6"	1'	8'-6"	3'-1"	3½"	4
36"	7'-3"	15"	8'-6"	3'-8"	3"	4



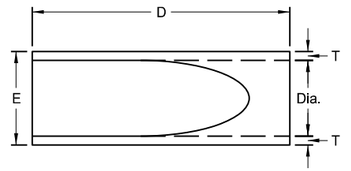
PERSPECTIVE



END VIEW



SIDE VIEW



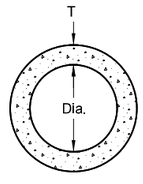
TOP VIEW

REINFORCED CONCRETE PIPE - TRAVERSABLE END SECTION
Reinforcement to be equivalent to Class III RCP

NOTES (Traversable End Section):

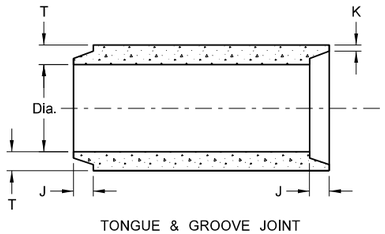
1. Manufactured in accordance with applicable portions of ASTM C76/AASHTO M170.
2. Reinforcement per Class III RCP with double reinforcement in the upper 120° of the full barrel portion.

All Classifications of Round Concrete Pipe					
Internal Dia. of pipe in Inches	Cross-Sectional Water Area	Weight per lin. foot of Pipe Std. Wall	Joint J Groove End Min./Max.	Joint K Tongue End Min.	Minimum Wall Thickness (T)
Dia	Sq. ft.	Lbs.	In.	In.	In.
12	0.79	92	1⅛-2⅛	¾	2
15	1.23	127	1⅛-2¼	⅞	2¼
18	1.77	168	1⅛-2⅛	1	2½
21	2.40	214	1⅛-3⅛	1⅛	2¾
24	3.14	265	2¾-3¾	1⅛	3
27	3.98	322	2¾-4	1¼	3¼
30	4.91	384	3¼-4¼	1¼	3½
33	5.94	452	3¼-4¼	1½	3¾
36	7.07	524	3¼-4¼	1½	4
42	9.62	685	3¾-4¾	1¾	4½
48	12.57	685	3⅞-4¾	1⅞	5
54	15.90	1070	4⅛-5¼	2	5½
60	19.63	1296	4½-5½	2¼	6
66	23.76	1542	5-6	2⅝	6½
72	28.27	1810	5⅛-6¾	2⅞	7
78	33.18	2098	6¼-7¼	2⅞	7½
84	38.48	2410	5⅛-7¾	3⅜	8
90	44.18	2793	6¾-8½	3⅛	8½
96	50.27	3092	7-8¼	3½	9
102	56.75	3466	7-8¼	3½	9½
108	63.62	3864	7¼-8½	3¾	10

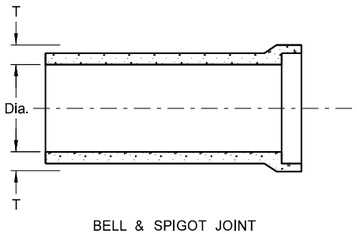


END VIEW

CIRCULAR PIPE

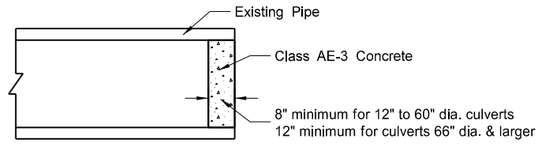


TONGUE & GROOVE JOINT



BELL & SPIGOT JOINT

JOINTS FOR REINFORCED CONCRETE PIPE



CONCRETE PIPE PLUG

SEE STANDARD DRAWING D-714-22 FOR DETAILS OF CONCRETE PIPE TIES (TIE BOLTS).

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
05-12-14	
REVISIONS	
DATE	CHANGE
01-21-15	Revised Note 5
11-21-16	Revised End Section Dimensions
09-18-19	Updated Perspective View Details

This document was originally issued and sealed by Jon Ketterling Registration Number PE-4684, on 9/18/19 and the original document is stored at the North Dakota Department of Transportation