



City of Plymouth

Contract Documents

HWY 55 Frontage Road Reconstruction
City Project 13002
March 2018

CONTRACT DOCUMENTS
HWY 55 FRONTAGE ROAD RECONSTRUCTION
PLYMOUTH, MINNESOTA
CITY PROJECT NO. 13002

MARCH 2018

I hereby certify that this specification 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 Minnesota.


Michael Payne, P.E.

50484
Minn. Reg. No.

3/27/2018
Date

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ADVERTISEMENT FOR BIDS

**HWY 55 FRONTAGE ROAD RECONSTRUCTION
GRADING, BASE, BITUMINOUS SURFACING, CONCRETE CURB AND GUTTER,
STORM SEWER & WATER MAIN**

**PLYMOUTH, MINNESOTA
CITY PROJECT NO. 13002**

NOTICE IS HEREBY GIVEN that sealed bids will be received by the City of Plymouth until Thursday, April 19, 2018 at 10:00 am, at the Plymouth City Hall at 3400 Plymouth Boulevard, Plymouth, MN, at which time they will be publicly opened and read aloud, for the furnishing of all labor and material for the construction of:

COMMON EXCAVATION	C.Y.	4,107
SELECT GRANULAR BORROW (CV)	C.Y.	1,783
AGGREGATE BASE CL 7 (CV)	C.Y.	1,816
TYPE SPNWB330C BASE COURSE MIXTURE (2 1/2")	S.Y.	4,348
TYPE SPWEA340C WEARING COURSE MIXTURE (1 1/2")	S.Y.	5,438
6" PE STREET DRAINTILE W/SOCK	L.F.	2,407
10" HDPE WM SDR 11 (BY DIRECTIONALLY DRILLING)	L.F.	985
CONCRETE CURB & GUTTER DESIGN B618	L.F.	2,891

Bids shall be on the forms provided for that purpose and according to the Contract Documents dated March 27, 2018.

Bid Forms and Contract Documents may be viewed at the City's Engineering Department counter located in the lower level of City Hall.

Contractors desiring a copy of the Bid Forms and Contract Documents may obtain them from the City of Plymouth's Engineering Department web site at the following link: <http://www.plymouthmn.gov/bids>

Bid Security in the amount of 5% of the bid must accompany each bid in accordance with the Instructions to Bidders.

Bids shall be directed to the Director of Public Works, securely sealed and endorsed upon the outside wrapper, "BID FOR HWY 55 FRONTAGE ROAD RECONSTRUCTION, CITY PROJECT NO. 13002.

The City of Plymouth reserves the right to reject any or all bids, to waive irregularities and informalities therein and to award the contract in the best interests of the City.

DATED: March 27, 2018

INSTRUCTIONS TO BIDDERS

1. DEFINED TERMS

Terms used in these Instructions to BIDDERS which are defined in the Standard General Conditions of the Construction Contract (No. C-700, 2013 Edition) have the meanings assigned to them in the General Conditions. The term "BIDDER" means one who submits a Bid directly to OWNER, as distinct from a sub bidder, who submits a Bid to a BIDDER. The term "Successful BIDDER" means the lowest, qualified responsible and responsive BIDDER to whom OWNER (on the basis of OWNER'S evaluation as hereinafter provided) makes an award. The term, "Bidding Documents" includes the Advertisement or Invitation to Bid, Instructions to BIDDERS, the Bid Form, and the proposed Contract Documents (including all Addenda issued prior to receipt of Bids).

2. COPIES OF BIDDING DOCUMENTS

- 2.1 Contractors desiring a copy of the Bid Forms and Contract Documents may obtain them from the City of Plymouth's Engineering Department web site at the following link:
<http://www.plymouthmn.gov/bids>
- 2.2 Complete sets of Bidding Documents must be used in preparing Bids; neither OWNER nor ENGINEER assumes any responsibility for errors or misinterpretations resulting from the use of incomplete sets of Bidding Documents.
- 2.3 OWNER and ENGINEER in making copies of Bidding Documents available on the above terms do so only for the purpose of obtaining Bids on the Work and do not confer a license or grant for any other use.

3. EXAMINATION OF CONTRACT DOCUMENTS AND SITE

- 3.1 It is the responsibility of each BIDDER before submitting a Bid, to (a) examine the Contract Documents thoroughly, (b) visit the site to become familiar with local conditions that may affect cost, progress, performance or furnishing of the Work, (c) consider federal, state and local Laws and Regulations that may affect cost, progress, performance or furnishing of the Work, (d) study and carefully correlate BIDDER'S observations with the Contract Documents, and (e) notify ENGINEER in writing of all conflicts, errors or discrepancies in the Contract Documents.
- 3.2 Reference is made to the Supplementary Conditions for identification of:
 - 3.2.1 Those reports of explorations and tests of subsurface conditions at the site which have been utilized by ENGINEER in preparation of the Contract Documents. BIDDER may rely upon the accuracy of the technical data contained in such reports but not upon non-technical data, interpretations or opinions contained therein or for the completeness thereof for the purposes of bidding or construction.
 - 3.2.2 Those drawings of physical conditions in or relating to existing surface and subsurface conditions (except Underground Facilities) which are at or contiguous to the site which have been utilized by ENGINEER in preparation of the Contract Documents. BIDDER may rely upon the accuracy of the technical data contained in such drawings but not upon the completeness thereof for the purposes of bidding or construction.

Copies of such reports and drawings will be made available by OWNER to any BIDDER on request. Those reports and drawings are not part of the Contract Documents, but the technical data contained therein upon which BIDDER is entitled to rely as provided in Paragraphs 3.2.1 and 3.2.2 are incorporated therein by reference. Such technical data has been identified and established in the Supplementary Conditions.

- 3.3 Information and data reflected in the Contract Documents with respect to Underground Facilities at or contiguous to the site is based upon information and data furnished to OWNER and ENGINEER by OWNERS of such Underground Facilities or others, and OWNER does not assume responsibility for the accuracy or completeness thereof unless it is expressly provided otherwise in the Supplementary Conditions.
- 3.4 Provisions concerning responsibilities for the adequacy of data furnished to prospective BIDDERS on subsurface conditions, Underground Facilities and other physical conditions, and possible changes in the Contract Documents due to differing conditions appear in Paragraphs 5.3 and 5.4 of the General Conditions.
- 3.5 Before submitting a Bid, each BIDDER will, at BIDDER'S own expense, make or obtain any additional examinations, investigations, explorations, tests and studies and obtain any additional information and data which pertain to the physical conditions (surface, subsurface and Underground Facilities) at or contiguous to the site or otherwise which may affect cost, progress, performance or furnishing of the Work and which BIDDER deems necessary to determine its Bid for performing and furnishing the Work in accordance with the time, price and other terms and conditions of the Contract.
- 3.6 On request in advance, OWNER will provide each BIDDER access to the site to conduct such explorations and tests as each BIDDER deems necessary for submission of a Bid. BIDDER shall fill all holes, clean up and restore the site to its former condition upon completion of such explorations.
- 3.7 The lands upon which the Work is to be performed, rights-of-way and easements for access thereto and other lands designated for use by CONTRACTOR in performing the Work are identified in the Contract Documents. All additional lands and access thereto required for temporary construction facilities or storage of materials and equipment are to be provided by CONTRACTOR. Easements for permanent structures or permanent changes in existing structures are to be obtained and paid for by OWNER unless otherwise provided in the Contract Documents.
- 3.8 The submission of a Bid will constitute an incontrovertible representation by BIDDER that BIDDER has complied with every requirement of this Article 3, that without exception the Bid is premised upon performing and furnishing the Work required by the Contract Documents and such means, methods, techniques, sequences or procedures of construction as may be indicated in or required by the Contract Documents, and that the Contract Documents are sufficient in scope and detail to indicate and convey understanding of all terms and conditions for performance and furnishing of the Work.

4. INTERPRETATIONS AND ADDENDA

- 4.1 All questions about the meaning or intent of the Contract Documents are to be made in writing, and directed to ENGINEER. Interpretations or clarification's considered necessary by ENGINEER in response to such questions will be issued with an Addenda by email, fax or mailed or to all parties recorded by ENGINEER as having received the Bidding Documents. Questions received less than two days prior to the date for opening of Bids

may not be answered. Only questions answered by formal written Addenda will be binding. Oral and other interpretations or clarifications will be without legal effect.

- 4.2 Addenda may also be issued to modify the Bidding Documents as deemed advisable by OWNER or ENGINEER.

5. BID SECURITY

- 5.1 Each Bid must be accompanied by Bid security made payable to OWNER in an amount of five percent of the BIDDER'S maximum Bid price and in the form of a certified or bank check or a Bid Bond (on form attached, if a form is prescribed) issued by a surety meeting the requirements of Section 6.01 of the General Conditions.
- 5.2 The Bid security of the Successful BIDDER will be retained until such BIDDER has executed the Agreement and furnished the required contract security, whereupon the Bid security will be returned. If the Successful BIDDER fails to execute and deliver the Agreement and furnish the required contract security within fifteen days after the Notice of Award, OWNER may annul the Notice of Award and the Bid security of that BIDDER will be forfeited. The Bid security of the three lowest BIDDERS may be retained by the OWNER until the Agreement is signed and submitted with the bonds as set forth in Paragraph 2 of the Bid Form. Bid security of other BIDDERS will be returned within seven days after award of the contract.

6. CONTRACT TIME

The number of days within which, or the dates by which, the Work is to be substantially completed and also completed and ready for final payment (the Contract Time) are set forth in the Bid Form and the Agreement.

7. LIQUIDATED DAMAGES

Provisions for liquidated damages are set forth in the Agreement.

8. SUBSTITUTE OR "OR-EQUAL" ITEMS

The Contract, if awarded, will be on the basis of materials and equipment described in the Drawings or specified in the Specifications without consideration of possible substitute or "or-equal" items. Whenever it is indicated in the Drawings or specified in the Specifications that a substitute or "or-equal" item of material or equipment may be furnished or used by CONTRACTOR if acceptable to ENGINEER, application for such acceptance will not be considered by ENGINEER until after the Effective Date of the Agreement. The procedure for submissions of any such application by CONTRACTOR and considerations by ENGINEER is set forth in Article 7 of the General Conditions and may be supplemented in the Supplementary Conditions.

9. SUBCONTRACTORS, SUPPLIERS AND OTHERS

- 9.1 No CONTRACTOR shall be required to employ any Subcontractor, Supplier, other person or organization against whom CONTRACTOR has reasonable objection.

10. BID FORM

- 10.1 The Bid Form is included with the Bidding Documents; additional copies may be obtained from ENGINEER.

- 10.2 All blanks on the Bid Form must be completed in ink or by typewriter.
- 10.3 Bids by corporations must be executed in the corporate name by the president or a vice-president (or other corporate officer accompanied by evidence of authority to sign) and the corporate seal must be affixed and attested by the secretary or an assistant secretary. The corporate address and state of incorporation must be shown below the signature.
- 10.4 Bids by partnerships must be executed in the partnership name and signed by a partner, whose title must appear under the signature and the official address of the partnership must be shown below the signature.
- 10.5 All names must be typed or printed in ink below the signature.
- 10.6 The Bid shall contain an acknowledgment of receipt of all Addenda (the numbers of which must be filled in on the Bid Form).
- 10.7 The address and telephone number for communications regarding the Bid must be shown.
- 10.8 This project's BID FORM contains one section; SCHEDULE A. Schedule A is required to be an acceptable bid for the project. Bids will be evaluated by the OWNER based on Schedule A.

11. SUBMISSION OF BIDS

Bids shall be submitted at the time and place indicated in the Advertisement or Invitation to Bid and shall be enclosed in an opaque sealed envelope, marked with the Project title (and, if applicable, the designated portion of the Project for which the Bid is submitted) and name and address of the BIDDER and accompanied by the Bid security and other required documents. If the Bid is sent through the mail or other delivery system, the sealed envelope shall be enclosed in a separate envelope with the notation "BID ENCLOSED" on the face of it.

12. MODIFICATION AND WITHDRAWAL OF BIDS

- 12.1 Bids may be modified or withdrawn by an appropriate document duly executed (in the manner that a Bid must be executed) and delivered to the place where Bids are to be submitted at any time prior to the opening of Bids.
- 12.2 If, within twenty-four 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, that BIDDER may withdraw its Bid and the Bid security will be returned. Thereafter, that BIDDER will be disqualified from further bidding on the Work to be provided under the Contract Documents.

13. OPENING OF BIDS

Bids will be opened and (unless obviously non-responsive) read aloud publicly. An abstract of the amounts of the Bids will be made available to BIDDERS after the opening of Bids.

14. BIDS TO REMAIN SUBJECT TO ACCEPTANCE

All bids will remain subject to acceptance as set forth in Paragraph 2 of the Bid Form, but OWNER may, in its sole discretion, release any Bid and return the Bid security prior to that date.

15. RESPONSIBLE BIDDER EVALUATION

The City will review the qualifications and experience of bidders for construction, alteration, repair, or maintenance of real or personal property after bids are opened and before a contract is awarded, to determine if the bidder is "responsible." A "responsible" bidder is a bidder qualified to do the work. This will be determined by assessing the bidder's skill, resources, experience, successful performance of similar contracts (on time and on budget), and all other matters bearing upon the likelihood that the contract will be successfully completed. In all cases where a bidder is unknown or where there are any questions about the qualifications of the bidder, the following information will be required of the apparent low bidder:

You are required to complete and return this questionnaire before the City Council considers awarding you the contract.

15.1 Identify all similar public projects in which you were the contractor. If you have had more than five such contracts, list only the last five contracts, and as to each contract identified provide the following information:

Project Description:

Date:

Contact Person at City/County/State:

Were change orders in excess of 5% requested? If yes, explain the circumstances.

Were liquidated damages assessed? If yes, explain the circumstances.

Was the project completed on schedule? If no, explain the circumstances.

15.2 Describe all construction arbitration claims and any construction or project litigation in which you have been a party in the last five years.

15.3 Identify all public projects you have had with the City of Plymouth in the last five years.

15.4 In the last five years has a bonding company ever refused to issue you a performance bond? If yes, explain the circumstances.

15.5 In the last five years have any claims been filed against a performance or payment bond that you have provided a public entity? If yes, explain the circumstances.

15.6 In the last five years, has your firm or any of its owners or employees been fined by a federal or state agency for a contract or workplace matter (such as wage or hour or safety

violations), or debarred under Part 29, Title 49 CFR or any other law from submitting bids on public projects? If yes, explain the circumstances.

15.7 In the last five years, has your firm or any of its owners or employees been charged or convicted of a crime involving the awarding, bidding or performance of a government contract? If yes, provide full details.

Contractor Verification of Compliance

The undersigned, being first duly sworn, as a responding contractor on the Project, represents and swears as follows:

Now, and at all times during the duration of the Project, the undersigned complies with each of the minimum criteria in Minn. Stat. § 16C.285, Subd. 3, the Responsible Contractor Statute.

The undersigned understands that a failure to meet or verify compliance with the minimum criteria established for a "responsible contractor" as defined in Minn. Stat. § 16C.285, Subd. 3, renders a bidder ineligible to be awarded a construction contract for the Project or to perform work on the Project.

Upon request, the undersigned will submit copies of the signed verifications of compliance from all subcontractors.

The undersigned understands that a false statement under oath verifying compliance with any of the minimum criteria shall make the undersigned, or its subcontractor that makes the false statement, ineligible to be awarded a constructed project and may result in termination of a contract awarded to the undersigned or its subcontractor that submits a false statement.

Certified as true and correct this _____ day of _____.

(name)

(name)

*Resolution No. 2015-016, January 13, 2015
(Supersedes Resolution No. 2004-024, January 13, 2004)*

16. AWARD OF CONTRACT

- 16.1 OWNER reserves the right to reject any and all Bids, to waive any and all informalities not involving price, time or changes in the Work and to negotiate contract terms with the Successful BIDDER, and the right to disregard all nonconforming, nonresponsive, unbalanced or conditional Bids. Also, OWNER reserves the right to reject the Bid of any BIDDER if OWNER believes that it would not be in the best interest of the Project to make an award to that BIDDER, whether because the Bid is not responsive or the BIDDER is unqualified or of doubtful financial ability or fails to meet any other pertinent standard or criteria established by OWNER. Discrepancies in 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.
- 16.2 In evaluating Bids, OWNER will consider the qualifications of the BIDDERS, whether or not 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.
- 16.3 OWNER may consider the qualifications and experience of Subcontractors, Suppliers, and other persons and organizations proposed for those portions of the Work as to which the identity of Subcontractors, Suppliers, and other persons and organizations must be submitted as provided in the Supplementary Conditions. OWNER also may consider the operating costs, maintenance requirements, performance data and guarantees of major items of materials and equipment proposed for incorporation in the Work when such data is required to be submitted prior to the Notice of Award.
- 16.4 OWNER may conduct such investigations as OWNER deems necessary to assist in the evaluation of any Bid and to establish the responsibility, qualifications and financial ability of BIDDERS, proposed Subcontractors, Suppliers and other persons and organizations to perform and furnish the Work in accordance with the Contract Documents to OWNER'S satisfaction within the prescribed time.
- 16.5 If the contract is to be awarded, it will be awarded to the lowest BIDDER whose evaluation by OWNER indicates to OWNER that the award will be in the best interests of the Project.
- 16.6 If the Contract is to be awarded, OWNER will give the Successful BIDDER a Notice of Award within five days after the day of the award.
- 16.7 OWNER reserves the right to determine the successful BIDDER based on a combination of the Base Bid and Alternate Bid. The OWNER will consider the best interest of the project in making this determination.

17. CONTRACT SECURITY

Paragraph 6.01 of the General Conditions and the Supplementary Conditions set forth OWNER'S requirements as to Performance and Payment Bonds. When the Successful BIDDER delivers the executed Agreement to OWNER, it must be accompanied by the required performance and payment Bonds.

18. SIGNING OF AGREEMENT

When OWNER gives a Notice of Award to the Successful BIDDER, it will be accompanied by the required number of unsigned counterparts of the Agreement with all other written Contract Documents attached. Within fifteen days thereafter CONTRACTOR shall sign and deliver the

required number of counterparts of the Agreement and attached documents to OWNER with the required Bonds. Within ten days thereafter OWNER shall deliver one fully signed counterpart to CONTRACTOR. Each counterpart is to be accompanied by a complete set of the Drawings with appropriate identification.

other terms and conditions of the Contract Documents, including specifically the provisions of Section 5.04 of the General Conditions; and no additional examinations, investigations, explorations, tests, reports or similar information or data are or will be required by BIDDER for such purposes.

- (e) BIDDER has reviewed and checked all information and data shown or indicated on the Contract Documents with respect to existing Underground Facilities at or contiguous to the site and assumes responsibility for the accurate location of said Underground Facilities. No additional examinations, investigations, explorations, tests, reports or similar information or data in respect of said Underground Facilities are or will be required by BIDDER in order to perform and furnish the Work at the Contract Price, within the Contract Time and in accordance with the other terms and conditions of the Contract Documents, including specifically the provisions of Section 5.04 of the General Conditions.
 - (f) BIDDER has correlated the results of all such observations, examinations, investigations, explorations, tests, reports and studies with the terms and conditions of the Contract Documents.
 - (g) BIDDER has given ENGINEER written notice of all conflicts, errors or discrepancies that it has discovered in the Contract Documents and the written resolution thereof by ENGINEER is acceptable to BIDDER.
 - (h) This Bid is genuine and not made in the interest of or on behalf of any undisclosed person, firm or corporation and is not submitted in conformity with any agreement or rules of any group, association, organization or corporation; BIDDER has not directly or indirectly induced or solicited any other BIDDER to submit a false or sham Bid; BIDDER has not solicited or induced any person, firm or corporation to refrain from bidding; and BIDDER has not sought by collusion to obtain for itself any advantage over any other BIDDER or over OWNER.
 - (i) (Any other representation required by Laws and Regulations.)
4. BIDDER will complete the Work for the following prices:

UNIT PRICE SCHEDULE

ITEM NO.	ITEM	UNIT	ESTIMATED QUANTITY	UNIT PRICE	TOTAL PRICE
1	MOBILIZATION	L.S.	1	\$ _____	\$ _____
2	TRAFFIC CONTROL	L.S.	1	\$ _____	\$ _____
3	TRAFFIC CONTROL SUPERVISOR	L.S.	1	\$ _____	\$ _____
4	EROSION CONTROL SUPERVISOR	L.S.	1	\$ _____	\$ _____
5	ABANDON WATERMAIN PIPE (ALL TYPES AND SIZES)	L.F.	1,000	\$ _____	\$ _____
6	REMOVE STORM SEWER PIPE (ALL TYPES AND SIZES)	L.F.	150	\$ _____	\$ _____
7	ABANDON STORM SEWER PIPE (ALL TYPES AND SIZES)	L.F.	60	\$ _____	\$ _____
8	REMOVE WATERMAIN PIPE (ALL TYPES AND SIZES)	L.F.	150	\$ _____	\$ _____
9	REMOVE CONCRETE CURB AND GUTTER	L.F.	1,250	\$ _____	\$ _____
10	REMOVE CONCRETE SIDEWALK & MEDIAN	S.Y.	132	\$ _____	\$ _____
11	REMOVE BITUMINOUS TRAIL	S.Y.	850	\$ _____	\$ _____
12	MILL BITUMINOUS SURFACE (1.5")	S.Y.	1,090	\$ _____	\$ _____
13	REMOVE SIGN	EACH	3	\$ _____	\$ _____
14	REMOVE DRAINAGE STRUCTURE	EACH	3	\$ _____	\$ _____
15	SALVAGE FIRE HYDRANT	EACH	2	\$ _____	\$ _____
16	SALVAGE GATE VALVE AND BOX	EACH	6	\$ _____	\$ _____
17	SALVAGE AND INSTALL SPRINKLER HEAD	EACH	20	\$ _____	\$ _____
18	SALVAGE SIGN	EACH	13	\$ _____	\$ _____
19	CLEARING	EACH	2	\$ _____	\$ _____
20	GRUBBING	EACH	2	\$ _____	\$ _____
21	COMMON EXCAVATION	C.Y.	4,107	\$ _____	\$ _____
22	SUBGRADE EXCAVATION	C.Y.	250	\$ _____	\$ _____
23	COMMON BORROW (CV)	C.Y.	439	\$ _____	\$ _____
24	DITCH GRADING	L.F.	418	\$ _____	\$ _____
25	SELECT GRANULAR BORROW (CV)	C.Y.	1,783	\$ _____	\$ _____
26	GEOTEXTILE FABRIC TYPE V	S.Y.	775	\$ _____	\$ _____
27	TEST ROLLING	Rd. Sta	28	\$ _____	\$ _____
28	CALCIUM CHLORIDE SOLUTION	GAL.	250	\$ _____	\$ _____
29	AGGREGATE BASE CL 5 (CV)	C.Y.	1,816	\$ _____	\$ _____
30	DRIVEWAY BASE, AGG. CL. 5	C.Y.	191	\$ _____	\$ _____
31	3 INCH MINUS RECYCLE MATERIAL	TON	100	\$ _____	\$ _____
32	BITUMINOUS PATCHING MIXTURE	TON	180	\$ _____	\$ _____
33	INSTALL BITUMINOUS TRAIL (3")	S.Y.	132	\$ _____	\$ _____
34	TYPE SPNWB330C BASE COURSE MIXTURE (2 1/2")	S.Y.	4,348	\$ _____	\$ _____
35	TYPE SPWEA340C WEARING COURSE MIXTURE (1 1/2")	S.Y.	5,438	\$ _____	\$ _____

UNIT PRICE SCHEDULE

ITEM NO.	ITEM	UNIT	ESTIMATED QUANTITY	UNIT PRICE	TOTAL PRICE
36	TACK COAT	GAL.	219	\$ _____	\$ _____
37	WATER FOR DUST CONTROL	MGAL	500	\$ _____	\$ _____
38	6" PE STREET DRAINTILE W/SOCK	L.F.	2,407	\$ _____	\$ _____
39	CONNECT DRAINTILE TO STORM SEWER STRUCTURE	EACH	17	\$ _____	\$ _____
40	CONNECT RC PIPE TO EXISTING STORM SEWER STRUCTURE	EACH	2	\$ _____	\$ _____
41	INSULATE STORM SEWER (4")	SY	153	\$ _____	\$ _____
42	8" PVC PIPE SDR26	L.F.	15.0	\$ _____	\$ _____
43	12" PVC PIPE SDR26	L.F.	27.0	\$ _____	\$ _____
44	12" RC PIPE STORM SEWER, CL.III	L.F.	32.6	\$ _____	\$ _____
45	15" RC PIPE STORM SEWER, CL. IV	L.F.	330.9	\$ _____	\$ _____
46	18" RC ARCH PIPE STORM SEWER, CL.V	L.F.	98.5	\$ _____	\$ _____
47	30" RC PIPE STORM SEWER, CL. V	L.F.	32.6	\$ _____	\$ _____
48	10" PVC PIPE APRON	EACH	1	\$ _____	\$ _____
49	12" PVC PIPE APRON	EACH	1	\$ _____	\$ _____
50	15" RC PIPE APRON	EACH	3	\$ _____	\$ _____
51	15" RC PIPE SAFETY APRON	EACH	2	\$ _____	\$ _____
52	18" RC ARCH PIPE SAFETY APRON	EACH	2	\$ _____	\$ _____
53	30" RC PIPE SAFETY APRON W/ GRATE	EACH	1	\$ _____	\$ _____
54	AGGREGATE BEDDING	TON	225	\$ _____	\$ _____
55	CB TYPE ST-2	L.F.	15.90	\$ _____	\$ _____
56	MH TYPE ST-6 (48" DIAMETER)	L.F.	42.73	\$ _____	\$ _____
57	CB CASTING TYPE R-3067	EACH	16	\$ _____	\$ _____
58	CB CASTING TYPE R-3290-A	EACH	1	\$ _____	\$ _____
59	HAND PLACED RIP RAP CL III	TON	74	\$ _____	\$ _____
60	INSTALL MANHOLE SEALING SYSTEM	EACH	5	\$ _____	\$ _____
61	TEMPORARY WATERMAIN	L.S.	1	\$ _____	\$ _____
62	6" PVC WM C900	L.F.	123	\$ _____	\$ _____
63	10" HDPE WM SDR 11 (BY DIRECTIONAL DRILLING)	L.F.	985	\$ _____	\$ _____
64	10" PVC WM C900	L.F.	50	\$ _____	\$ _____
65	F & I 6" GATE VALVE & BOX	EACH	4	\$ _____	\$ _____
66	F & I 8" GATE VALVE & BOX	EACH	4	\$ _____	\$ _____
67	WET TAP TO EXISTING WATER MAIN	EACH	1	\$ _____	\$ _____
68	CONNECT TO EXISTING WATER MAIN	EACH	1	\$ _____	\$ _____
69	1" HDPE SERVICE PIPE	EACH	2	\$ _____	\$ _____
70	1" CORPORATION STOP	EACH	2	\$ _____	\$ _____
71	REMOVE & REPLACE CURB STOP W/ STANDPIPE	EACH	2	\$ _____	\$ _____
72	F & I HYDRANT & VALVE	EACH	3	\$ _____	\$ _____

UNIT PRICE SCHEDULE

ITEM NO.	ITEM	UNIT	ESTIMATED QUANTITY	UNIT PRICE	TOTAL PRICE
73	ADJUST GATE VALVE	EACH	1	\$ _____	\$ _____
74	ADJUST FRAME & RING CASTING	EACH	3	\$ _____	\$ _____
75	MANHOLE/CATCH BASIN REPAIR	L.F.	8	\$ _____	\$ _____
76	CONCRETE SIDEWALK & MEDIAN (4")	SF	585	\$ _____	\$ _____
77	CONCRETE PED. RAMPS (TRUNCATED DOME)	EACH	1	\$ _____	\$ _____
78	CONCRETE CURB & GUTTER DESIGN B612	L.F.	648	\$ _____	\$ _____
79	CONCRETE CURB & GUTTER DESIGN B618	L.F.	2,891	\$ _____	\$ _____
80	CONCRETE CURB & GUTTER DESIGN B624	L.F.	145	\$ _____	\$ _____
81	INSTALL CONCRETE CURB & GUTTER, TYPE V	LF	25	\$ _____	\$ _____
82	INSTALL 8" CONCRETE DRIVEWAY PAVEMENT	S.Y.	205	\$ _____	\$ _____
83	WATER FOR TURF ESTABLISHMENT	MGAL	100	\$ _____	\$ _____
84	COMMERCIAL FERT. ANALYSIS 5-15-10	L.b.	138	\$ _____	\$ _____
85	SOD: TYPE LAWN & BOULEVARD	S.Y.	575	\$ _____	\$ _____
86	SEEDING: MN/DOT MIX 25-141	S.Y.	1,500	\$ _____	\$ _____
87	HYDROSEEDING: MD/DOT MIX 25-141	S.Y.	592	\$ _____	\$ _____
88	HYDROSEEDING: MN/DOT MIX 25-151	S.Y.	606	\$ _____	\$ _____
89	HYDROSEEDING: MN/DOT MIX 33-161	S.Y.	70	\$ _____	\$ _____
90	LANDSCAPE ROCK	TON	27	\$ _____	\$ _____
91	EROSION CONTROL BLANKET 3N	S.Y.	1,500	\$ _____	\$ _____
92	SILT FENCE	L.F.	275	\$ _____	\$ _____
93	INLET PROTECTION-TYPE SPECIAL	EACH	20	\$ _____	\$ _____
94	F&I TREE, AUTUMN SPRIE MAPLE, 2" B&B	EACH	2	\$ _____	\$ _____
95	F&I TREE, BLACK HILLS SPRUCE, 2" B&B	EACH	2	\$ _____	\$ _____
TOTAL BASE BID					\$ _____

Quantities are not guaranteed. Final payment will be based on actual quantities.

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

BIDDER accepts the provisions of the Agreement as to liquidated damages in the event of failure to complete the Work on time.

6. The following documents are attached to and made a condition of this BID:

- (a) Required Bid Security in the form of (Bidder's Bond) (Certified Check).
- (b) A tabulation of Subcontractors, Suppliers and other persons and organizations required to be identified in this Bid.
- (c) Affidavit of Non-Collusion.

(d) (Add other documents as pertinent).

7. Communications concerning this Bid shall be addressed to the address of BIDDER indicated below.
8. The terms used in this Bid which are defined in the General Conditions of the Construction Contract included as part of the Contract Documents have the meanings assigned to them in the General Conditions.

SUBMITTED on _____, **2018**.

If BIDDER is:

An Individual

By _____ (SEAL)
(Individual's Name)

doing business as _____

Phone No: _____

A Partnership

By _____ (SEAL)
(Firm Name)

(General Partner)

Business Address: _____

Phone No: _____

A Corporation

By _____
(Corporation Name)

(State of Incorporation)

By _____
(Name of Person Authorized to Sign)

(Title)

(Corporate Seal)

Attest _____
(Secretary)

Business Address: _____

Phone No: _____

A Joint Venture

By _____

(Name)

(Address)

(Phone Number)

By

(Name)

(Address)

(Phone Number)

(Each joint venturer must sign. The manner of signing for each individual, partnership and corporation that is a party to the joint venture should be in the manner indicated above).

STATE OF _____

COUNTY OF _____

AFFIDAVIT OF NON-COLLUSION

I hereby swear (or affirm) under the penalty of perjury:

- 1) That I am the BIDDER (if the BIDDER is an individual), a partner in the BIDDER (if the BIDDER is a partnership) or an officer or employee of the BIDDER corporation having authority to sign on its behalf (if the BIDDER is a corporation);

- 2) That the attached Bid or Bids have been arrived at by the BIDDER individually and have been submitted without collusion with, and without any agreement, understanding or planned common course of action with any other vendor of materials, supplies, equipment or services described in the invitation to Bid designed to limit individual bidding or competition;

- 3) That the contents of the Bid or Bids have not been communicated by the BIDDER or its employees or agents to any person not an employee or agent of the BIDDER or its surety on any bond furnished with the Bid or Bids, and will not be communicated to any such person, prior to any official opening of the Bid or Bids; and

- 4) That I have fully informed myself regarding the accuracy of the statements made in this affidavit.

Subscribed and sworn to before me _____
(Bidder)

this ____ day of _____, 2018 _____
(Firm making Bid or Bids)

OFFICIAL TITLE: _____

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

THIS AGREEMENT is dated as of the ____ day of _____ in the year **2018** by and between the **CITY OF PLYMOUTH, MINNESOTA** (hereinafter called OWNER) and _____ (hereinafter called CONTRACTOR).

OWNER and CONTRACTOR, in consideration of the mutual covenants set forth herein, 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:

- A. Street Reconstruction

ARTICLE 2 - THE PROJECT

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

HWY 55 FRONTAGE ROAD RECONSTRUCTION
CITY OF PLYMOUTH, MINNESOTA
CITY PROJECT NO. 13002

ARTICLE 3 - ENGINEER

3.01 The Project has been designed by the City Engineering Department who is hereinafter called ENGINEER and who is to act as OWNER'S representative, assume all duties and responsibilities and have the rights and authority assigned to ENGINEER in the Contract Documents in connection with completion of the Work in accordance with the Contract Documents.

ARTICLE 4 - CONTRACT TIMES

4.01 Time of the Essence

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

4.02 Dates for beginning construction, Substantial Completion and Final Payment

- A. Construction operations shall be started within 14 calendar days after the date of contract approval.
- B. The Work will be substantially completed on or before August 31, 2018. Substantial completion includes all work except restoration. Project shall be completed and ready for final payment in accordance with Section 15.06 by September 28, 2018.

4.03 Liquidated Damages

- A. CONTRACTOR and OWNER recognize that time is of the essence of this Agreement and that OWNER will suffer financial loss if the Work is not completed within the times specified in Paragraph 4.02 above, plus any extensions thereof allowed in accordance with Article 12 of the General Conditions. The parties also recognize the delays, expense, and difficulties involved in proving in a legal or arbitration preceding the actual loss suffered by OWNER if the Work is not completed on time. Accordingly, instead of requiring any such proof, OWNER and CONTRACTOR agree that as liquidated damages for delay (but not as a penalty), CONTRACTOR shall pay OWNER ONE THOUSAND TWO HUNDRED dollars (\$1200.00) for each day that expires after the time specified in Paragraph 4.02 for Substantial Completion until the Work is substantially complete. After Substantial Completion, if CONTRACTOR shall neglect, refuse, or fail to complete the remaining Work within the Contract Time or any proper extension thereof granted by OWNER, CONTRACTOR shall pay OWNER ONE THOUSAND TWO HUNDRED dollars (\$1200.00) for each day that expires after the time specified in Paragraph 4.02 for completion and readiness for final payment until the Work is completed and ready for final payment.

ARTICLE 5 - CONTRACT PRICE

- 5.01 OWNER shall pay CONTRACTOR for completion of the Work in accordance with the Contract Documents an amount in current funds at the unit prices as shown on the attached CONTRACTOR'S Bid multiplied by the final quantities. As provided in Paragraph [13.03](#) of the [General Conditions](#), estimated quantities are not guaranteed and determination of actual quantities and classifications are to be made by the ENGINEER in accordance with Paragraph 10.06 of the General Conditions.

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 account of the Contract Price on the basis of CONTRACTOR'S Applications for Payment on or about the first day of each month during performance of the Work as provided in Paragraphs 6.02.A.1 and 6.02.A.2 below. All such payments will be measured by the schedule of values established as provided in Paragraph 2.05.A of the General Conditions (and in the case of Unit Price Work based on the number of units completed) or, in the event there is no schedule of values, as provided in the General Requirements:
1. Prior to Substantial Completion, progress payments will be made in an amount equal to the percentage indicated below but, in each case, less the aggregate of payments previously made and less such amounts as ENGINEER may determine or OWNER may withhold, including but not limited to liquidated damages, in accordance with Paragraph 14.02 of the General Conditions:
 - a. 95% percent of work completed (with the balance being retainage). If the Work has been 50 percent completed as determined by ENGINEER, and if the character and progress of the Work have been satisfactory to OWNER and ENGINEER, OWNER, on recommendation of ENGINEER, may determine that as long as the character and progress of the Work remain satisfactory to them, there will be no additional retainage; and

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

6.03 Final Payment

- A. Upon final completion and acceptance of the Work in accordance with Paragraph 14.07 of the General Conditions, OWNER shall pay the remainder of the Contract Price as recommended by ENGINEER as provided in said Paragraph 14.07.
- B. Form IC-134 required from Minn. Stat. § 290.92 requires that the City of Plymouth obtain Withholding Affidavit for Contractors, Form IC-134, before making final payment to contractors. This form needs to be submitted by the CONTRACTOR to the MN Department of Revenue for approval.

This form is used to receive certification from the state that the vendor has complied with the requirement to withhold and remit state withholding taxes for employee paid salaries.

6.04 Prompt Payment To Subcontractors

- A. Pursuant to Minn. Stat. § 471.425, Subd. 4a, the CONTRACTOR must pay any subcontractor within ten (10) days of the CONTRACTOR'S receipt of payment from the City for undisputed services provided by the subcontractor. The CONTRACTOR must pay interest of 1½ percent per month or any part of a month to the subcontractor on any undisputed amount not paid on time to the subcontractor. The minimum monthly interest penalty payment for an unpaid balance of \$100.00 or more is \$10.00. For an unpaid balance of less than \$100.00, the CONTRACTOR shall pay the actual penalty due to the subcontractor.

ARTICLE 7 - INTEREST

- 7.01 All moneys not paid when due as provided in Article 15 of the General Conditions shall bear interest at the maximum rate allowed by the law at the place of the Project.

ARTICLE 8 – CONTRACTOR'S REPRESENTATIONS

8.01 In order to induce OWNER to enter into this Agreement CONTRACTOR makes the following representations:

- A. CONTRACTOR has examined and carefully studied the Contract Documents and the other related data identified in the Bidding Documents.
- B. CONTRACTOR has visited the Site and become familiar with and is satisfied as to the general, local, and Site conditions that may affect cost, progress, and performance of the Work.
- C. CONTRACTOR is familiar with and is satisfied as to all federal, state, and local Laws and Regulations that may affect cost, progress, and performance of the Work.
- D. CONTRACTOR has carefully studied all: (1) reports of explorations and tests of subsurface conditions at or contiguous to the Site and all drawings of physical conditions in or relating to existing surface or subsurface structures at or contiguous to the Site (except Underground Facilities) which have been identified in the Supplementary Conditions as provided in Paragraph 4.02 of the General Conditions and (2) reports and drawings of a Hazardous Environmental Condition, if any, at the Site which has been identified in the Supplementary Conditions as provided in Paragraph 4.06 of the General Conditions.

- E. CONTRACTOR has obtained and carefully studied (or assumes responsibility for doing so) all additional or supplementary examinations, investigations, explorations, tests, studies, and data concerning conditions (surface, subsurface, and Underground Facilities) at or contiguous to the Site which may affect cost, progress, or performance of the Work or which relate to any aspect of the means, methods, techniques, sequences, and procedures of construction to be employed by CONTRACTOR, including any specific means, methods, techniques, sequences, and procedures of construction expressly required by the Bidding Documents, and safety precautions and programs incident thereto.
- F. CONTRACTOR does not consider that any further examinations, investigations, explorations, tests, studies, or data are necessary for the performance of the Work at the Contract Price, within the Contract Times, and in accordance with the other terms and conditions of the Contract Documents.
- G. CONTRACTOR is aware of the general nature of work to be performed by OWNER and others at the Site that relates to the Work as indicated in the Contract Documents.
- H. CONTRACTOR has correlated the information known to CONTRACTOR, information and observations obtained from visits to the Site, reports and drawings identified in the Contract Documents, and all additional examinations, investigations, explorations, tests, studies, and data with the Contract Documents.
- I. CONTRACTOR has given ENGINEER written notice of all conflicts, errors, ambiguities, or discrepancies that CONTRACTOR has discovered in the Contract Documents, and the written resolution thereof by ENGINEER is acceptable to CONTRACTOR.
- J. The Contract Documents are generally sufficient to indicate and convey understanding of all terms and conditions for performance and furnishing of the Work.

ARTICLE 9 - CONTRACT DOCUMENTS

9.01 Contents

- A. The Contract Documents consist of the following:
 - 1. This Agreement (pages A-1 to A-6 , inclusive).
 - 2. Performance and other bonds, identified as exhibits B and consisting of 6 pages.
 - 3. Notice of Award.
 - 4. General Conditions (pages 1 to 63 , inclusive).
 - 5. Supplementary Conditions (pages SC 1 to SC 10 , inclusive).
 - 6. Specifications as listed in the table of contents of the Project Manual.
 - 7. Drawings consisting of a cover sheet and sheets numbered 1 through 41 , inclusive with each sheet bearing the following general title: **HWY 55 FRONTAGE ROAD RECONSTRUCTION, C.P. 13002.**
 - 8. Addenda (numbers _____ to _____, inclusive).
 - 9. Exhibits to this Agreement (enumerated as follows):
 - a. CONTRACTOR'S Bid (pages 1 to 9 , inclusive).

- b. Documentation submitted by CONTRACTOR prior to Notice of Award (pages _____ to _____, inclusive).
 - c. Certificate of Insurance
10. The following which may be delivered or issued on or after the Effective Date of the Agreement and are not attached hereto:
- a. Written Amendments.
 - b. Work Change Directives.
 - c. Change Order(s).
- B. The documents listed in Paragraph 9.01.A are attached to this Agreement (except as expressly noted otherwise above).
- C. There are no Contract Documents other than those listed above in this Article 9.
- D. The Contract Documents may only be amended, modified, or supplemented as provided in Articles 3 and 11 of the General Conditions.

ARTICLE 10 - MISCELLANEOUS

10.01 Terms

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

10.02 Assignment of Contract

- A. No assignment by a party hereto of any rights under or interests in the Contract will be binding on another party hereto without the written consent of the party sought to be bound; and, specifically but without limitation, moneys that may become due and moneys that are due may not be assigned without such consent (except to the extent that the effect of this restriction may be limited by law), and unless specifically stated to the contrary in any written consent to an assignment, no assignment will release or discharge the assignor from any duty or responsibility under the Contract Documents.

10.03 Successors and Assigns

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

10.04 Severability

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

IN WITNESS WHEREOF, OWNER and CONTRACTOR have signed this Agreement in triplicate. One counterpart each has been delivered to OWNER, CONTRACTOR and ENGINEER. All portions of the Contract Documents have been signed or identified by OWNER and CONTRACTOR or by ENGINEER on their behalf.

This Agreement will be effective on _____, **2018**.

OWNER CITY OF PLYMOUTH

CONTRACTOR _____

By _____ By _____

Title: MAYOR Title _____

By _____ By _____

Title: CITY MANAGER Title _____

(CORPORATE SEAL)

(CORPORATE SEAL)

Attest _____ Attest _____

Address for giving notices: Address for giving notices:

3400 Plymouth Boulevard _____

Plymouth, MN 55447 _____

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

License No. _____

Agent for service of process _____

(If CONTRACTOR is a corporation, attach evidence of authority to sign.)

NOTICE TO PROCEED
PLYMOUTH, MINNESOTA
HWY 55 FRONTAGE ROAD RECONSTRUCTION
CITY PROJECT NO. 13002

TO: _____

ADDRESS: _____

You are hereby notified to proceed with the Work on the above project. The Contract Times, as described in Article 4 of the Agreement, will commence to run on _____.

Prior to starting any work on the site, the following must be completed:

1. _____
2. _____
3. _____

GIVEN BY:

ACCEPTED BY:

CITY OF PLYMOUTH
Owner

Contractor

Signature

Signature

Title

Title

Date

Date

CONTRACTOR'S PERFORMANCE BOND

KNOW ALL MEN BY THESE PRESENTS, that _____ as Principal, hereinafter called CONTRACTOR, and _____ as Surety, hereinafter called Surety, are held and firmly bound onto the City of Plymouth as Obligee, hereinafter called OWNER, in the amount of _____ Dollars (written), (\$ _____), for the payment whereof CONTRACTOR and Surety bind themselves, their heirs, executors, administrators, successors, and assigns, jointly and severally firmly by these presents.

WHEREAS,

CONTRACTOR has by written Agreement dated _____, **2018**. entered into a Contract with OWNER for construction of the HWY 55 FRONTAGE ROAD RECONSTRUCTION PROJECT, City Project No. 13002 in accordance with Contract Documents prepared by The City's Engineering Department which Contract is by reference made a part hereof, and is hereinafter referred to as the Agreement.

NOW, THEREFORE, THE CONDITION OF THIS OBLIGATION is such that, if CONTRACTOR shall promptly and faithfully perform said Agreement, then this obligation shall be null and void; otherwise it shall remain in full force and effect.

The Surety hereby waives notice of any alteration or extension of time by OWNER.

Whenever CONTRACTOR shall be, and declared by OWNER to be, in default under the Agreement, the OWNER, having performed OWNER'S obligations there under, the Surety may promptly remedy the default, or shall promptly:

1. Complete the contract in accordance with its terms and conditions, or
2. Obtain a Bid or Bids for completing the Contract in accordance with its terms and conditions, and upon determination by Surety of the lowest responsible Bidder, or if OWNER elects, upon determination by OWNER and the Surety jointly of the lowest responsible Bidder, arrange for a Contract between such Bidder and OWNER, and make available as Work progresses (even though there should be a default or a succession of defaults under the Contract or Contracts of completion arranged under this paragraph) sufficient funds to pay the cost of completion less the balance of the Contract Price," but not exceeding, including other costs and damages for which the Surety may be liable hereunder, the amount set forth in the first paragraph hereof. The term "balance of the Contract Price", as used in this paragraph, shall mean the total amount payable by OWNER to CONTRACTOR under the Contract and any amendments thereto, less the amount properly paid by the OWNER to CONTRACTOR.

No right of action shall accrue on this bond to or for the use of any person or corporation other than OWNER named herein or the heirs, executors, administrators or successors of OWNER.

IN WITNESS WHEREFORE, the above-bounded parties have executed this instrument in _____ original counterparts, under their several seals this day of _____, **2018**, the names and corporate seal of each corporate party being hereto affixed and these presents duly signed by its undersigned representative, pursuant to authority of its governing body.

(Affix Corporate Seal)

(Contractor)

Attest:

(Business Address)

(Title)

By: _____
(Title)

(Affix Corporate Seal)

(Surety)

Attest:

(Business Address)

(Attorney in Fact)

CERTIFICATE OF ACKNOWLEDGMENT BY PRINCIPAL

(For use where Contractor is Individual or Partnership)

STATE OF MINNESOTA _____)
COUNTY OF _____)SS

On this _____ day of _____, **2018**, before me personally appeared _____, to me known to be the person _____ described in and who executed the foregoing conditions, and acknowledged that he/she _____ executed the same as _____ free act and deed.

Notary Public

(Notarial Seal)

CERTIFICATE OF ACKNOWLEDGMENT

(For use where Contractor is a Corporation)

STATE OF MINNESOTA _____)
COUNTY OF _____)SS

On this _____ day of _____, **2018**, before me personally appeared _____ and _____ to me personally know, who being by me duly sworn, did say that they are respectively the _____ that the seal affixed to the foregoing instrument is the corporate seal of said corporation, and that said instrument was executed in behalf of the corporation by authority of its _____ Board of _____ Directors, and said _____ and _____ acknowledged the instrument to be the free act and deed of said corporation.

Notary Public

(Notarial Seal)

_____ Full Name of Surety Company	_____ Home Office Address
_____ Name of Attorney-in-Fact	_____ Name of Local Agency
_____ Address of Local Agency	_____ Name of Agency Affixing Countersignature
	_____ Address

MEMORANDUM: Affix here Power of Attorney and Acknowledgment of Corporate Surety.

CONTRACTOR'S PAYMENT BOND
(PUBLIC IMPROVEMENT)

KNOW ALL MEN BY THESE PRESENTS that _____ as Principal,
hereinafter called CONTRACTOR, and

_____ duly authorized and licensed to do business
in the State of Minnesota, as Surety, hereinafter called Surety, are held and firmly bound onto the City of
Plymouth as Obligee, hereinafter called OWNER, for the use and benefit of claimants as hereinafter provided
in the amount of _____ Dollars (written), (\$
) , for the payment whereof CONTRACTOR and Surety bind themselves, their heirs, executors,
administrators, successors, and assigns, jointly and severally, firmly by these presents.

WHEREAS,

CONTRACTOR has by written Agreement dated _____, **2018**. entered into a
Contract with OWNER for construction of the HWY 55 FRONTAGE ROAD RECONSTRUCTION PROJECT,
City Project No. 13002 in accordance with Contract Documents prepared by The City's Engineering
Department which Contract is by reference made a part hereof, and is to contain in substance the following
provisions:

CONTRACTOR shall pay all claims for labor performed and materials furnished, used or consumed in making
the public improvement or performing the public Work, including, without limitation because of specific
enumeration, fuel, lumber, building materials, machinery, vehicles, tractors, equipment, fixtures,
apparatus, tools, appliances, supplies, electric energy, gasoline, motor oil, lubricating oil, greases,
premiums for worker's compensation insurance, and contributions for unemployment compensation.

The said written agreement, drawings, specifications, and amendments are hereinafter referred to as the
Contract.

NOW, THEREFORE, THE CONDITION OF THIS OBLIGATION is such that, if CONTRACTOR shall faithfully
perform the said Contract and pay every person entitled thereto for all the claims for labor performed and
materials furnished under the Contract to be used or consumed in making the public improvement or
performing the public Work as provided in the Contract, then this obligation shall be null and void; otherwise
it shall remain in full force and effect, subject, however, to the following conditions:

1. No assignment, modification or change of the Agreement, or change in the Work covered thereby, or
any extension of time for completion of the Contract shall release the Sureties on the bond.
2. Not later than one year after the completion of Work under this Contract or such longer period of
time as may be prescribed by law, or by the terms of any applicable special guarantee required by
the Contract Documents or by any specific provision of the Contract Documents, any party in interest
may maintain an action in his own name against CONTRACTOR and the Surety upon this bond for
the recovery of any damages he may have sustained by reason of the failure of CONTRACTOR to
comply with the Contract or with the Contract between CONTRACTOR and his Subcontractors. If the
amount realized on this bond is insufficient to satisfy all claims of the parties in full, it shall be
distributed among the parties pro rata.

IN WITNESS WHEREOF, the above-bounded parties have executed this instrument in original counterparts,
under their several seals this _____ day of _____, **2018**, the
names and corporate seal of each corporate party being hereto affixed and these presents duly signed by
its undersigned representative, pursuant to authority of its governing body.

(Affix Corporate Seal)

(Contractor)

Attest:

(Business Address)

(Title)

By: _____
(Title)

(Affix Corporate Seal)

(Surety)

Attest:

(Business Address)

(Attorney in Fact)

CERTIFICATE OF ACKNOWLEDGMENT BY PRINCIPAL

(For use where Contractor is Individual or Partnership)

STATE OF MINNESOTA _____)
COUNTY OF _____)SS

On this _____ day of _____, **2018**, before me personally appeared _____, to me known to be the person _____ described in and who executed the foregoing conditions, and acknowledged that he/she _____ executed the same as _____ free act and deed.

Notary Public

(Notarial Seal)

CERTIFICATE OF ACKNOWLEDGMENT

(For use where Contractor is a Corporation)

STATE OF MINNESOTA _____)
COUNTY OF _____)SS

On this _____ day of _____, **2018**, before me personally appeared _____ and _____ to me personally know, who being by me duly sworn, did say that they are respectively the _____ that the seal affixed to the foregoing instrument is the corporate seal of said corporation, and that said instrument was executed in behalf of the corporation by authority of its _____ Board of _____ Directors, and said _____ and _____ acknowledged the instrument to be the free act and deed of said corporation.

Notary Public

(Notarial Seal)

_____ Full Name of Surety Company	_____ Home Office Address
_____ Name of Attorney-in-Fact	_____ Name of Local Agency
_____ Address of Local Agency	_____ Name of Agency Affixing Countersignature
	_____ Address

MEMORANDUM: Affix here Power of Attorney and Acknowledgment of Corporate Surety.

STANDARD GENERAL CONDITIONS OF THE CONSTRUCTION CONTRACT

Prepared by



Issued and Published Jointly by



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**STANDARD GENERAL CONDITIONS OF THE
CONSTRUCTION CONTRACT**

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Note:
Some sections in this document have been revised. Revisions are shown as red, italicized text.

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 form acceptable to Engineer which is to be used by Contractor during the course of the Work in requesting progress or final payments and which is to be accompanied by such supporting documentation as is required by the Contract Documents.
 4. *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, or both; 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, or both; 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; or (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. 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), hazardous waste, and any substance, product, waste, or other material of any nature whatsoever that is or becomes listed, regulated, or addressed pursuant to (a) the Comprehensive Environmental Response, Compensation and Liability Act, 42 U.S.C. §§9601 et seq. ("CERCLA"); (b) the Hazardous Materials Transportation Act, 49 U.S.C. §§5501 et seq.; (c) the Resource

Conservation and Recovery Act, 42 U.S.C. §§6901 et seq. (“RCRA”); (d) the Toxic Substances Control Act, 15 U.S.C. §§2601 et seq.; (e) the Clean Water Act, 33 U.S.C. §§1251 et seq.; (f) the Clean Air Act, 42 U.S.C. §§7401 et seq.; or (g) any other federal, state, or local statute, law, rule, regulation, ordinance, resolution, code, order, or decree 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 the 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. *Engineer*—The individual or entity named as such in the Agreement.
21. *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.
22. *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. The presence at the Site of materials that are necessary for the execution of the Work, or that are to be incorporated in the Work, and that are controlled and contained pursuant to industry practices, Laws and Regulations, and the requirements of the Contract, does not establish a Hazardous Environmental Condition.
23. *Laws and Regulations; Laws or Regulations*—Any and all applicable laws, statutes, rules, regulations, ordinances, codes, and orders of any and all governmental bodies, agencies, authorities, and courts having jurisdiction.
24. *Liens*—Charges, security interests, or encumbrances upon Contract-related funds, real property, or personal property.
25. *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.
26. *Notice of Award*—The written notice by Owner to a Bidder of Owner’s acceptance of the Bid.
27. *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.

28. *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.
29. *Progress Schedule*—A schedule, prepared and maintained by Contractor, describing the sequence and duration of the activities comprising the Contractor’s plan to accomplish the Work within the Contract Times.
30. *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.
31. *Project Manual*—The written documents prepared for, or made available for, procuring and constructing the Work, including but not limited to the Bidding Documents or other construction procurement documents, geotechnical and existing conditions information, the Agreement, bond forms, General Conditions, Supplementary Conditions, and Specifications. The contents of the Project Manual may be bound in one or more volumes.
32. *Resident Project Representative*—The authorized representative of Engineer assigned to assist Engineer at the Site. As used herein, the term Resident Project Representative or “RPR” includes any assistants or field staff of Resident Project Representative.
33. *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.
34. *Schedule of Submittals*—A schedule, prepared and maintained by Contractor, of required submittals and the time requirements for Engineer’s review of the submittals and the performance of related construction activities.
35. *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.
36. *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.
37. *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 furnished by Owner which are designated for the use of Contractor.
38. *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.
39. *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.
40. *Substantial Completion*—The time at which the Work (or a specified part thereof) has progressed to the point where, in the opinion of Engineer, the Work (or a specified part thereof) is sufficiently complete, in accordance with the Contract Documents, so that the Work (or a specified part thereof) can be utilized for the purposes for which it is intended. The terms “substantially complete” and “substantially completed” as applied to all or part of the Work refer to Substantial Completion thereof.

41. *Successful Bidder*—The Bidder whose Bid the Owner accepts, and to which the Owner makes an award of contract, subject to stated conditions.
42. *Supplementary Conditions*—The part of the Contract that amends or supplements these General Conditions.
43. *Supplier*—A manufacturer, fabricator, supplier, distributor, materialman, or vendor having a direct contract with Contractor or with any Subcontractor to furnish materials or equipment to be incorporated in the Work by Contractor or a Subcontractor.
44. *Technical Data*—Those items expressly identified as Technical Data in the Supplementary Conditions, with respect to either (a) subsurface conditions at the Site, or physical conditions relating to existing surface or subsurface structures at the Site (except Underground Facilities) or (b) Hazardous Environmental Conditions at the Site. If no such express identifications of Technical Data have been made with respect to conditions at the Site, then the data contained in boring logs, recorded measurements of subsurface water levels, laboratory test results, and other factual, objective information regarding conditions at the Site that are set forth in any geotechnical or environmental report prepared for the Project and made available to Contractor are hereby defined as Technical Data with respect to conditions at the Site under Paragraphs 5.03, 5.04, and 5.06.
45. *Underground Facilities*—All underground pipelines, conduits, ducts, cables, wires, manholes, vaults, tanks, tunnels, or other such facilities or attachments, and any encasements containing such facilities, including but not limited to those that convey electricity, gases, steam, liquid petroleum products, telephone or other communications, fiber optic transmissions, cable television, water, wastewater, storm water, other liquids or chemicals, or traffic or other control systems.
46. *Unit Price Work*—Work to be paid for on the basis of unit prices.
47. *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.
48. *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 the following paragraphs are not defined but, when used in the Bidding Requirements or Contract Documents, have the indicated meaning.
- B. *Intent of Certain Terms or Adjectives*:
 1. The Contract Documents include the terms “as allowed,” “as approved,” “as ordered,” “as directed” or terms of like effect or import to authorize an exercise of professional judgment by Engineer. In addition, the adjectives “reasonable,” “suitable,” “acceptable,” “proper,” “satisfactory,” or adjectives of like effect or import are used to describe an action or determination of Engineer as to the Work. It is intended that such exercise of professional judgment, action, or determination will be solely to evaluate, in general, the Work for compliance with the information in the Contract Documents and with the design concept of the Project as a functioning whole as shown or indicated in the Contract Documents (unless there is a specific

statement indicating otherwise). The use of any such term or adjective is not intended to and shall not be effective to assign to Engineer any duty or authority to supervise or direct the performance of the Work, or any duty or authority to undertake responsibility contrary to the provisions of Article 10 or any other provision of the Contract Documents.

C. *Day:*

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

D. *Defective:*

1. The word “defective,” when modifying the word “Work,” refers to Work that is unsatisfactory, faulty, or deficient in that it:
 - a. does not conform to the Contract Documents; or
 - b. does not meet the requirements of any applicable inspection, reference standard, test, or approval referred to in the Contract Documents; or
 - c. has been damaged prior to Engineer’s recommendation of final payment (unless responsibility for the protection thereof has been assumed by Owner at Substantial Completion in accordance with Paragraph 15.03 or 15.04).

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

1. The word “furnish,” when used in connection with services, materials, or equipment, shall mean to supply and deliver said services, materials, or equipment to the Site (or some other specified location) ready for use or installation and in usable or operable condition.
2. The word “install,” when used in connection with services, materials, or equipment, shall mean to put into use or place in final position said services, materials, or equipment complete and ready for intended use.
3. The words “perform” or “provide,” when used in connection with services, materials, or equipment, shall mean to furnish and install said services, materials, or equipment complete and ready for intended use.
4. 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. Unless stated otherwise in the Contract Documents, words or phrases that have a well-known technical or construction industry or trade meaning are used in the Contract Documents in accordance with such recognized meaning.

ARTICLE 2 – PRELIMINARY MATTERS

2.01 *Delivery of Bonds and Evidence of Insurance*

- A. *Bonds:* When Contractor delivers the executed counterparts of the Agreement to Owner, Contractor shall also deliver to Owner such bonds as Contractor may be required to furnish.
- B. *Evidence of Contractor’s Insurance:* When Contractor delivers the executed counterparts of the Agreement to Owner, Contractor shall also deliver to Owner, with copies to each named insured and additional insured (as identified in the Supplementary Conditions or elsewhere in the Contract), the certificates and other evidence of insurance required to be provided by Contractor in accordance with Article 6.

- C. *Evidence of Owner's Insurance:* After receipt of the executed counterparts of the Agreement and all required bonds and insurance documentation, Owner shall promptly deliver to Contractor, with copies to each named insured and additional insured (as identified in the Supplementary Conditions or otherwise), 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 executed 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 specifically 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 *Initial Acceptance of Schedules*

- A. At least 10 days before submission of the first Application for Payment a conference, attended by Contractor, Engineer, and others as appropriate, will be held to review for acceptability to Engineer as provided below the schedules submitted in accordance with Paragraph 2.03.A. Contractor shall have an additional 10 days to make corrections and adjustments and to complete and resubmit the schedules. No progress payment shall be made to Contractor until acceptable schedules are submitted to Engineer.
 - 1. The Progress Schedule will be acceptable to Engineer if it provides an orderly progression of the Work to completion within the Contract Times. Such acceptance will not impose on Engineer

responsibility for the Progress Schedule, for sequencing, scheduling, or progress of the Work, nor interfere with or relieve Contractor from Contractor's full responsibility therefor.

2. Contractor's Schedule of Submittals will be acceptable to Engineer if it provides a workable arrangement for reviewing and processing the required submittals.
3. Contractor's Schedule of Values will be acceptable to Engineer as to form and substance if it provides a reasonable allocation of the Contract Price to the component parts of the Work.

2.06 *Electronic Transmittals*

- A. Except as otherwise stated elsewhere in the Contract, the Owner, Engineer, and Contractor may transmit, and shall accept, Project-related correspondence, text, data, documents, drawings, information, and graphics, including but not limited to Shop Drawings and other submittals, in electronic media or digital format, either directly, or through access to a secure Project website.
- B. If the Contract does not establish protocols for electronic or digital transmittals, then Owner, Engineer, and Contractor shall jointly develop such protocols.
- C. When transmitting items in electronic media or digital format, the transmitting party makes no representations as to long term compatibility, usability, or readability of the items 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 items, or from those established in applicable transmittal protocols.

ARTICLE 3 – DOCUMENTS: INTENT, REQUIREMENTS, REUSE

3.01 *Intent*

- A. The Contract Documents are complementary; what is required by one is as binding as if required by all.
- B. It is the intent of the Contract Documents to describe a functionally complete project (or part thereof) to be constructed in accordance with the Contract Documents.
- C. Unless otherwise stated in the Contract Documents, if there is a discrepancy between the electronic or digital versions of the Contract Documents (including any printed copies derived from such electronic or digital versions) and the printed record version, the printed record version shall 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.

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, shall mean 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, or any instruction of a Supplier, shall be effective to change the duties or responsibilities of Owner, Contractor, or Engineer, or any of their subcontractors, consultants, agents, or employees, from

those set forth in the part of the Contract Documents prepared by or for Engineer. No such provision or instruction shall be effective to assign to Owner, Engineer, or any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors, any duty or authority to supervise or direct the performance of the Work or any duty or authority to undertake responsibility inconsistent with the provisions of the part of the Contract Documents prepared by or for Engineer.

- a. The work shall be performed in accordance with the Minnesota Department of Transportation “Standard Specification for Highway Construction”, current edition, and any supplements or amendments thereto issued prior to the date of these Contract Documents, except as modified or supplemented in these General Conditions, Supplementary General Conditions, the current City of Plymouth Engineering Guidelines, Specifications, or other Contract Documents.

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 Documents 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 Documents 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 shall 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 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 thereunder.
- 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 give written notice to Owner and Contractor 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 editions, 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 shall preclude 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 thirtieth 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 sixtieth day after the day of Bid opening or the thirtieth 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 shall 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. **CONTRACTOR shall notify the Resident Project Representative a minimum of 48 hours in advance of the need for construction stakes on the project.**

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 shall 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 shall 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 the Contract Times and Contract Price. Contractor's entitlement to an adjustment of the Contract Times is conditioned on such adjustment being essential to Contractor's ability to complete the Work within the Contract Times.
- 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. Contractor's entitlement to an adjustment of the Contract Times is conditioned on such adjustment being essential to Contractor's ability to complete the Work within the Contract Times. Such an adjustment shall 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 utility owners (other than those performing other work at or adjacent to the Site by arrangement with the Owner, as contemplated in Article 8); and
 4. acts of war or terrorism.
- D. 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.
 - E. Paragraph 8.03 governs 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.
 - F. Contractor shall not be entitled to an adjustment in Contract Price or Contract Times 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.
 - G. Contractor must submit any Change Proposal seeking an adjustment in Contract Price or Contract Times under this paragraph within 30 days of the commencement of the delaying, disrupting, or interfering event.

ARTICLE 5 – AVAILABILITY OF LANDS; SUBSURFACE AND PHYSICAL CONDITIONS; HAZARDOUS ENVIRONMENTAL CONDITIONS

5.01 *Availability of Lands*

- A. Owner shall furnish the Site. Owner shall notify Contractor of any encumbrances or restrictions not of general application but specifically related to use of the Site with which Contractor must comply in performing the Work.
- 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; 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 7.12, 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 at law; 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 shall conform to applicable Laws and Regulations.
- C. *Cleaning:* Prior to Substantial Completion of the Work Contractor shall clean the Site and the Work and make it ready for utilization by Owner. At the completion of the Work Contractor shall remove from the Site 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 known to Owner of explorations and tests of subsurface conditions at or adjacent to the Site;
 - 2. those drawings known to Owner of physical conditions relating to existing surface or subsurface structures at the Site (except Underground Facilities); 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 upon the accuracy of the Technical Data (as defined in Article 1) contained in any geotechnical or environmental report prepared for the Project and made available to Contractor. Except for such reliance on Technical Data, Contractor may not rely upon or make any claim against Owner or Engineer, or any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors, with respect to:
 - 1. the completeness of such reports and drawings for Contractor's purposes, including, but not limited to, any aspects of the means, methods, techniques, sequences, and procedures of construction to be employed by Contractor, and safety precautions and programs incident thereto; or
 - 2. other data, interpretations, opinions, and information contained in such reports or shown or indicated in such drawings; or

3. 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 either:
1. is of such a nature as to establish that any Technical Data on which Contractor is entitled to rely as provided in Paragraph 5.03 is materially inaccurate; or
 2. is of such a nature as to require a change in the Drawings or Specifications; or
 3. differs materially from that shown or indicated in the Contract Documents; or
 4. is of an unusual nature, and differs materially from conditions ordinarily encountered and generally recognized as inherent in work of the character provided for in the Contract Documents;

then Contractor shall, promptly after becoming aware thereof and before further disturbing the subsurface or physical conditions or performing any Work in connection therewith (except in an emergency as required by Paragraph 7.15), notify Owner and Engineer in writing about such condition. Contractor shall not further disturb such condition or perform any Work in connection therewith (except with respect to an emergency) until receipt of a written statement permitting Contractor to do so.

- B. *Engineer's Review:* After receipt of written notice as required by the preceding paragraph, Engineer will promptly review the subsurface or physical condition in question; determine the necessity of Owner's obtaining additional exploration or tests with respect to the condition; conclude whether the condition falls within any one or more of the differing site condition categories in Paragraph 5.04.A above; 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. *Possible Price and Times Adjustments:*
1. Contractor shall be entitled to an equitable adjustment in Contract Price or Contract Times, or both, 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 conditioned on such adjustment being essential to Contractor's ability to complete the Work within the Contract Times.

2. Contractor shall not be entitled to any adjustment in the Contract Price or Contract Times with respect to a subsurface or physical condition if:
 - a. Contractor knew of the existence of such condition at the time Contractor made a commitment to Owner with respect to Contract Price and Contract Times by the submission of a Bid or becoming bound under a negotiated contract, or otherwise; or
 - b. the existence of such condition reasonably could have been discovered or revealed as a result of any examination, investigation, exploration, test, or study of the Site and contiguous areas expressly required by the Bidding Requirements or Contract Documents to be conducted by or for Contractor prior to Contractor's making such commitment; or
 - c. Contractor failed to give the written notice as required by Paragraph 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, or both, then any such adjustment shall 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, or both, 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.

5.05 *Underground Facilities*

- A. *Contractor's Responsibilities:* The information and data shown or indicated in the Contract Documents with respect to existing Underground Facilities at or adjacent to the Site is based on information and data furnished to Owner or Engineer by the owners of such Underground Facilities, including Owner, or by others. Unless it is otherwise expressly provided in the Supplementary Conditions:
 1. Owner and Engineer do not warrant or guarantee the accuracy or completeness of any such information or data provided by others; and
 2. the cost of all of the following will be included in the Contract Price, and Contractor shall have full responsibility for:
 - a. reviewing and checking all information and data regarding existing Underground Facilities at the Site;
 - b. locating all Underground Facilities shown or indicated in the Contract Documents as being at the Site;
 - c. coordination of the Work with the owners (including Owner) of such Underground Facilities, during construction; and
 - d. 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 in the Contract Documents, or was not shown or indicated 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), identify the owner of such Underground Facility and give written notice to that owner and to Owner and Engineer.
- C. *Engineer's Review:* Engineer will promptly review the Underground Facility and conclude whether such Underground Facility was not shown or indicated in the Contract Documents, or was not shown or indicated with reasonable accuracy; obtain any pertinent cost or schedule information from

Contractor; prepare recommendations to Owner regarding the Contractor's resumption of Work in connection with the Underground Facility in question; 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 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. *Possible Price and Times Adjustments:*
1. Contractor shall be entitled to an equitable adjustment in the Contract Price or Contract Times, or both, to the extent that any existing Underground Facility at the Site that was not shown or indicated in the Contract Documents, 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. Contractor did not know of and could not reasonably have been expected to be aware of or to have anticipated the existence or actual location of the Underground Facility in question;
 - 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;
 - c. Contractor's entitlement to an adjustment of the Contract Times is conditioned on such adjustment being essential to Contractor's ability to complete the Work within the Contract Times; and
 - d. 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, or both, then any such adjustment shall 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, or both, no later than 30 days after Owner's issuance of the Owner's written statement to Contractor regarding the Underground Facility in question.

5.06 *Hazardous Environmental Conditions at Site*

- A. *Reports and Drawings:* The Supplementary Conditions identify:
1. those reports and drawings known to Owner relating to Hazardous Environmental Conditions that have been identified at or adjacent to the Site; and
 2. 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 Article 1) contained in any geotechnical or environmental report prepared for the Project and made available

to Contractor. Except for such reliance on Technical Data, Contractor may not rely upon or make any claim against Owner or Engineer, or any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors with respect to:

1. the completeness of such reports and drawings for Contractor's purposes, including, but not limited to, any aspects of the means, methods, techniques, sequences and procedures of construction to be employed by Contractor and safety precautions and programs incident thereto; or
 2. other data, interpretations, opinions and information contained in such reports or shown or indicated in such drawings; or
 3. 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, or both, as a result of such Work stoppage or such special conditions under which Work is agreed to be resumed by Contractor, 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.
- 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 or 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.H shall obligate 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 shall obligate 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 all of Contractor's obligations under the Contract. These bonds shall remain in effect until one year after the date when final payment becomes due or until completion of the correction period specified in Paragraph 15.08, whichever is later, except as provided otherwise by Laws or Regulations, the Supplementary Conditions, or other specific provisions of the Contract. Contractor shall also furnish such other bonds as are required by the Supplementary Conditions or other specific provisions of the Contract.
- B. All bonds shall be in the form prescribed by the Contract except as provided otherwise by Laws or Regulations, and shall be executed by such sureties as are named in "Companies Holding Certificates of Authority as Acceptable Sureties on Federal Bonds and as Acceptable Reinsuring Companies" as published in Circular 570 (as amended and supplemented) by the Financial Management Service, Surety Bond Branch, 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 shall show that it is effective on the date the agent or attorney-in-fact signed the accompanying bond.
- C. Contractor shall obtain the required bonds from surety companies that are duly licensed or authorized in the jurisdiction in which the Project is located to issue bonds in the required amounts.

- D. If the surety on a bond furnished by Contractor is declared bankrupt or becomes insolvent, or its right to do business is terminated in any state or jurisdiction where any part of the Project is located, or the surety ceases to meet the requirements above, then Contractor shall promptly notify Owner and Engineer and shall, within 20 days after the event giving rise to such notification, provide another bond and surety, both of which shall comply with the bond and surety requirements above.
- E. 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.
- F. Upon request, Owner shall provide a copy of the payment bond to any Subcontractor, Supplier, or other person or entity claiming to have furnished labor or materials used in the performance of the Work.

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. Contractor shall deliver to Owner, with copies to each named insured and additional insured (as identified in this Article, in the Supplementary Conditions, or elsewhere in the Contract), certificates of insurance establishing that Contractor has obtained and is maintaining the policies, coverages, and endorsements 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 and endorsements, and documentation of applicable self-insured retentions and deductibles. Contractor may block out (redact) any confidential premium or pricing information contained in any policy or endorsement furnished under this provision.
- D. Owner shall deliver to Contractor, with copies to each named insured and additional insured (as identified in this Article, the Supplementary Conditions, or elsewhere in the Contract), certificates of insurance establishing that Owner has obtained and is maintaining the policies, coverages, and endorsements 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 and endorsements, and documentation of applicable self-insured retentions and deductibles. Owner may block out (redact) any confidential premium or pricing information contained in any policy or endorsement furnished under this provision.
- E. 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, shall not be construed as a waiver of the other party's obligation to obtain and maintain such insurance.
- F. If either party does not purchase or maintain all of 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.
- G. If Contractor has failed to obtain and maintain required insurance, Owner may exclude the Contractor from the Site, impose an appropriate set-off against payment, and exercise Owner's termination rights under Article 16.

- H. Without prejudice to any other right or remedy, if a party has failed to obtain required insurance, the other party may elect 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 shall be adjusted accordingly.
- I. Owner does not represent that insurance coverage and limits established in this Contract necessarily will be adequate to protect Contractor or Contractor's interests.
- J. The insurance and insurance limits required herein shall not be deemed as a limitation on Contractor's liability under the indemnities granted to Owner and other individuals and entities in the Contract.

6.03 *Contractor's Insurance*

- A. *Workers' Compensation:* Contractor shall purchase and maintain workers' compensation and employer's liability insurance for:
 - 1. claims under workers' compensation, disability benefits, and other similar employee benefit acts. **The limits of liability for the insurance shall provide coverage for not less than the following amounts or greater where required by Laws and Regulations:**
 - a. State: Statutory
 - b. Applicable Federal (e.g. Longshoreman's): Statutory
 - c. Employer's Liability: \$2,000,000
 - 2. United States Longshoreman and Harbor Workers' Compensation Act and Jones Act coverage (if applicable).
 - 3. Claims for damages because of bodily injury, occupational sickness or disease, or death of Contractor's employees (by stop-gap endorsement in monopolist worker's compensation states). **The limits of liability for the insurance shall provide coverage for not less than the following amounts or greater where required by Laws and Regulations:**
 - a. State: Statutory
 - b. Applicable Federal (e.g. Longshoreman's): Statutory
 - c. Employer's Liability: \$2,000,000
 - 4. Foreign voluntary worker compensation (if applicable).
- B. *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:
 - 1. Claims for damages because of bodily injury, sickness or disease, or death of any person other than Contractor's employees. **The limits of liability for the insurance shall provide coverage for not less than the following amounts or greater where required by Laws and Regulations:**
 - a. (1) General Aggregate (Except Products – Completed Operations) \$2,000,000
 - b. (2) Products – Completed (Operations Aggregate) \$2,000,000
 - c. (3) Personal and Advertising Injury (Per Personal/Organization) \$2,000,000

- d. (4) Each Occurrence (Bodily Injury and Property Damage)
\$2,000,000
 - e. (5) Property Damage Liability Insurance will provide Explosion, Collapse and Underground coverage's where applicable \$2,000,000
 - f. (6) Excess Liability
 - g. General Aggregate \$2,000,000
 - h. Each Occurrence \$2,000,000
2. Claims for damages insured by reasonably available personal injury liability coverage. The limits of liability for the insurance shall provide coverage for not less than the following amounts or greater where required by Laws and Regulations:
- a. (1) General Aggregate (Except Products – Completed Operations)
\$2,000,000
 - b. (2) Products – Completed (Operations Aggregate) \$2,000,000
 - c. (3) Personal and Advertising Injury (Per Personal/Organization) \$2,000,000
 - d. (4) Each Occurrence (Bodily Injury and Property Damage)
\$2,000,000
 - e. (5) Property Damage Liability Insurance will provide Explosion, Collapse and Underground coverage's where applicable \$2,000,000
 - f. (6) Excess Liability
 - g. General Aggregate \$2,000,000
 - h. Each Occurrence \$2,000,000
3. Claims for damages, other than to the Work itself, because of injury to or destruction of tangible property wherever located, including loss of use resulting therefrom. The limits of liability for the insurance shall provide coverage for not less than the following amounts or greater where required by Laws and Regulations:
- a. (1) General Aggregate (Except Products – Completed Operations)
\$2,000,000
 - b. (2) Products – Completed (Operations Aggregate) \$2,000,000
 - c. (3) Personal and Advertising Injury (Per Personal/Organization) \$2,000,000
 - d. (4) Each Occurrence (Bodily Injury and Property Damage)
\$2,000,000
 - e. (5) Property Damage Liability Insurance will provide Explosion, Collapse and Underground coverage's where applicable \$2,000,000
 - f. (6) Excess Liability
 - g. General Aggregate \$2,000,000
 - h. Each Occurrence \$2,000,000
- C. *Commercial General Liability—Form and Content:* Contractor's commercial liability policy shall be written on a 1996 (or later) ISO commercial general liability form (occurrence form) and include the following coverages and endorsements:

1. Products and completed operations coverage:
 - a. Such insurance shall 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, to the extent permitted by law, including but not limited to coverage of Contractor's contractual indemnity obligations in Paragraph 7.18.
 3. Broad form property damage coverage.
 4. Severability of interest.
 5. Underground, explosion, and collapse coverage.
 6. Personal injury coverage.
 7. 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); or CG 20 10 07 04 and CG 20 37 07 04 (together); or their equivalent.
 8. 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.
- D. *Automobile liability:* Contractor shall purchase and maintain automobile liability insurance against claims for damages because of bodily injury or death of any person or property damage arising out of the ownership, maintenance, or use of any motor vehicle. The automobile liability policy shall be written on an occurrence basis. **The limits of liability for the insurance shall provide coverage for not less than the following amounts or greater where required by Laws and Regulations:**
1. **(1) Bodily Injury:**
 2. **Each Person \$2,000,000**
 3. **Each Accident \$2,000,000**
 4. **(2) Property Damage:**
 5. **Each Accident \$2,000,000**
- OR**
6. **(3) Combined Single Limit**
 7. **Each Accident \$2,000,000**
- E. *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. Subject to industry-standard exclusions, the coverage afforded shall follow form as to each and every one of the underlying policies.
- F. *Contractor's pollution liability insurance:* Contractor shall purchase and maintain a policy covering third-party injury and property damage claims, including clean-up costs, as a result of pollution conditions arising from Contractor's operations and completed operations. This insurance shall be maintained for no less than three years after final completion.
- G. *Additional insureds:* The Contractor's commercial general liability, automobile liability, umbrella or excess, and pollution liability policies shall include and list as additional insureds Owner and Engineer,

6.04 *Owner's Liability Insurance*

- A. In addition to the insurance required to be provided by Contractor under Paragraph 6.03, Owner, at Owner's option, may purchase and maintain at Owner's expense Owner's own liability insurance as will protect Owner against claims which may arise from operations under the Contract Documents.
- B. 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.

6.05 *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 full insurable replacement cost thereof (subject to such deductible amounts as may be provided in the Supplementary Conditions or required by Laws and Regulations). This insurance shall:
 - 1. include the Owner and Contractor as named insureds, and all Subcontractors, and any individuals or entities required by the Supplementary Conditions to be insured under such builder's risk policy, as insureds or named insureds. For purposes of the remainder of this Paragraph 6.05, Paragraphs 6.06 and 6.07, and any corresponding Supplementary Conditions, the parties required to be insured shall collectively be referred to as "insureds."
 - 2. be written on a builder's risk "all risk" policy form that shall at least include insurance for physical loss or damage to the Work, temporary buildings, falsework, and materials and equipment in transit, and shall insure against at least the following perils or causes of loss: fire; lightning; windstorm; riot; civil commotion; terrorism; vehicle impact; aircraft; smoke; theft; vandalism and malicious mischief; mechanical breakdown, boiler explosion, and artificially generated electric current; earthquake; volcanic activity, and other earth movement; flood; collapse; explosion; debris removal; demolition occasioned by enforcement of Laws and Regulations; water damage (other than that caused by flood); and such other perils or causes of loss as may be specifically required by the Supplementary Conditions. If insurance against mechanical breakdown, boiler explosion, and artificially generated electric current; earthquake; volcanic activity, and other earth movement; or flood, are not commercially available under builder's risk policies, by endorsement or otherwise, such insurance may be provided through other insurance policies acceptable to Owner and Contractor.
 - 3. cover, as insured property, at least the following: (a) the Work and all materials, supplies, machinery, apparatus, equipment, fixtures, and other property of a similar nature that are to be incorporated into or used in the preparation, fabrication, construction, erection, or completion of the Work, including Owner-furnished or assigned property; (b) spare parts inventory required within the scope of the Contract; and (c) temporary works which are not intended to form part of the permanent constructed Work but which are intended to provide working access to the Site, or to the Work under construction, or which are intended to provide temporary support for the Work under construction, including scaffolding, form work, fences, shoring, falsework, and temporary structures.
 - 4. cover expenses incurred in the repair or replacement of any insured property (including but not limited to fees and charges of engineers and architects).
 - 5. extend to cover damage or loss to insured property while in temporary storage at the Site or in a storage location outside the Site (but not including property stored at the premises of a manufacturer or Supplier).
 - 6. extend to cover damage or loss to insured property while in transit.

7. allow for partial occupation or use of the Work by Owner, such that those portions of the Work that are not yet occupied or used by Owner shall remain covered by the builder's risk insurance.
 8. allow for the waiver of the insurer's subrogation rights, as set forth below.
 9. provide primary coverage for all losses and damages caused by the perils or causes of loss covered.
 10. not include a co-insurance clause.
 11. include an exception for ensuing losses from physical damage or loss with respect to any defective workmanship, design, or materials exclusions.
 12. include performance/hot testing and start-up.
 13. be maintained in effect, subject to the provisions herein regarding Substantial Completion and partial occupancy or use of the Work by Owner, until the Work is complete.
- B. *Notice of Cancellation or Change:* All the policies of insurance (and the certificates or other evidence thereof) required to be purchased and maintained in accordance with this Paragraph 6.05 will contain a provision or endorsement that the coverage afforded will not be canceled or materially changed 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.
- C. *Deductibles:* The purchaser of any required builder's risk or property insurance shall pay for costs not covered because of the application of a policy deductible.
- 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 notice of such occupancy or use to the builder's risk insurer. The builder's risk insurance shall not be canceled or permitted to lapse on account of any such partial use or occupancy; rather, those portions of the Work that are occupied or used by Owner may come off the builder's risk policy, while those portions of the Work not yet occupied or used by Owner shall remain covered by the builder's risk insurance.
- E. *Additional Insurance:* 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 6.05, it may do so at Contractor's expense.
- F. *Insurance of Other Property:* If the express insurance provisions of the Contract do not require or address the insurance of a property item or interest, such as tools, construction equipment, or other personal property owned by Contractor, a Subcontractor, or an employee of Contractor or a Subcontractor, then the entity or individual owning such property item will be responsible for deciding whether to insure it, and if so in what amount.

6.06 Waiver of Rights

- A. All policies purchased in accordance with Paragraph 6.05, expressly including the builder's risk policy, shall contain provisions to the effect that in the event of payment of any loss or damage the insurers will have no rights of recovery against any insureds thereunder, or against Engineer or its consultants, or their officers, directors, members, partners, employees, agents, consultants, or subcontractors. 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 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 Subcontractors, all individuals or entities

identified in the Supplementary Conditions as 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. None of the above waivers shall extend to the rights that any party making such waiver may have to the proceeds of insurance held by Owner or Contractor as trustee or fiduciary, or otherwise payable under any policy so issued.

- B. Owner waives all rights against Contractor, Subcontractors, and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them, for:
 - 1. loss due to business interruption, loss of use, or other consequential loss extending beyond direct physical loss or damage to Owner's property or the Work caused by, arising out of, or resulting from fire or other perils whether or not insured by Owner; and
 - 2. loss or damage to the completed Project or part thereof caused by, arising out of, or resulting from fire or other insured peril or cause of loss covered by any property insurance maintained on the completed Project or part thereof by Owner during partial 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.
- C. Any insurance policy maintained by Owner covering any loss, damage or consequential loss referred to in Paragraph 6.06.B shall contain provisions to the effect that in the event of payment of any such loss, damage, or consequential loss, the insurers will have no rights of recovery against Contractor, Subcontractors, or Engineer, or the officers, directors, members, partners, employees, agents, consultants, or subcontractors of each and any of them.
- D. Contractor shall be responsible for assuring that the agreement under which a Subcontractor performs a portion of the Work 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 any of the perils or causes of loss covered by builder's risk insurance and any other property insurance applicable to the Work.

6.07 *Receipt and Application of Property Insurance Proceeds*

- A. Any insured loss under the builder's risk and other policies of insurance required by Paragraph 6.05 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 6.05 shall 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, the damaged Work shall be repaired or replaced, the money so received applied on account thereof, and the Work and the cost thereof covered by Change Order, if needed.

ARTICLE 7 – CONTRACTOR’S RESPONSIBILITIES

7.01 *Supervision and Superintendence*

- A. Contractor shall supervise, inspect, and direct the Work competently and efficiently, devoting such attention thereto and applying such skills and expertise as may be necessary to perform the Work in accordance with the Contract Documents. Contractor shall be solely responsible for the means, methods, techniques, sequences, and procedures of construction.
 - 1. The CONTRACTOR shall provide a superintendent in charge of the overall project. He shall be a competent individual who is fully authorized and capable of managing, directing and coordinating the project; who is fully experienced in the type of work being performed; who is capable of reading and thoroughly understanding the plans and specifications and who is authorized to receive instructions from the ENGINEER and his representatives. He must be on the Project a minimum of eight (8) hours each day from beginning until completion and shall not have responsibility for any other project. He must have worked as a superintendent on previous projects.
- B. The CONTRACTOR shall assume the responsibility for supervision of the project regardless of the amount of the work sublet and shall give the project the necessary attention to facilitate satisfactory progress and assure completion in accordance with the terms of the Contract.
- C. The Superintendent shall maintain complete records of the work as it progresses and submit the records with each request for payment.
- D. The Superintendent shall have authority to act on behalf of the CONTRACTOR. All communications given to the Superintendent shall be as binding as if given to the CONTRACTOR.
- E. The Superintendent shall not be a working foreman, but rather a full-time supervisory position to manage the construction of this project.
- F. At all times during the progress of the Work, Contractor shall assign a competent resident superintendent who shall not be replaced without written notice to Owner and Engineer except under extraordinary circumstances.

7.02 *Labor; Working Hours*

- A. Contractor shall provide competent, suitably qualified personnel to survey and lay out the Work and perform construction as required by the Contract Documents. Contractor shall at all times maintain good discipline and order at the Site.
- B. Except as otherwise required for the safety or protection of persons or the Work or property at the Site or adjacent thereto, and except as otherwise stated in the Contract Documents, all Work at the Site shall be performed during regular working hours, 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.

7.03 *Services, Materials, and Equipment*

- A. Unless otherwise specified in the Contract Documents, Contractor shall provide and assume full responsibility for all services, materials, equipment, labor, transportation, construction equipment and machinery, tools, appliances, fuel, power, light, heat, telephone, water, sanitary facilities, temporary facilities, and all other facilities and incidentals necessary for the performance, testing, start up, and completion of the Work, whether or not such items are specifically called for in the Contract Documents.

- B. All materials and equipment incorporated into the Work shall be of good quality and new, except as otherwise provided in the Contract Documents. All special warranties and guarantees required by the Specifications shall expressly run to the benefit of Owner. If required by Engineer, Contractor shall furnish satisfactory evidence (including reports of required tests) as to the source, kind, and quality of materials and equipment.
- C. All materials and equipment shall be stored, applied, installed, connected, erected, protected, used, cleaned, and conditioned in accordance with instructions of the applicable Supplier, except as otherwise may be provided in the Contract Documents.

7.04 *“Or Equals”*

- A. Whenever an item of material or equipment is specified or described in the Contract Documents by using the name of a proprietary item or the name of a particular Supplier, the 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 material or equipment, or items from other proposed suppliers under the circumstances described below.
 - 1. If Engineer in its sole discretion determines that an item of material or equipment proposed by Contractor is functionally equal to that named and sufficiently similar so that no change in related Work will be required, Engineer shall deem it an “or equal” item. For the purposes of this paragraph, a proposed item of material or equipment will be considered functionally equal to an item so named if:
 - a. in the exercise of reasonable judgment Engineer determines that:
 - 1) it is at least equal in materials of construction, quality, durability, appearance, strength, and design characteristics;
 - 2) it will reliably perform at least equally well the function and achieve the results imposed by the design concept of the completed Project as a functioning whole;
 - 3) it has a proven record of performance and availability of responsive service; and
 - 4) it is not objectionable to Owner.
 - b. Contractor certifies that, if approved and incorporated into the Work:
 - 1) there will be no increase in cost to the Owner or increase in Contract Times; and
 - 2) it will conform substantially to the detailed requirements of the item named in the Contract Documents.
- 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 shall result in any change in Contract Price. The Engineer's denial of an "or-equal" request shall be final and binding, and may not be reversed through an appeal under any provision of the Contract Documents.
- E. *Treatment as a Substitution Request:* If Engineer determines that an item of material or equipment proposed by Contractor does not qualify as an "or-equal" item, Contractor may request that Engineer considered the proposed item as a substitute pursuant to Paragraph 7.05.

7.05 *Substitutes*

- A. Unless the specification or description of an item of material or equipment 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 material or equipment under the circumstances described below. To the extent possible such requests shall 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 material or equipment from anyone other than Contractor.
 - 2. The requirements for review by Engineer will be as set forth in Paragraph 7.05.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 material or equipment that Contractor seeks to furnish or use. The application:
 - a. shall 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 that specified, and
 - 3) be suited to the same use as that 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 that specified, and
 - 2) available engineering, sales, maintenance, repair, and replacement services.
 - d. shall 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 shall be final and binding, and may not be reversed through an appeal under any provision of the Contract Documents. Contractor may challenge the scope of reimbursement costs imposed under Paragraph 7.05.D, by timely submittal of a Change Proposal.

7.06 *Concerning Subcontractors, Suppliers, and Others*

- A. Contractor may retain Subcontractors and Suppliers for the performance of parts of the Work. Such Subcontractors and Suppliers must be acceptable to Owner.
- B. Contractor shall retain specific Subcontractors, Suppliers, or other individuals or entities 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, Supplier, or other individual or entity 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 five days.
- E. Owner may require the replacement of any Subcontractor, Supplier, or other individual or entity retained by Contractor to perform any part of the Work. 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, Suppliers, or other individuals or entities 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, Supplier, or other individual or entity so identified solely on the basis of substantive, reasonable objection after due investigation. Contractor shall submit an acceptable replacement for the rejected Subcontractor, Supplier, or other individual or entity.

- F. If Owner requires the replacement of any Subcontractor, Supplier, or other individual or entity retained by Contractor to perform any part of the Work, then Contractor shall be entitled to an adjustment in Contract Price or Contract Times, or both, 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, Supplier, or other individual or entity, whether initially or as a replacement, shall 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 fully responsible to Owner and Engineer for all acts and omissions of the Subcontractors, Suppliers, and other individuals or entities performing or furnishing any of the Work just as Contractor is responsible for Contractor's own acts and omissions.
- J. Contractor shall be solely responsible for scheduling and coordinating the work of Subcontractors, Suppliers, and all other individuals or entities performing or furnishing any of the Work.
- K. Contractor shall restrict all Subcontractors, Suppliers, and such other individuals or entities performing or furnishing any of the Work from communicating with Engineer or Owner, except through Contractor or in case of an emergency, or as otherwise expressly allowed herein.
- L. The divisions and sections of the Specifications and the identifications of any Drawings shall not control Contractor in dividing the Work among Subcontractors or Suppliers or delineating the Work to be performed by any specific trade.
- M. All Work performed for Contractor by a Subcontractor or Supplier shall be pursuant to an appropriate contractual agreement that specifically binds the Subcontractor or Supplier to the applicable terms and conditions of the Contract Documents for the benefit of Owner and Engineer.
- N. Owner may furnish to any Subcontractor or Supplier, to the extent practicable, information about amounts paid to Contractor on account of Work performed for Contractor by the particular Subcontractor or Supplier.
- O. Nothing in the Contract Documents:
 - 1. shall create for the benefit of any such Subcontractor, Supplier, or other individual or entity any contractual relationship between Owner or Engineer and any such Subcontractor, Supplier, or other individual or entity; nor
 - 2. shall create any obligation on the part of Owner or Engineer to pay or to see to the payment of any money due any such Subcontractor, Supplier, or other individual or entity except as may otherwise be required by Laws and Regulations.
- P. **The CONTRACTOR shall perform work amounting to not less than 50% of the total contract cost. A CONTRACTOR that cannot demonstrate meeting this criteria will be deemed unqualified to perform the work.**

7.07 *Patent Fees and Royalties*

- A. Contractor shall pay all license fees and royalties and assume all costs incident to the use in the performance of the Work or the incorporation in the Work of any invention, design, process, product, or device which is the subject of patent rights or copyrights held by others. If a particular invention, design, process, product, or device is specified in the Contract Documents for use in the performance of the Work and if, to the actual knowledge of Owner or Engineer, its use is subject to patent rights or

copyrights calling for the payment of any license fee or royalty to others, the existence of such rights shall be disclosed by Owner in the Contract Documents.

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

7.08 *Permits*

- A. Unless otherwise provided in the Contract Documents, Contractor shall obtain and pay for all construction permits and licenses. Owner shall assist Contractor, when necessary, in obtaining such permits and licenses. Contractor shall pay all governmental charges and inspection fees necessary for the prosecution of the Work which are applicable at the time of 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

7.09 *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.

7.10 *Laws and Regulations*

- A. Contractor shall give all notices required by and shall comply with all Laws and Regulations applicable to the performance of the Work. Except where otherwise expressly required by applicable Laws and Regulations, neither Owner nor Engineer shall be responsible for monitoring Contractor's compliance with any Laws or Regulations.
- B. If Contractor performs any Work 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 shall not be Contractor's responsibility to make certain that the Work described in the Contract Documents is in accordance with Laws and Regulations, but this shall not relieve Contractor of Contractor's obligations under Paragraph 3.03.
- C. Owner or Contractor may give 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 notice Contractor may submit a Change Proposal, or Owner may initiate a Claim.

- D. **CONTRACTOR shall specifically comply with Equal Opportunity Requirements as listed in Minnesota Rules 5000.3535 Standard State Equal Employment Opportunity Construction Contract Specifications.**
- E. **CONTRACTOR shall specifically comply with Minnesota Rules 5000.3550, Disabled Individuals Affirmative Action Clause.**

7.11 *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.

7.12 *Safety and Protection*

- A. Contractor shall be solely responsible for initiating, maintaining, and supervising all safety precautions and programs in connection with the Work. Such responsibility does not relieve Subcontractors of their responsibility for the safety of persons or property in the performance of their work, nor for compliance with applicable safety Laws and Regulations. Contractor shall take all necessary precautions for the safety of, and shall provide the necessary protection to prevent damage, injury, or loss to:
 - 1. all persons on the Site or who may be affected by the Work;
 - 2. all the Work and materials and equipment to be incorporated therein, whether in storage on or off the Site; and
 - 3. other property at the Site or adjacent thereto, including trees, shrubs, lawns, walks, pavements, roadways, structures, other work in progress, utilities, and Underground Facilities not designated for removal, relocation, or replacement in the course of construction.
- B. Contractor shall comply with all applicable Laws and Regulations relating to the safety of persons or property, or to the protection of persons or property from damage, injury, or loss; and shall erect and maintain all necessary safeguards for such safety and protection. Contractor shall notify Owner; the owners of adjacent property, Underground Facilities, and other utilities; and other contractors and utility owners performing work at or adjacent to the Site, when 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.
- C. Contractor shall comply with the applicable requirements of Owner's safety programs, if any. The Supplementary Conditions identify any Owner's safety programs that are applicable to the Work.
- D. Contractor shall inform Owner and Engineer of the specific requirements of Contractor's safety program with which Owner's and Engineer's employees and representatives must comply while at the Site.
- E. All damage, injury, or loss to any property referred to in Paragraph 7.12.A.2 or 7.12.A.3 caused, directly or indirectly, in whole or in part, by Contractor, any Subcontractor, Supplier, or any other individual

or entity directly or indirectly employed by any of them to perform any of the Work, or anyone for whose acts any of them may be liable, shall be remedied by Contractor 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).

- F. Contractor's duties and responsibilities for safety and protection shall continue until such time as all the Work is completed and Engineer has issued a notice to Owner and Contractor in accordance with Paragraph 15.06.B that the Work is acceptable (except as otherwise expressly provided in connection with Substantial Completion).
- G. Contractor's duties and responsibilities for safety and protection shall 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.

7.13 *Safety Representative*

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

7.14 *Hazard Communication Programs*

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

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 threatened damage, injury, or loss. Contractor shall give Engineer prompt written notice if Contractor believes that any significant changes in the Work or variations from the Contract Documents have been caused thereby or are required as a result thereof. If Engineer determines that a change in the Contract Documents is required because of the action taken by Contractor in response to such an emergency, a Work Change Directive or Change Order will be issued.

7.16 *Shop Drawings, Samples, and Other Submittals*

A. *Shop Drawing and Sample Submittal Requirements:*

1. Before submitting a Shop Drawing or Sample, Contractor shall have:
 - a. reviewed and coordinated the Shop Drawing or Sample with other Shop Drawings and Samples and with the requirements of the Work and the Contract Documents;
 - b. determined and verified all field measurements, quantities, dimensions, specified performance and design criteria, installation requirements, materials, catalog numbers, and similar information with respect thereto;
 - c. determined and verified the suitability of all materials and equipment offered with respect to the indicated application, fabrication, shipping, handling, storage, assembly, and installation pertaining to the performance of the Work; and

- d. determined and verified all information relative to Contractor's responsibilities for means, methods, techniques, sequences, and procedures of construction, and safety precautions and programs incident thereto.
 2. Each submittal shall bear a stamp or specific written certification that Contractor has satisfied Contractor's obligations under the Contract Documents with respect to Contractor's review of that submittal, and that Contractor approves the submittal.
 3. With each submittal, Contractor shall give Engineer specific written notice of any variations that the Shop Drawing or Sample may have from the requirements of the Contract Documents. This notice shall be set forth in a written communication separate from the Shop Drawings or Sample submittal; and, in addition, in the case of Shop Drawings by a specific notation made on each Shop Drawing submitted to Engineer for review and approval of each such variation.
- B. *Submittal Procedures for Shop Drawings and Samples:* Contractor shall submit Shop Drawings and Samples to Engineer for review and approval in accordance with the accepted Schedule of Submittals. Each submittal will be identified as Engineer may require.
1. *Shop Drawings:*
 - a. Contractor shall submit the number of copies required in the Specifications.
 - b. Data shown on the Shop Drawings will be complete with respect to quantities, dimensions, specified performance and design criteria, materials, and similar data to show Engineer the services, materials, and equipment Contractor proposes to provide and to enable Engineer to review the information for the limited purposes required by Paragraph 7.16.D.
 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.D.
 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. *Other Submittals:* Contractor shall submit other submittals to Engineer in accordance with the accepted Schedule of Submittals, and pursuant to the applicable terms of the Specifications.
- D. *Engineer's Review:*
1. Engineer will provide timely review of Shop Drawings and Samples in accordance with the Schedule of Submittals acceptable to Engineer. Engineer's review and approval will be only to determine if the items covered by the submittals will, after installation or incorporation in the Work, conform to the information given in the Contract Documents and be compatible with the design concept of the completed Project as a functioning whole as indicated by the Contract Documents.
 2. Engineer's review and approval will not extend to means, methods, techniques, sequences, or procedures of construction 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 shall not relieve Contractor from responsibility for any variation from the requirements of the Contract Documents unless Contractor has complied with the requirements of Paragraph 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.
 5. Engineer's review and approval of a Shop Drawing or Sample shall not relieve Contractor from responsibility for complying with the requirements of Paragraph 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, shall 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, Sample, or other submittal shall 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.D.4.
- E. *Resubmittal Procedures:*
1. Contractor shall make corrections required by Engineer and shall return the required number of corrected copies of Shop Drawings and submit, as required, new Samples for review and approval. Contractor shall direct specific attention in writing to revisions other than the corrections called for by Engineer on previous submittals.
 2. Contractor shall furnish required submittals with sufficient information and accuracy to obtain required approval of an item with no more than three submittals. Engineer will record Engineer's time for reviewing a fourth or subsequent submittal of a Shop Drawings, sample, or other item requiring approval, and Contractor shall be responsible for Engineer's charges to Owner for such time. Owner may impose a set-off against payments due to Contractor to secure reimbursement for such charges.
 3. If Contractor requests a change of a previously approved submittal item, Contractor shall be responsible for Engineer's charges to Owner for its review time, and Owner may impose a set-off against payments due to Contractor to secure reimbursement for such charges, unless the need for such change is beyond the control of Contractor.

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 and its officers, directors, members, partners, employees, agents, consultants, and subcontractors shall be entitled to rely on Contractor's warranty and guarantee.
- B. Contractor's warranty and guarantee hereunder excludes defects or damage caused by:
 1. abuse, modification, or improper maintenance or operation by persons other than Contractor, Subcontractors, Suppliers, or any other individual or entity for whom Contractor is responsible; or
 2. normal wear and tear under normal usage.
- C. Contractor's obligation to perform and complete the Work in accordance with the Contract Documents shall be absolute. None of the following will constitute an acceptance of Work that is not in accordance with the Contract Documents or a release of Contractor's obligation to perform the Work in accordance with the Contract Documents:

1. observations by Engineer;
 2. recommendation by Engineer or payment by Owner of any progress or final payment;
 3. the issuance of a certificate of Substantial Completion by Engineer or any payment related thereto by Owner;
 4. use or occupancy of the Work or any part thereof by Owner;
 5. any review and approval of a Shop Drawing or Sample submittal;
 6. the issuance of a notice of acceptability by Engineer;
 7. any inspection, test, or approval by others; or
 8. any correction of defective Work by Owner.
- D. 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 shall 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 and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to the performance of the Work, provided that any such claim, cost, loss, or damage is attributable to bodily injury, sickness, disease, or death, or to injury to or destruction of tangible property (other than the Work itself), including the loss of use resulting therefrom but only to the extent caused by any negligent act or omission of Contractor, any Subcontractor, any Supplier, or any individual or entity directly or indirectly employed by any of them to perform any of the Work or anyone for whose acts any of them may be liable.
- B. In any and all claims against Owner or Engineer or any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors by any employee (or the survivor or personal representative of such employee) of Contractor, any Subcontractor, any Supplier, or any individual or entity directly or indirectly employed by any of them to perform any of the Work, or anyone for whose acts any of them may be liable, the indemnification obligation under Paragraph 7.18.A shall not be limited in any way by any limitation on the amount or type of damages, compensation, or benefits payable by or for Contractor or any such Subcontractor, Supplier, or other individual or entity under workers' compensation acts, disability benefit acts, or other employee benefit acts.
- C. The indemnification obligations of Contractor under Paragraph 7.18.A shall not extend to the liability of Engineer and Engineer's officers, directors, members, partners, employees, agents, consultants and subcontractors arising out of:
1. the preparation or approval of, or the failure to prepare or approve maps, Drawings, opinions, reports, surveys, Change Orders, designs, or Specifications; or
 2. giving directions or instructions, or failing to give them, if that is the primary cause of the injury or damage.

7.19 *Delegation of Professional Design Services*

- A. Contractor will not be required to provide professional design services unless such services are specifically required by the Contract Documents for a portion of the Work or unless such services are required to carry out Contractor's responsibilities for construction means, methods, techniques, sequences and procedures. Contractor shall not be required to provide professional services in violation of applicable Laws and Regulations.
- B. If professional design services or certifications by a design professional related to systems, materials, or equipment are specifically required of Contractor by the Contract Documents, Owner and Engineer will specify all performance and design criteria that such services must satisfy. Contractor shall cause such services or certifications to be provided by a properly licensed professional, whose signature and seal shall appear on all drawings, calculations, specifications, certifications, and other submittals prepared by such professional. Shop Drawings and other submittals related to the Work designed or certified by such professional, if prepared by others, shall bear such professional's written approval when submitted to Engineer.
- C. Owner and Engineer shall be entitled to rely upon the adequacy, accuracy, and completeness of the services, certifications, or approvals performed by such design professionals, provided Owner and Engineer have specified to Contractor all performance and design criteria that such services must satisfy.
- D. Pursuant to this paragraph, Engineer's review and approval of design calculations and design drawings will be only for the limited purpose of checking for conformance with performance and design criteria given and the design concept expressed in the Contract Documents. Engineer's review and approval of Shop Drawings and other submittals (except design calculations and design drawings) will be only for the purpose stated in Paragraph 7.16.D.1.
- E. Contractor shall not be responsible for the adequacy of the performance or design criteria specified by Owner or Engineer.

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 utility work at or adjacent to the Site, Owner shall provide such information to Contractor.
- C. Contractor shall afford each other contractor that performs such other work, each utility owner performing other work, and Owner, if Owner is performing other work with Owner's employees, proper and safe access to the Site, and provide a reasonable opportunity for the introduction and storage of materials and equipment and the execution of such other work. 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.

- D. If the proper execution or results of any part of Contractor's Work depends upon work performed by others under this Article 8, 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.

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 at or adjacent to the Site for Owner, the Owner's employees, any other contractor working for Owner, or any utility owner 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, or both. 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 shall 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. When applicable, any such equitable adjustment in Contract Price shall 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 is conditioned on such adjustment being essential to Contractor's ability to complete the Work within the Contract Times.
- 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. 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 to 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.
- C. 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 to Contractor.

- D. 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 shall 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 Documents (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 10.08. 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 *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 Paragraph 10.08. If Owner designates another representative or agent to represent Owner at the Site who is not Engineer's consultant, agent, or employee, the responsibilities and authority and limitations thereon of such other individual or entity will be as provided in the Supplementary Conditions.

10.04 *Rejecting Defective Work*

- A. Engineer has the authority to reject Work in accordance with Article 14.

10.05 *Shop Drawings, Change Orders and Payments*

- A. Engineer's authority, and limitations thereof, as to Shop Drawings and Samples, are set forth in Paragraph 7.16.
- B. Engineer's authority, and limitations thereof, as to design calculations and design drawings submitted in response to a delegation of professional design services, if any, are set forth in Paragraph 7.19.
- C. Engineer's authority as to Change Orders is set forth in Article 11.
- D. Engineer's authority as to Applications for Payment is set forth in Article 15.

10.06 *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.

10.07 *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.

10.08 *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, shall create, impose, or give rise to any duty in contract, tort, or otherwise owed by Engineer to Contractor, any Subcontractor, any Supplier, any other individual or entity, or to any surety for or employee or agent of any of them.
- B. Engineer will not supervise, direct, control, or have authority over or be responsible for Contractor's means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or for any failure of Contractor to comply with Laws and Regulations applicable to the performance of the Work. Engineer will not be responsible for Contractor's failure to perform the Work in accordance with the Contract Documents.
- C. Engineer will not be responsible for the acts or omissions of Contractor or of any Subcontractor, any Supplier, or of any other individual or entity performing any of the Work.
- D. Engineer's review of the final Application for Payment and accompanying documentation and all maintenance and operating instructions, schedules, guarantees, bonds, certificates of inspection, tests and approvals, and other documentation required to be delivered by Paragraph 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 10.08 shall also apply to the Resident Project Representative, if any.

10.09 *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 (if any) of which Engineer has been informed.

ARTICLE 11 – AMENDING THE CONTRACT DOCUMENTS; CHANGES IN THE WORK

11.01 *Amending and Supplementing Contract Documents*

- A. The Contract Documents may be amended or supplemented by a Change Order, a Work Change Directive, or a Field Order.
 - 1. *Change Orders:*
 - a. If an amendment or supplement to the Contract Documents includes a change in the Contract Price or the Contract Times, such amendment or supplement must be set forth in a Change Order. A Change Order also may be used to establish amendments and supplements of the Contract Documents that do not affect the Contract Price or Contract Times.
 - b. Owner and Contractor may amend those terms and conditions of the Contract Documents that do not 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, without the recommendation of the Engineer. Such an amendment shall be set forth in a Change Order.
 - 2. *Work Change Directives:* 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 11.04 regarding change of Contract Price. Contractor must submit any Change Proposal seeking an adjustment of the Contract Price or the Contract Times, or both, no later than 30 days after the completion of the Work set out in the Work Change Directive. Owner must submit any Claim seeking an adjustment of the Contract Price or the Contract Times, or both, no later than 60 days after issuance of the Work Change Directive.
 - 3. *Field Orders:* 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. If Contractor believes that a Field Order justifies an adjustment in the Contract Price or Contract Times, or both, then before proceeding with the Work at issue, Contractor shall submit a Change Proposal as provided herein.

11.02 *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. Such changes shall be supported by Engineer's recommendation, to the extent the change involves the design (as set forth in the Drawings, Specifications, or otherwise), or other engineering or technical matters. Such changes 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 shall be performed under the applicable conditions of the Contract Documents. Nothing in this paragraph shall obligate 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.

11.03 *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.

11.04 *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 shall comply with the provisions of Paragraph 11.06. Any Claim for an adjustment of Contract Price shall 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); or
 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 11.04.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 11.04.C).
- C. *Contractor's Fee:* When applicable, the Contractor's fee for overhead and profit shall be determined as follows:
1. a mutually acceptable fixed fee; or
 2. if a fixed fee is not agreed upon, then a fee based on the following percentages of the various portions of the Cost of the Work:
 - a. for costs incurred under Paragraphs 13.01.B.1 and 13.01.B.2, the Contractor's fee shall be 15 percent;
 - b. for costs incurred under Paragraph 13.01.B.3, the Contractor's fee shall be five percent;
 - c. where one or more tiers of subcontracts are on the basis of Cost of the Work plus a fee and no fixed fee is agreed upon, the intent of Paragraphs 11.01.C.2.a and 11.01.C.2.b is that the

Contractor's fee shall be based on: (1) a fee of 15 percent of the costs incurred under Paragraphs 13.01.A.1 and 13.01.A.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 five 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 shall be no greater than 27 percent of the costs incurred by the Subcontractor that actually performs the work;

- d. no fee shall 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 will be the amount of the actual net decrease in cost plus a deduction in Contractor's fee by an amount equal to five percent of such net decrease; and
- f. when both additions and credits are involved in any one change, the adjustment in Contractor's fee shall be computed on the basis of the net change in accordance with Paragraphs 11.04.C.2.a through 11.04.C.2.e, inclusive.

11.05 *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 shall comply with the provisions of Paragraph 11.06. Any Claim for an adjustment in the Contract Times shall comply with the provisions of Article 12.
- B. An adjustment of the Contract Times shall be subject to the limitations set forth in Paragraph 4.05, concerning delays in Contractor's progress.

11.06 *Change Proposals*

- A. Contractor shall submit a Change Proposal to Engineer to request an adjustment in the Contract Times or Contract Price; appeal an initial decision by Engineer concerning the requirements of the Contract Documents or relating to the acceptability of the Work under the Contract Documents; contest a set-off against payment due; or seek other relief under the Contract. The Change Proposal shall specify any proposed change in Contract Times or Contract Price, or both, or other proposed relief, and explain the reason for the proposed change, with citations to any governing or applicable provisions of the Contract Documents.
 - 1. *Procedures:* Contractor shall submit each Change Proposal to Engineer promptly (but in no event later than 30 days) after the start of the event giving rise thereto, or after such initial decision. 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. The supporting data shall 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. Engineer will advise Owner regarding the Change Proposal, and consider any comments or response from Owner regarding the Change Proposal.
 - 2. *Engineer's Action:* Engineer will review each Change Proposal and, within 30 days after receipt of the Contractor's supporting data, either deny the Change Proposal in whole, approve it in whole, or deny it in part and approve it in part. Such actions shall 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.

3. *Binding Decision*: Engineer's decision will be final and binding upon Owner and Contractor, unless Owner or Contractor appeals the decision by filing a Claim under Article 12.
- B. *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 that the Engineer is unable to resolve the Change Proposal. For purposes of further resolution of such a Change Proposal, such notice shall be deemed a denial, and Contractor may choose to seek resolution under the terms of Article 12.

11.07 *Execution of Change Orders*

- A. Owner and Contractor shall execute appropriate Change Orders covering:
1. changes in the Contract Price or Contract Times which are agreed to by the parties, including any undisputed sum or amount of time for Work actually performed in accordance with a Work Change Directive;
 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 11.02, (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 in the Contract Price or Contract Times, or other changes, which embody the substance of any final and binding results under Paragraph 11.06, or Article 12.
- B. If Owner or Contractor refuses to execute a Change Order that is required to be executed under the terms of this Paragraph 11.07, it shall be deemed to be of full force and effect, as if fully executed.

11.08 *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 shall be submitted 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; and
 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.
- 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 **10** 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 shall rest with the party making the Claim. In the case of a Claim by Contractor seeking an increase in the Contract Times or Contract Price, or both, 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 shall 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 shall 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 shall 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 shall 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 shall 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 shall 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 shall be incorporated in a Change Order 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. 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 shall be in amounts no higher than those prevailing in the locality of the Project, shall not include any of the costs itemized in Paragraph 13.01.C, and shall include only the following items:
1. Payroll costs for employees in the direct employ of Contractor in the performance of the Work under schedules of job classifications agreed upon by Owner and Contractor. Such employees shall include, without limitation, superintendents, foremen, and other personnel employed full time on the Work. Payroll costs for employees not employed full time on the Work shall be apportioned on the basis of their time spent on the Work. Payroll costs shall include, but not be limited to, salaries and wages plus the cost of fringe benefits, which shall include social security contributions, unemployment, excise, and payroll taxes, workers' compensation, health and retirement benefits, bonuses, sick leave, and vacation and holiday pay applicable thereto. The expenses of performing Work outside of regular working hours, on Saturday, Sunday, or legal holidays, shall be included in the above to the extent authorized by Owner.
 2. Cost of all materials and equipment furnished and incorporated in the Work, including costs of transportation and storage thereof, and Suppliers' field services required in connection therewith. All cash discounts shall accrue to Contractor unless Owner deposits funds with Contractor with which to make payments, in which case the cash discounts shall accrue to Owner. All trade discounts, rebates, and refunds and returns from sale of surplus materials and equipment shall accrue to Owner, and Contractor shall make provisions so that they may be obtained.
 3. Payments made by Contractor to Subcontractors for Work performed by Subcontractors. If required by Owner, Contractor shall obtain competitive bids from subcontractors acceptable to Owner and Contractor and shall deliver such bids to Owner, who will then determine, with the advice of Engineer, which bids, if any, will be acceptable. If any subcontract provides that the Subcontractor is to be paid on the basis of Cost of the Work plus a fee, the Subcontractor's Cost of the Work and fee shall be determined in the same manner as Contractor's Cost of the Work and fee as provided in this Paragraph 13.01.
 4. Costs of special consultants (including but not limited to engineers, architects, testing laboratories, surveyors, attorneys, and accountants) employed for services specifically related to the Work.
 5. Supplemental costs including the following:
 - a. The proportion of necessary transportation, travel, and subsistence expenses of Contractor's employees incurred in discharge of duties connected with the Work.
 - b. Cost, including transportation and maintenance, of all materials, supplies, equipment, machinery, appliances, office, and temporary facilities at the Site, and hand tools not owned by the workers, which are consumed in the performance of the Work, and cost, less market value, of such items used but not consumed which remain the property of Contractor.
 - c. Rentals of all construction equipment and machinery, and the parts thereof, whether rented from Contractor or others in accordance with rental agreements approved by Owner with the advice of Engineer, and the costs of transportation, loading, unloading, assembly, dismantling, and removal thereof. All such costs shall be in accordance with the terms of

said rental agreements. The rental of any such equipment, machinery, or parts shall cease when the use thereof is no longer necessary for the Work.

- d. Sales, consumer, use, and other similar taxes related to the Work, and for which Contractor is liable, as imposed by Laws and Regulations.
- e. Deposits lost for causes other than negligence of Contractor, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable, and royalty payments and fees for permits and licenses.
- f. Losses and damages (and related expenses) caused by damage to the Work, not compensated by insurance or otherwise, sustained by Contractor in connection with the performance of the Work (except losses and damages within the deductible amounts of property insurance established in accordance with Paragraph 6.05), provided such losses and damages have resulted from causes other than the negligence of Contractor, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable. Such losses shall include settlements made with the written consent and approval of Owner. No such losses, damages, and expenses shall be included in the Cost of the Work for the purpose of determining Contractor's fee.
- g. The cost of utilities, fuel, and sanitary facilities at the Site.
- h. Minor expenses such as 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 shall not include any of the following items:

- 1. Payroll costs and other compensation of Contractor's officers, executives, principals (of partnerships and sole proprietorships), general managers, safety managers, engineers, architects, estimators, attorneys, auditors, accountants, purchasing and contracting agents, expeditors, timekeepers, clerks, and other personnel employed by Contractor, whether at the Site or in Contractor's principal or branch office for general administration of the Work and not specifically included in the agreed upon schedule of job classifications referred to in Paragraph 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. Expenses of Contractor's principal and branch offices other than Contractor's office at the Site.
- 3. Any part of Contractor's capital expenses, including interest on Contractor's capital employed for the Work and charges against Contractor for delinquent payments.
- 4. Costs due to the negligence of Contractor, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable, including but not limited to, the correction of defective Work, disposal of materials or equipment wrongly supplied, and making good any damage to property.
- 5. Other overhead or general expense costs of any kind and the costs of any item not specifically and expressly included in Paragraph 13.01.B.

D. *Contractor's Fee:* When the Work as a whole is performed on the basis of cost-plus, Contractor's fee shall be determined as set forth in the Agreement. When the value of any Work covered by a Change Order, Change Proposal, Claim, set-off, or other adjustment in Contract Price is determined on the basis of Cost of the Work, Contractor's fee shall be determined as set forth in Paragraph 11.04.C.

- E. *Documentation*: Whenever the Cost of the Work for any purpose is to be determined pursuant to this Article 13, Contractor will establish and maintain records thereof in accordance with generally accepted accounting practices and submit in a form acceptable to Engineer an itemized cost breakdown together with supporting data.

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 on account of any of the foregoing will be valid.
- C. *Contingency Allowance*: Contractor agrees that a contingency allowance, if any, is for the sole use of Owner to cover unanticipated costs.
- D. Prior to final payment, an appropriate Change Order will be issued as recommended by Engineer to reflect actual amounts due Contractor on account of Work covered by allowances, and the Contract Price shall be correspondingly adjusted.

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. **There will be no adjustments in unit price bid for increased or decreased quantities under this contract.**
Quantities for items listed on the Contractor's Proposal shall be measured during construction and the final measured quantities shall be used to determine the Contract Price. In order to complete the project in accordance with the intent of the plans and specifications, it is anticipated that quantities of several items will be more or less than estimated on the Contractor's Proposal.
- E. Engineer will determine the actual quantities and classifications of Unit Price Work performed by Contractor. Engineer will review with Contractor the Engineer's preliminary determinations on such matters before rendering a written decision thereon (by recommendation of an Application for Payment or otherwise). Engineer's written decision thereon will be final and binding (except as modified by Engineer to reflect changed factual conditions or more accurate data) upon Owner and Contractor, subject to the provisions of the following paragraph.

- F. Within 30 days of Engineer's written decision under the preceding paragraph, Contractor may submit a Change Proposal, or Owner may file a Claim, seeking an adjustment in the Contract Price if:
1. the quantity of any item of Unit Price Work performed by Contractor differs materially and significantly from the estimated quantity of such item indicated in the Agreement;
 2. there is no corresponding adjustment with respect to any other item of Work; and
 3. Contractor believes that it is entitled to an increase in Contract Price as a result of having incurred additional expense or Owner believes that Owner is entitled to a decrease in Contract Price, and the parties are unable to agree as to the amount of any such increase or decrease.

ARTICLE 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 will have access to the Site and the Work at reasonable times for their observation, inspection, and testing. Contractor shall provide them proper and safe conditions for such access and advise them of Contractor's safety procedures and programs so that they may comply therewith as applicable.

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 shall 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 shall 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 shall 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 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 shall 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 special 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, or both, directly attributable to such uncovering, exposure, observation, inspection, testing, replacement, and reconstruction. If the parties are unable to agree as to the amount or extent thereof, 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 shall not give rise to any duty on the part of Owner to exercise this right for the benefit of Contractor, any Subcontractor, any Supplier, any other individual or entity, or any surety for, or employee or agent of any of them.

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 rejected Work as required by Engineer, or if Contractor fails to perform the Work in accordance with the Contract Documents, or if Contractor fails to comply with any other provision of the Contract Documents, then Owner may, after seven days written notice to Contractor, correct or remedy any such deficiency.
- B. In exercising the rights and remedies under this Paragraph 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 on account of 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. If payment is requested on the basis of materials and equipment not incorporated in the Work but delivered and suitably stored at the Site or at another location agreed to in writing, the Application for Payment shall also be accompanied by a bill of sale, invoice, or other documentation warranting that Owner has received the materials and equipment free and clear of all Liens, and evidence that the materials and equipment are covered by appropriate property insurance, a warehouse bond, or other arrangements to protect Owner's interest therein, all of which must be satisfactory to Owner.
 - 2. Beginning with the second Application for Payment, each Application shall include an affidavit of Contractor stating that all previous progress payments received on account of the Work have been applied on account to discharge Contractor's legitimate obligations associated with prior Applications for Payment.
 - 3. The amount of retainage with respect to progress payments will be as follows:
 - a. Minnesota Contractor's -5%
 - b. Exempt Non-Minnesota Contractors -5%
 - c. Non-Exempt Non-Minnesota Contractors -5% + 8%=13%
 - d. *State Surety Deposit
 - 1) Non-Minnesota Contractors are advised to file Form SD-3 with the Minnesota Department of Revenue to determine their exemption status.
- 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, or
 - b. for the means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or
 - c. for Contractor's failure to comply with Laws and Regulations applicable to Contractor's performance of the Work, or
 - d. to make any examination to ascertain how or for what purposes Contractor has used the money paid on account of the Contract Price, or
 - e. to determine that title to any of the Work, materials, or equipment has passed to Owner free and clear of any Liens.
5. Engineer may refuse to recommend the whole or any part of any payment **if the established Contract Time for Substantial Completion has expired or**, 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 on account of Contractor's conduct in the performance or furnishing of the Work, or Owner has incurred costs, losses, or damages on account of 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 that would constitute a default by Contractor and therefore justify a termination for cause has occurred;
 - j. liquidated 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;
 - l. there are other items entitling 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 shall 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 shall be treated as an amount due as determined by Paragraph 15.01.C.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 seven 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 shall 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 seven 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 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 6.05 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 7.11), and other documents, Contractor may make application for final payment.
2. The final Application for Payment shall 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 disputes that Contractor believes are unsettled; 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.
 4. Before final application for payment is made for the work, CONTRACTOR must make satisfactory showing of compliance with M.S.A. §290.92 which requires the withholding of state income taxes for wages paid employees on this project. Submittal of Certificate of Compliance from the Commissioner of Taxation to the OWNER will satisfy this requirement. CONTRACTOR is advised that before such certificate can be issued, he must first place on file with the Commissioner of Taxation an affidavit that he has complied with the provisions of M.S.A. §290.92. The required affidavit form will be supplied by the Commissioner of Taxation, Centennial Building, St. Paul, Minnesota, on request.
- B. *Engineer's Review of Application and Acceptance:*
1. If, on the basis of Engineer's observation of the Work during construction and final inspection, and Engineer's review of the final Application for Payment and accompanying documentation as required by the Contract Documents, Engineer is satisfied that the Work has been completed and Contractor's other obligations under the Contract have been fulfilled, Engineer will, within ten days after receipt of the final Application for Payment, indicate in writing Engineer's recommendation of final payment and present the Application for Payment to Owner for payment. Such recommendation shall 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. At the same time Engineer will also give written notice to Owner and Contractor that the Work is acceptable, subject to the provisions of Paragraph 15.07. 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. *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.
- D. *Payment Becomes Due:* Thirty days after the presentation to Owner of the final Application for Payment and accompanying documentation, the amount recommended by Engineer (less any further sum Owner is entitled to set off against Engineer's recommendation, including but not limited to set-offs for liquidated damages and set-offs allowed under the provisions above with respect to progress payments) will become due and shall be paid by Owner to Contractor.

15.07 *Waiver of Claims*

- A. The making of final payment will not constitute a waiver by Owner of claims or rights against Contractor. Owner expressly reserves claims and rights arising from unsettled Liens, from defective Work appearing after final inspection pursuant to Paragraph 15.05, from Contractor's failure to comply with the Contract Documents or the terms of any special guarantees specified therein, from

outstanding Claims by Owner, or from Contractor's continuing obligations under the Contract Documents.

- 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 or appealed under the provisions of Article 17.

15.08 *Correction Period*

- A. If within **two** years after the date of Substantial Completion (or such longer period of time as may be prescribed by the terms of any applicable special guarantee required by the Contract Documents, or by any specific provision of the Contract Documents), any Work is found to be defective, or if the repair of any damages to the Site, adjacent areas that Contractor has arranged to use through construction easements or otherwise, and other adjacent areas used by Contractor as permitted by Laws and Regulations, is found to be defective, then 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 other adjacent areas;
 - 2. correct such defective Work;
 - 3. if the defective Work has been rejected by Owner, remove it from the Project and replace it with Work that is not defective, and
 - 4. satisfactorily correct or repair or remove and replace any damage to other Work, to the work of others, or to other land or areas resulting therefrom.
- B. If Contractor does not promptly comply with the terms of Owner's written instructions, or in an emergency where delay would cause serious risk of loss or damage, Owner may have the defective Work corrected or repaired or may have the rejected Work removed and replaced. Contractor shall pay all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such correction or repair or such removal and replacement (including but not limited to all costs of repair or replacement of work of others).
- C. In special circumstances where a particular item of equipment is placed in continuous service before Substantial Completion of all the Work, the correction period for that item may start to run from an earlier date if so provided in the Specifications.
- D. Where defective Work (and damage to other Work resulting therefrom) has been corrected or removed and replaced under this paragraph, the correction period hereunder with respect to such Work will be extended for an additional period of one year after such correction or removal and replacement has been satisfactorily completed.
- E. Contractor's obligations under this paragraph are in addition to all other obligations and warranties. The provisions of this paragraph shall not 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, or both, directly attributable to any such suspension. Any Change Proposal seeking such adjustments shall 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) ten 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) 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 seven 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 shall govern over any inconsistent provisions of Paragraphs 16.02.B and 16.02.D.

16.03 *Owner May Terminate For Convenience*

- A. Upon seven days written notice to Contractor and Engineer, Owner may, without cause and without prejudice to any other right or remedy of Owner, terminate the Contract. In such case, Contractor shall be paid for (without duplication of any items):
 - 1. completed and acceptable Work executed in accordance with the Contract Documents prior to the effective date of termination, including fair and reasonable sums for overhead and profit on such Work;
 - 2. expenses sustained prior to the effective date of termination in performing services and furnishing labor, materials, or equipment as required by the Contract Documents in connection with uncompleted Work, plus fair and reasonable sums for overhead and profit on such expenses; 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 on account of loss of anticipated overhead, profits, or revenue, 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 seven days written notice to Owner and Engineer, and provided Owner or Engineer do not remedy such suspension or failure within that time, terminate the contract and recover from Owner payment on the same terms as provided in Paragraph 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, seven days after written notice to Owner and Engineer, stop the Work until payment is made of all such amounts due Contractor, including interest thereon. The provisions of this paragraph 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; and
 - 2. Disputes between Owner and Contractor concerning the Work or obligations under the Contract Documents, and arising 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; or

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 Documents requires the giving of written notice, it will be deemed to have been validly given if:
 1. delivered in person, by a commercial courier service or otherwise, to the individual or to a member of the firm or to an officer of the corporation for which it is intended; or
 2. delivered at or sent by registered or certified mail, postage prepaid, to the last business address known to the sender of the notice.

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 shall not constitute a waiver of that provision, nor shall 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 or completion of the Contract or termination 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 *Headings*

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

SUMMARY OF WORK & SUPPLEMENTARY CONDITIONS

SUMMARY OF WORK

The work done under this contract shall include the furnishing of all labor, materials, tools and equipment to construct complete in place the following items:

1. Street reconstruction including granular borrow, aggregate base, bituminous milling, and bituminous surfacing.
2. Storm sewer installation, replacement and repair.
3. Watermain removal and installation, including, but not limited to, directional drilling installation.
4. Drain tile and concrete curb and gutter installation and replacement.
5. Common and Subgrade Excavation.

SUPPLEMENTARY CONDITIONS

These Supplementary Conditions amend or supplement the Standard General Conditions of the Construction Contract (No. C-700, 2013 Edition) and other provisions of the Contract Documents as indicated below. All provisions which are not so amended or supplemented remain in full force and effect.

The terms used in these Supplementary Conditions which are defined in the Standard General Conditions of the Construction Contract (No. C-700, 2013 Edition) have the meanings assigned to them in the General Conditions.

S.C. 2 - Subsurface and Physical Conditions

In the preparation of Drawings and Specifications, ENGINEER or ENGINEER'S consultant have relied upon:

- .2.A The following reports of explorations and tests of subsurface conditions at the site of the Work:
 - .2.A.1 City As-Built records and Design Locate responses from utility companies.
 - .2.A.2 Report dated January 10, 2018 – Braun Intertec - Geotechnical Evaluation Report

S.C. 3 – Builder's Risk Insurance

Builder's Risk Insurance as specified in 6.05 of the Standard General Conditions shall not be required for this project.

S.C. 4 – Coordination with Private Utilities

It shall be the responsibility of the CONTRACTOR to coordinate work with private utility owners. The CONTRACTOR shall not be entitled to an adjustment in Contract time for project delays due

to relocation or protection of in place private utilities resulting from inadequate coordination as determined by the ENGINEER.

S.C. 5 – Regulatory Agencies

In addition to the regulator agencies listed in the Standard General Conditions of the Construction Contract, the Specification, and elsewhere in this Contract, the following regulatory agencies have jurisdiction:

1. Bassett Creek Watershed Management Commission
2. MN Pollution Control Agency

S.C. 6 – Supervision and Superintendence

The following shall be in addition to 7.01 of the Standard General Conditions.

1. If the CONTRACTOR is not in compliance with this section he shall be assessed at a rate of \$500.00 per day, to be deducted from the Mobilization bid item, that the Engineer determines the CONTRACTOR has not complied.

S.C. 7– Specifications

The following additions, removals, or modifications to the Specifications shall apply:

01100 – Mobilization

- A. Contractor shall construct project in the stages & sequencing identified in plans and specifications unless approved by Engineer.
- B. Contractor shall submit staging & sequencing plan and project schedule to the Engineer at least 1 week prior to preconstruction conference.
- C. Approval of Engineer shall be required before starting construction.
- D. Any deviation of staging & sequencing plan shall require approval of Engineer.
- E. Any additional mobilizations of subcontractors required to construct project in stages shall be considered incidental.

01400 – Erosion Control

01400.35 Erosion Control Supervisor

The CONTRACTOR shall provide an Erosion Control Supervisor in accordance with MnDOT Specification 2573.3 A.

01400.7 Execution

If the CONTRACTOR is negligent in adhering to erosion control requirements of the project plans, specifications, applicable permitting, or the direction of the ENGINEER they may be assessed at a rate of \$500.00 per violation per day, to be deducted from the mobilization bid item, that the ENGINEER determines that the CONTRACTOR has not complied.

- A. Silt Fence
 - a. Silt Fence shall be type MS (Machine Sliced), or installed by manual methods in accordance with City Plate ST-18.
- B. Inlet Protection Type – Special
 - a. Payment includes placement, removal, and replacement as required at designated location.
 - b. Inlet protection shall be placed at all catch basins, onsite and offsite, that receive runoff from the project.

- C. Measurement for erosion control items shall be in accordance with the appropriate units on the Bid Form.

01500 – Air, Land and Water Pollution (MnDOT 1717)

Pollution of natural resources of air, land and water by operations under this Contract shall be prevented, controlled, and abated in accordance with the rules, regulations, and standards adopted and established by the Minnesota Pollution Control Agency (MPCA), and in accordance with the provisions of MnDOT 1717, these Special Provisions, and the following:

- A. The Contractor shall furnish, install, and maintain temporary and permanent erosion and sediment contractor devices in accordance with the provisions of 2105.5, 2573, 2575, as shown in the Plans, and in accordance with the provisions of the Special Provisions.

The City of Plymouth will apply for and receive coverage under the above mentioned permit by signing both the Owner's and Contractor's certification blanks on the permit application. Upon award of the Contract, the City of Plymouth and the Contractor shall execute the Storm Water Permit Transfer/Modification Application form, and submit it to the MPCA. The Storm Water Permit Transfer Modification Application will amend the original permit application thereby making both the City and the Contractor co-permittees for the requirement of the General Permit, "Authorization to Discharge Storm Water."

- B. This is no fee for the transfer of the permit. Work may not begin until all transfer permit forms are signed and dated and the Contractor identifies by name a person knowledgeable and experienced in the application and implementation of the Storm Water Pollution Prevention Plan, and has developed a chain of responsibility for all operators (subcontractors) on the site, in accordance to Part III.A.1 of the General Permit.
- C. The Contractor shall be solely responsible for complying with the requirements listed in Part II.B and Part IV of the General Permit.

The Contractor shall be responsible for providing all inspections, documentation, record keeping, maintenance, remedial actions, and repairs required by the permit. All inspections, maintenance, and records required in the General Permit Paragraphs IV.E, shall be the sole responsibility of the Contractor. The word "Permittee" in these referenced paragraphs shall mean "Contractor". Standard forms for logging all required inspection and maintenance activities shall be used by the Contractor. All inspection and maintenance forms used on this Project shall be turned over to the Engineer every two weeks for retention in accordance with the permit.

The Contractor shall have all logs, documentation, inspection reports on site for the Engineer's review and shall post the permit and MPCA's letter of coverage on site. The Contractor shall immediately rectify any shortcomings noted by the Engineer. All meetings with the MPCA, Watershed District, WMO, or any local authority shall be attended by both the Engineer and the Contractor or their representatives. No work required by said entities, and for which the Contractor would request additional compensation from the City of Plymouth, shall be started without approval from the Engineer. No work required by said entities and for which the changes will impact the design or requirements of the Contract documents or impact traffic shall be started without approval from the Engineer.

The Contractor shall immediately notify the Engineer of any site visits by Local Permitting Authorities performed in accordance with Part V.H.

Emergency Best Management Practices must be enacted to help minimize turbidity of surface waters and relieve runoff from extreme weather events. It is required to notify the MPCA Regional Contact Person within 2 days of an uncontrolled storm water release. The names and phone numbers of the MPCA Regional Contract personnel can be found at: <http://www.pca.state.mn.us/water/stormwater/stormwater-c.html>. The Contractor is reminded that during emergency situations involving uncontrolled storm water releases that the State Duty Officer must be contacted immediately at 1-800-422-0798 or 1-651-649-5451.

The Contractor shall review and abide by the instructions contained in the permit package. The Contractor shall hold the City of Plymouth harmless for any fines or sanctions caused by the Contractor's actions or inactions regarding compliance with the permit or erosion control provisions of the Contract Documents.

01600 – Traffic Control and Detours

01600.5 Traffic Control Supervisor

The Contractor shall provide a Traffic Control Supervisor for all major traffic control modifications to the Project in accordance with Contract provisions and as directed by the Engineer.

The Contractor shall provide a Traffic Control Supervisor for all major traffic control modifications listed below:

- A. Initial startup of the Project
- B. Whenever any bypass is placed into operation
- C. Completion of the Project
- D. Any other major changes to the Traffic Control set-up (due to Contractors staging of operations)

The Traffic Control Supervisor shall be on site 3 days prior to all major traffic control modifications listed above until the major traffic control modification is functioning properly allowing for safe, long term accommodations for traveling public.

During the 3-day time period prior to the major traffic control modification, the Traffic Control Supervisor will be expected to be on-site to develop a site plan for the major traffic control modification, to determine and ensure timely delivery of the proper quantity of traffic control devices, and to develop staging plans for the major traffic control modification operation. The Traffic Control Supervisor shall then coordinate and direct the installation of the devices as well as the staging of the traffic control modification to ensure a safe and efficient transition is completed. Following the transition, the Traffic Control Supervisor shall monitor the traffic flow of the site(s) in question and make modifications necessary to provide for the safe and efficient passage of the traveling public.

The Traffic Control Supervisor shall be certified as a worksite supervisor by MnDOT. A copy of the traffic Control Supervisor's certification shall be provided to the Engineer at the Project pre-construction conference. MnDOT certification as a Traffic Control Supervisor can be obtained by attending a 3-day MnDOT Traffic Control Supervisor Course within the last 5 years.

The Contractor shall, at the pre-construction conference, designate a Traffic Control Supervisor who shall be responsible for and perform the traffic control management. The traffic Control Supervisor shall be either an employee of the

Contractor other than the superintendent, or an employee of a firm which has a subcontract for overall traffic control management for the project. The Traffic Control Supervisor shall be responsible for the management of the traffic control operations of the Project, including those of the Contractor, subcontractors, and suppliers. The primary responsibility of the Traffic Control Supervisor shall be the Traffic Control Management of this Project.

The Traffic Control Supervisor shall have the authority needed to effectively require modifications and maintenance of traffic controls. This includes having the authority necessary to obtain and use all labor, equipment, and materials needed to provide and maintain traffic control in routine and in emergency situations.

Traffic control management by the Traffic Control Supervisor includes, but is not limited to:

- A. Ensuring that traffic control devices are functioning as required. This includes the repair or replacement of all signs, barricades, and other traffic devices that become damaged, moved, or destroyed, or lights that cease to function properly, and barricade weights that are damaged or otherwise fail to stabilize barricades.
- B. Providing sufficient surveillance of signs, barricades, and other traffic control devices. This includes inspecting traffic control devices on every calendar day that traffic control devices are in use (by the Traffic Control Supervisor or his approved representative). Routine surveillance reports shall be submitted to the Project engineer weekly.
- C. The Traffic Control Supervisor will be on the Project every working day, "on call" at all times, and available within 45 minutes of notification, at other than normal working hours. The Contractor shall give the Engineer, the names, addresses, and phone numbers of at least three individuals (one of which is the Traffic Control Supervisor) responsible to provide and ensure immediate attention to the traffic control management.

Traffic Control Supervisor shall be provided by the Contractor during the time periods indicated above. For any period of time the Traffic Control Supervisor is not available to provide traffic control management, the Contractor will be subject to an hourly charge assessed at a rate of \$250.00 per hour for each hour or any portion thereof which the Engineer determines that the Contractor has not complied.

01600.7 Sequencing and Scheduling

B.2.A If the CONTRACTOR is negligent in adhering to the established time schedules he shall be subject to an hourly charge assessed at a rate of \$500.00 per hour, to be deducted from the mobilization bid item, for each hour or any portion thereof with which the ENGINEER determines that the CONTRACTOR has not complied.

B.11 Hwy 55 Frontage Road shall remain open to through traffic and all businesses and properties at all times, unless specifically authorized by the ENGINEER. Hwy 55 Frontage Road may be reduced to one 11-foot travel lane in one direction through the project site. Contractor shall provide traffic control plan per 01600.7.C, if he proposes to restrict Hwy 55 Frontage Road to one-way traffic. The following restrictions will apply, if one-way traffic is implemented:

- One-way traffic shall be in the eastbound direction, with westbound traffic detoured to TH 55, except Mister Car Wash traffic shall be allowed to exit toward W. Medicine Lake Dr. in the westbound direction.
- Permits and/or authorization required by MnDOT shall be the sole responsibility of the Contractor.
- Advanced warning signs shall be provided 7 calendar days prior to switch.
- Affected property owners shall be notified 7 calendar days prior to switch.
- Signs shall be provided stating "Access to [Businesses Name]" with directional arrow for each affected business and commercial property along the detour route.
- One-way signs within the project area will be required for traffic entering the construction site from adjacent properties.
- All detour and additional signs and traffic control plan required herein would be incidental to Traffic Control lump sum pay item

In locations that two-way traffic is maintained, two 11-foot travel lanes shall be provided and maintained.

B.12 The CONTRACTOR shall phase work to minimize traveling publics use of unpaved roadways. Traveling public shall only be allowed to travel on paved or compacted aggregate surfaces. Removal of existing bituminous surface will not be allowed until the temporary watermain has been installed and accepted, and proposed watermain installed by directional drilling is substantially complete. Hwy 55 Frontage Road traffic shall be allowed to travel on an aggregate surface for **no greater than 60 calendar days**. The CONTRACTOR shall be subject to a daily charge assessed at a rate of \$500.00 for each day or any portion thereof, to be deducted from the mobilization bid item, with which the ENGINEER determines that the CONTRACTOR has not complied.

B.13 The CONTRACTOR shall phase work to minimize disruptions to access to adjacent properties. The Contractor shall notify property owners 3 business days prior to affecting access. All adjacent properties must have access through the project site at all times. The CONTRACTOR will be allowed a one-time closure of **no greater than 5 consecutive calendar days** to close any commercial driveway. This closure period is for the removal of existing driveway, installation of new driveway, curing period for concrete, and bituminous driveway tie-ins. It is anticipated that high early strength concrete as defined by Specification 2461 will be required for concrete driveway aprons. The CONTRACTOR shall be subject to a daily charge assessed at a rate of \$500 for each day or any portion thereof, to be deducted from the mobilization bid item, with which the ENGINEER determines that the CONTRACTOR has not complied.

B.14 It is anticipated that temporary aggregate base materials, temporary backfilling, temporary earthwork, and out-of-sequence work will be required to maintain access through the project site. It is additional anticipated that temporary widening of the Hwy 55 Frontage Road may be needed to the south (toward TH 55) in order to complete work. All costs, including labor, equipment and materials, incurred to maintain traffic through the site, as specified herein shall be incidental to Traffic Control lump sum pay item.

01600.8 Maintenance

Paragraph D shall be deleted and replaced with the following. The CONTRACTOR shall be required to respond immediately to any call from the ENGINEER or his representative concerning the maintenance of all traffic control devices. If the CONTRACTOR is negligent in correcting the deficiency within one day of notification the CONTRACTOR shall be subject to a daily charge assessed at a rate of \$500 for each day or any portion thereof, to be

deducted from the mobilization bid item, with which the ENGINEER determines that the CONTRACTOR has not complied.

E If at any time the CONTRACTOR fails to, in a timely manner, properly furnish, install, maintain, or remove any of the required traffic control devices, the ENGINEER reserves the right to correct the deficiency. Each time the ENGINEER takes such corrective action, the costs thereof, including mobilization, plus \$1,000 will be deducted from the mobilization bid item.

01600.9 Equipment

A.8 "Businesses Open During Construction" signs to be provided at both ends of project.

01600.10 Execution

J. The CONTRACTOR shall be required to respond immediately to any call from the ENGINEER or his representative concerning any request for improving or correcting traffic control. If the CONTRACTOR is negligent in correcting the deficiency within one hour of the notification the CONTRACTOR shall be subject to an hourly charge assessed at a rate of \$250 per hour, to be deducted from the mobilization bid item, for each hour or any portion thereof with which the ENGINEER determines that the CONTRACTOR has not complied.

01800 – Contractor Signs

A. The number of project signs required is two with one posted at each end of the project as directed by the Engineer.

02000 – Removing Pavement and Miscellaneous Structures

A. Measurement for items shall be in accordance with the appropriate units on the Bid Form.

B. Salvage & Install Sprinkler Head

- a. Includes all labor and materials necessary to salvage, protect, reinstall, or replace sprinkler heads and supply lines, including any coordination with property owners and business, as necessary.
- b. New materials shall be of similar quality as existing materials.

C. Mill Bituminous Surface (1.5")

- a. Mill pavement on roadway to a depth of 1.5" as directed by the Engineer.
- b. Protect curb when milling pavement.
- c. Any drop-off where traffic will cross from or to the in-place surface, or from or to the milled surface, shall be tapered and/or chamfered so as to provide for the safe passage of traffic.
- d. The CONTRACTOR shall not mill any notches for surfacing tapers until immediately prior to paving, except that with the ENGINEER'S permission, the CONTRACTOR may mill the notches and install and maintain temporary bituminous tapers to provide for the safe passage of traffic until the surfacing taper is installed.
- e. No milled surface shall be left open to traffic for more than 7 consecutive days prior to being overlaid.

D. Remove Concrete Sidewalk & Median

- a. Measurement shall be in accordance with the appropriate units on the Bid Form.
- b. Includes all labor and materials necessary remove existing concrete sidewalk & median as shown on the plans and identified by the ENGINEER in the field.

E. Remove Bituminous Trail

- a. Measurement shall be in accordance with the appropriate units on the Bid Form.
- b. Includes all labor and materials necessary remove existing bituminous trail as shown on the plans and identified by the ENGINEER in the field.

- F. Remove Sign
 - a. Measurement shall be in accordance with the appropriate units on the Bid Form.
 - b. Includes all labor and materials necessary remove existing signs as shown on the plans and identified by the ENGINEER in the field.
- G. Salvage Sign
 - a. Measurement shall be in accordance with the appropriate units on the Bid Form.
 - b. Includes all labor and materials necessary to salvage existing signs as shown on the plans and identified by the ENGINEER in the field.
 - c. New signs will be installed by City Public Works staff at the completion of the project. The CONTRACTOR shall coordinate salvaging of signs & placement of new signs with the City. The CONTRACTOR shall deliver salvaged signs to the City Public Works facility.

02020 – Excavation and Embankment

- A. Ditch Grading
 - a. Ditch grading shall be performed as designated on the plan and as directed by the Engineer.
 - b. All excess graded material shall be the property of the CONTRACTOR and disposed of outside of project limits.
 - c. Measurement shall be in accordance with the appropriate units on the Bid Form.

02100 – Sanitary Sewer Construction

- A. Install Manhole Sealing System
 - a. Measurement shall be in accordance with the appropriate units on the Bid Form.
 - b. Includes all labor and materials necessary to install an appropriate manhole sealing system as approved by the ENGINEER.

02200 - Watermain Construction

- A. Disruptions to water service shall be completed outside of operating hours of affected businesses. It is anticipated that this will require night work. Affected businesses and property owners shall be notified a minimum of 48-hours prior to shutdown.
- B. Wet Tap to Existing Water Main
 - a. Measurement shall be in accordance with the appropriate units on the Bid Form.
 - b. Includes all labor and materials necessary to connect to existing watermain.
- C. Adjust Gate Valve
 - a. Measurement shall be in accordance with the appropriate units on the Bid Form.
 - b. Includes all labor and materials necessary to adjust existing gate valve. Including furnishing and installing bituminous patching materials, if required to complete adjustment.

02300 – Storm Sewer Construction

- A. Abandon Storm Sewer Pipe
 - a. Contractor shall fill pipe with sand or flowable fill and shall cut, remove, and plug a minimum of 2 feet of pipe adjacent to the end of the abandonment.
 - b. Shall include bulk heading of manholes and catch basins.
- B. Connect RC Pipe to Existing Storm Sewer Structure
 - a. Measurement shall be in accordance with the appropriate units on the Bid Form.
 - b. Includes all labor and materials necessary to connect new RC Pipe to existing structure.
- C. Connect Drintile to Storm Sewer Structure
 - a. Measurement shall be in accordance with the appropriate units on the Bid Form.
 - b. Includes all labor and materials necessary to connect new drintile to storm sewer structure.

- D. Manholes and Catch Basins
 - a. Casting shall be paid for in accordance with the appropriate item on the Bid Form.
 - b. Casting Bid Item includes all labor and materials necessary to install said Bid Item.
- E. Adjust Frame and Ring Casting
 - a. Measurement shall be in accordance with the appropriate units on the Bid Form.
- F. Aggregate Bedding
 - a. Measurement shall be in accordance with the appropriate units on the Bid Form of material acceptably placed.
 - i. Certified weight tickets must be provided.
 - b. Material shall be $\frac{3}{4}$ inch to $1\frac{1}{2}$ inch sound mineral product.
 - c. Place only as directed by Engineer to stabilize the trench bottom.
 - d. Includes removal and disposal of material which it replaces.
- G. Insulate Storm Sewer (4")
 - a. Measurement shall be in accordance with the appropriate units on the Bid Form.
 - b. The high density insulation shall be placed immediately below the pipe and extend laterally an additional 2 feet beyond the edges of the pipe. The pipe shall then be backfilled to the top of pipe elevation with a non-frost susceptible soil. The non-frost susceptible soil shall be graded such that less than 5 percent of the materials passes the #200 sieve and less than 50 percent passes the #40 sieve.
 - c. Includes all labor and materials necessary to install insulation.
- H. Manhole/Catch Basin Repair
 - a. Measurement shall be in accordance with the appropriate units on the Bid Form.
 - b. Includes all labor and materials necessary to repair existing manholes and/or catch basins as approved by the ENGINEER.

02400 – Street Construction

- A. Measurement
 - a. Shall be in accordance with the appropriate units on the Bid Form.
 - b. Aggregate Base CL 5 (CV)
 - i. Measurement of volume shall be compacted volume of material in place.
 - c. Trail/Sidewalk Aggregate Base CL. 5 (CV)
 - i. Measurement of volume shall be compacted volume of material in place.
 - d. Driveway Base, Agg. CL. 5 (CV)
 - i. Measurement of volume shall be compacted volume of material in place.
 - e. Select Granular Borrow (CV)
 - i. Measurement of volume shall be compacted volume of material in place.
 - f. 3" Minus Recycle Material
 - i. Measurement shall be in accordance with the appropriate units on the Bid Form.
- B. Installation of Concrete Curb and Gutter
 - a. Contractor shall be required to coordinate access with property owners and businesses prior to placement of curb and gutter.
 - b. Where a special access consideration exists as determined by Engineer, the Contractor may be required to pour curb at driveway access in two pour so-as to maintain access to homeowner or business. Additional mobilization required to construct special access driveways in two pours shall be considered incidental.
- C. Landscape Rock
 - a. Measurement shall be in accordance with the appropriate units on the Bid Form.
 - b. Includes all labor and materials necessary to furnish and install landscape rock. Material used as landscape rock shall be approved by the ENGINEER.
- D. Groundwater may be encountered during various construction activities including, but not limited to, watermain and storm sewer construction. All labor, materials, equipment, and other costs associated with dewatering shall be incidental.

02403.4 – Commercial Driveways – Materials

Commercial concrete driveways shall utilize high early strength concrete as defined by Specification 2461, unless otherwise authorized by the ENGINEER.

S.C. 8 – Cooperation By Contractors

A. The provisions of MnDOT 1505 are supplemented as follows:

- a. It is anticipated that construction activities for a project located within the property at 11318 Hwy 55, Plymouth, MN 55447 (Mister Car Wash) may coincide with the HWY 55 Frontage Road Reconstruction project. It shall be the responsibility of the Contractor, as well as all subcontractors, to coordinate construction activities with the third party's representatives. The Contractor shall make reasonable accommodations for the third party's construction contractor and representatives to access the site as needed for their work. All additional coordination shall be incidental.

S.C. 9 – Sales Tax Exemption

The Contractor, as well as all subcontractors, are required to submit the included sales tax exemption form. All completed forms from subcontractors shall be collected and submitted to the City by the Contractor. Forms shall be submitted prior to final payment being issued.

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SECTION 01050
WEEKLY CONSTRUCTION MEETINGS

01050.1 DESCRIPTION

A weekly construction meeting will be held at either the construction field office, on site or the ENGINEER'S office. The meeting will be attended by the CONTRACTOR'S superintendent and representatives from all subcontractors currently working on the project. The CONTRACTOR and subcontractors will be prepared to discuss project progress and scheduling and will outline the exact work to be performed in the following week. They will also indicate dates and times for any change in detours or street closings. The meeting will be open to the public and will likely include public officials, City staff, property owners, private utility representatives and the project ENGINEER with engineering staff.

01050.2 REFERENCES

- A. [Section 02990](#) - Measurement and Payment

END OF SECTION

SECTION 01100

MOBILIZATION

01100.1 DESCRIPTION

This section covers preparatory work including movement of personnel, equipment, supplies and incidentals to the project site. And establishment of the Contractor offices and facilities.

01100.2 REFERENCES

- A. [Section 01800](#) - Contractor Signs
- B. [Section 02990](#) - Measurement and Payment

01100.3 PERFORMANCE REQUIREMENTS

The following shall be completed before mobilization payment can be processed.

- A. Submittal of information listed under 01104 found below.
- B. Installation of project signs.
- C. Contact utilities to locate and mark all underground lines and facilities, before excavation. It is the CONTRACTOR'S responsibility to protect all existing utilities and improvements.
- D. Commencement of work.
- E. Final cleanup of site.

01100.4 SUBMITTALS

The following shall be completed before mobilization payment can be processed.

- A. Approved Project Schedule.
- B. Traffic Control Plan conforming to [Section 01600](#).
- C. List of Subcontractors.
- D. List of Suppliers.
- E. Material and Procedural submittals as required.

END OF SECTION

SECTION 01200

TEMPORARY DOMESTIC WATER

01200.1 DESCRIPTION

This section addressed the delivery, if required of temporary domestic water to the City's water customers during construction.

01200.2 REFERENCES

- A. [Section 02990](#) - Measurement and Payment

01200.3 PRODUCTS

- A. Materials used for temporary domestic water shall be certified/listed for potable water use meeting all applicable plumbing codes or standards including, but not limited, to the following:
 - a. The most current version of the Minnesota Plumbing Code
 - b. NSF/ANSI 14
 - c. NSF/ANSI 61
- B. Pipe Sizes
 - a. Main line pipe shall be 2-1/2" diameter.
 - b. Service lines to homes shall be 5/8" diameter.
- C. Connections to homes shall include a dual hose bib connection "Y" with shut offs.
- D. Hydrant connection shall have a 2-1/2" (removable handle valve) single connection or a wye with 2-1/2" (removable handle valve) dual connections at the hydrant. One 2-1/2" hydrant connection shall be used by the Fire Department.

01200.4 SUBMITTALS

CONTRACTOR shall provide the following for review and approval prior to installation of Temporary Domestic Water system.

- A. Documentation that materials meet requirements of section 01200.3.

01200.5 INSTALLATION

- A. Connection to City hydrants is not allowed except to provide temporary water hook-ups to existing homes during the watermain replacement as approved by the Engineer.
- B. Water service shall be maintained to all homes before 9:00 am and after 3:00 pm each weekday and maintained all day on weekends. Contractor to give notice to all residents' 24-hours prior to any scheduled water shut-offs.
- C. Contractor to provide two emergency phone numbers for 24-hour availability.
- D. Piping connections and all appurtenances to maintain the water supply to each home shall be the responsibility of the CONTRACTOR. Method of house connections shall be submitted to ENGINEER prior any watermain construction. No additional compensation will be made for connections to properties with anti-siphon units.
- E. Contractor responsible for locating all curb stop boxes that the City was unable to find, as shown on the plans and shall be considered incidental.
- F. The temporary watermain shall be in place and in working order prior to commencing with the construction of the watermain.
- G. The CONTRACTOR shall keep on site a minimum of 300 feet of 5/8" service line and 200' of 2-1/2" main line for emergency use and should be accessible for City use in case of an emergency. The City will only do emergency repairs if the

CONTRACTOR is not immediately available and will be billed accordingly by the City.

- H. It will be necessary to provide temporary watermain lines along both sides of the roadway. It may be necessary to provide temporary watermain lines to the adjacent cul-de-sac not included for reconstruction.
- I. City will establish rates and conditions.
- J. Keep water use to minimum and consistent with needs.
- K. All approved hydrant hook-ups must have a backflow preventor valve connection.
- L. Only representatives of the OWNER are permitted to operate valves and hydrants on the existing system.
- M. Water is available from the City of Plymouth at the Public Works Maintenance facility for all other uses.

END OF SECTION

SECTION 01300

APPLICATION OF WATER (MNDOT 2130)

01300.1 DESCRIPTION

This section covers supplying temporary water for dust control and new landscaping and turf.

- A. Furnishing and applying water to the roadbed for dust control purposes when specifically designated by the ENGINEER.
- B. Furnishing and applying water to the seeded and sodded areas for irrigation purposes. The Contractor is responsible for watering the turf establishment areas to assure the turf flourishes. It is the Contractor's responsibility to water the turf establishment areas more than every other day if the Contractor feels it is warranted and the ENGINEER agrees.

01300.2 REFERENCES

- A. [Section 02990](#) - Measurement and Payment

01300.3 PRODUCTS

Provide water that is clear and free of contaminants.

Water is available at the City of Plymouth Public Works located at 14900 23rd Avenue and the Zachary Water Treatment Plant, located at Zachary Lane and County Road 9. Connection to City hydrants is not allowed.

01300.4 EQUIPMENT

The contractor shall supply a self-propelled, pneumatic tired distributor vehicle. This vehicle shall have a water tank with distributing bars for roadway application. The distribution system shall be pressurized with a pumping capacity to provide uniform application at any rate up to 250 gallons per minute.

01300.5 EXECUTION

- A. Apply water in the locations and at the rates or amounts directed by the ENGINEER.
- B. Apply water within three hours of ENGINEER'S direction.
- C. Apply water for turf establishment at a minimum of every other day during specified growing days unless prior written authorization is received from the ENGINEER.
- D. The Contractor is responsible for watering the turf establishment areas to assure the turf flourishes. It is the Contractor's responsibility to water the turf establishment areas more than every other day if the Contractor feels it is warranted and the ENGINEER agrees.

END OF SECTION

SECTION 01400

EROSION CONTROL (MNDOT 1803.5)

01400.1 DESCRIPTION

This section covers the prevention and control of soil erosion and siltation.

01400.2 REFERENCES

- C. [Section 02020](#) - Excavation and Embankment.
- D. [Section 02300](#) - Storm Sewer Systems.
- E. [Section 02900](#) - Turf Establishment.
- F. [Section 02990](#) - Measurement and Payment
- G. [MNDOT 1803.5](#) - Stormwater Management and Erosion Control
- H. City Erosion control ordinance (*Ord. 2012-62, 02/28/2012*). A copy can be found in the Plymouth Engineering Guidelines, Appendix A.

01400.3 SUBMITTALS

CONTRACTOR shall provide the following for review and approval.

- B. Proposed schedule for accomplishment of work within, adjacent to, or affecting surface water.
- C. Erosion control plan and schedule.
- D. Storm Water Pollution Prevention Plan (SWPPP)
- E. Obtain all necessary permits from the Watershed Districts or responsible regulatory agencies for temporary erosion control measures not shown on the plans.

01400.4 SEQUENCING AND SCHEDULING

- A. Install erosion control measures prior to construction.
- B. Construct drainage facilities and turf establishment concurrently with earthwork operation.
- C. Complete construction and finishing operation on a drainage area basis to minimize erosion.
- D. Install erosion control measures as directed by the ENGINEER prior to the disturbance of in-place ground cover in critical areas which are tributary to public waters.

01400.5 MAINTENANCE

- A. Maintenance or replacement of inlet protection devices, including removal of built up sediment is required after 1/4" rainfall to provide proper function of the devices.
- B. Maintain all erosion control facilities to provide proper function throughout the project, and replace any which are damaged or functioning improperly.
- C. Remove temporary erosion control measures upon project completion.
- D. Contractor to provide regular inspections and documentation in SWPPP are required weekly.

01400.6 PRODUCTS

Protection for all storm sewer inlets in road or off road, shall be the responsibility of the CONTRACTOR and shall be incidental to the project unless modified by these contract documents.

- A. Silt fence material shall be in accordance with the plans.
- B. For approved products for inlet protection see "Storm Sewer Details" [ST-19](#) & [ST-20](#).

01400.7

EXECUTION

- A. Shape exposed soil areas to permit runoff with minimal erosion.
- B. Install safeguards to prevent water pollution from the work including haul roads, work platforms or other temporary construction facilities.
- C. Safeguards shall include, at a minimum, silt fence as shown in the plans and protection of all storm water inlets.
- D. Restore all plant, equipment or other supplementary operation sites to prevent siltation and erosion.
- E. Remove all temporary erosion control measures after turf is established.
- F. Follow requirements as noted in SWPPP, MPCA, and any permit from regulatory agencies listed in the "Supplementary Conditions".
- G. Repair any off-site damage resulting from failure to install or maintain erosion control measures.
- H. Stabilize exposed soil areas where construction activity has permanently or temporarily ceased on any portion of the site and will not resume for a period exceeding 14 calendar days by methods acceptable to the ENGINEER. Stabilization should begin immediately after construction activity has ceased. Stabilization should be completed in accordance with all applicable permitting or no later than 14 calendar days after activity has ceased, whichever is more restrictive.

END OF SECTION

SECTION 01500

AIR, LAND AND WATER POLLUTION (MNDOT 1717)

01500.1 DESCRIPTION

This section covers requirements for the control of pollution from construction sites and related activities.

01500.2 REFERENCES

- A. [Section 01400](#) - Erosion Control
- B. [Section 02990](#) Measurement and Payment
- C. [MNDOT 1717](#) - Air, Land, and Water Pollution

01500.3 REGULATORY REQUIREMENTS

Conduct all operations to prevent, control and abate the pollution of air, land and water in accordance with the rules, regulations and standards adopted and established by the following agencies:

- A. Minnesota Pollution Control Agency.
- B. Minnesota Department of Natural Resources.
- C. U.S. Army Corps of Engineers.
- D. Applicable watershed as listed in the "Special Provisions".

01500.4 SCHEDULING

Schedule and conduct all operations to minimize soil erosion and prevent siltation and the resultant turbidity of public waters.

01500.5 EXECUTION

- A. Review all local conditions and regulations pertaining to air and land pollution prior to commencing operations.
- B. Prevent pollution of flowing or impounded waters from particulate or liquid matter that may be harmful to fish and wildlife or detrimental to public use.
- C. Remove sediment from aggregate wash operations by filtration or settlement prior to discharge into public waters.
- D. Wash water or waste from concrete mixing operations shall be discharged at a location shown on plans, or approved by ENGINEER.
- E. Fueling operations shall be conducted in a manner to not cause any pollution.

END OF SECTION

SECTION 01600

TRAFFIC CONTROL AND DETOURS

01600.1 DESCRIPTION

This section covers procedures and equipment for safely maintaining and controlling traffic within the project site during construction.

01600.2 REFERENCES

- A. [Section 02990](#) - Measurement and Payment
- B. [MNDOT 1404](#) - Maintenance of Traffic.
- C. [MNDOT 1710](#) - Traffic Control Devices.
- D. Minnesota Manual on Uniform Traffic Control Devices ([MMUTCD](#)).
- E. [MMUTCD](#), Temporary traffic control zone layouts (Field Manual), Current Addition.
- F. AASHTO - [Guide for Selecting Locations and Designing Traffic Barriers](#).
- G. MNDOT - [Standard Signs Manual](#).
- H. MNDOT - [Standard Plate No. 8000](#) - Standard Barricades.
- I. MNDOT - [Standard Plate No. 8337](#) - Temporary Portable Precast Concrete Barrier.
- J. MNDOT - [Traffic Engineering Manual](#)

01600.3 DEFINITIONS

- A. Long Term Restriction - A traffic restriction or lane closure which is in effect during construction without regard to the time restrictions stated in 1600.7B.
- B. Short Term Restriction - A traffic restriction or lane closure which is in effect only during the CONTRACTOR'S work hours and is consistent with the time restrictions stated in 1600.7B.

01600.4 SUBMITTALS

A Traffic Control Plan as detailed in 1600.7C, shall be submitted at the pre-construction conference.

01600.5 QUALITY ASSURANCE

Conduct all operations in accordance with the ([MN MUTCD](#)), "[Temporary Traffic Control Zone Layouts Field Manual](#)". All traffic control devices must conform to the MN MUTCD manual.

- A. Provide qualified, certified flaggers that are familiar with applicable traffic laws and regulations and have been properly trained in the responsibilities of traffic control, including provisions spelled out in the Traffic Control Manual (Flagging Handbook).
- B. Provide properly deputized flaggers to direct and control traffic around or through a traffic control device.
- C. Flaggers shall be properly clothed and equipped, including shirt or blouse, slacks or trousers, sturdy shoes, fluorescent orange hard hat, fluorescent orange vest (reflectorized at night) and an approved "Stop-Slow" paddle or standard. All clothing shall be in accordance with current Minnesota OSHA rules.
- D. Uniformed off-duty police/patrol officers using hand signals may be used in lieu of flaggers with hard hat, vest and "Stop-Slow" paddle. However, they shall also be equipped with a fluorescent orange vest and hard hat during flagging operations.

01600.6

SITE CONDITIONS

Parking of CONTRACTOR/Worker Vehicles

- A. Do not park vehicles in a manner or location which:
- Interferes with traffic flow.
 - Conflicts with resident or consumer parking.
 - Obstructs any traffic control device.

01600.7

SEQUENCING AND SCHEDULING

- A. Closure and Detour Requests:
- Submit request for short term lane closure to the ENGINEER at least 24 hours prior to time of closure.
 - Submit request to close street and divert traffic to the ENGINEER for review at least 3 working days prior to time of closure.
 - Provide notice for all closures and detours.
- B. Restrictions:
1. Working hours, including materials and equipment delivery, shall be restricted to:
 - Monday thru Friday: 7:00 a.m. - sunset.
 - Saturday: 8:00 a.m. - 6:00 p.m.
 - Sundays and Holidays: No work allowed.
 2. Work which interferes with traffic operations, shall not be performed during the following times
 - From 7:00 a.m. to 9:00 a.m. - Monday thru Friday inclusive.
 - From 3:00 p.m. to 6:00 p.m. - Monday thru Friday inclusive.
 - From 12:00 noon on the day before to 9:00 a.m. the day following any consecutive combinations of Saturday, Sunday and legal holiday.
 - The ENGINEER will have the right to lengthen, shorten, or otherwise modify the foregoing periods of restrictions as actual traffic conditions may warrant.
 3. Lane closures will not be permitted during inclement weather or when the ENGINEER determines that such closure will be a hazard to traffic.
 4. Any street requiring reconstruction or utility installation shall not be closed to traffic unless approved by ENGINEER and is subject to the following restrictions and provided proper signs and barricades are erected.
 5. All streets requiring reconstruction shall be fully backfilled with sand and partially surfaced with aggregate base at the **end of each day**. Two way traffic with an aggregate or bituminous surface will be provided for all streets at the end of each day following reconstruction and utility work. Conduct operations to allow continual fire and police access to all areas within the project. CONTRACTOR shall schedule work accordingly.
 6. Access to all driveways shall be provided at the **end of each day**.
 7. Construction Operations shall be coordinated, by the CONTRACTOR, to afford local residents access to the vicinity of their homes, consistent with other portions of these Special Provisions.
 8. Do not close or restrict traffic on two adjacent parallel streets or unconnected sections of the same street if other access is not available at the same time, in order to permit residences or businesses to have reasonable access and parking during the course of construction.
 9. Provide for protection of pedestrians and traffic from open excavations.
 10. The above restrictions may be modified as necessary to insure safe traffic operations.
- C. Traffic Control Plan:

1. Submit a detailed written traffic control plan for approval prior to the date of the preconstruction meeting as directed by the Engineer.
2. Information to be included in the plan:
 - Planned sequence of construction operations.
 - Proposed Street and lane closures or restrictions and estimated dates.
 - Provisions for routing detoured traffic.
 - Signs and devices to be used.
 - Anticipated traffic control sign locations.
 - Sketches as necessary to illustrate traffic control procedures.
3. The traffic control plan shall reflect the restrictions detailed in Paragraphs A and B.
4. The traffic control plan is subject to acceptance, rejection or suggested revision by the ENGINEER.
5. No construction operations may begin without the approval of the plan.
6. All revisions to the traffic control plan are subject to the approval of the ENGINEER.

01600.8 MAINTENANCE

- A. Responsibility:
 1. Maintain all traffic control devices throughout the term of the contract, including work suspensions.
 2. Repair or replace as necessary
 - Devices that are damaged or moved.
 - Lights that cease to function properly.
 - Barricade weights that are damaged or fail to stabilize the barricade.
 - All traffic control devices shall be removed or covered when not required for work in progress.
- B. Inspection:
 1. Check all devices twice daily, including once at the end of the work day.
 2. Conduct one night (after work hours) inspection of all devices per week.
 3. Immediately correct all deficiencies in alignment, visibility and reflectivity.
 4. Maintain log of inspections and major corrective actions. This log shall be made available to the ENGINEER upon request.
- C. Notice:
 1. Furnish names, addresses, and phone numbers of two local persons who will respond to requests for maintenance to the following:
 - The ENGINEER.
 - Plymouth Police Department.
 - Plymouth Fire Department.
 2. Provide a means of receiving maintenance requests on a 24 hour basis.
 3. Respond to all maintenance requests within 2 hours.
- D. Failure to respond to maintenance requests will result in the work being completed by the OWNER with twice the cost thereof being deducted from any moneys due the CONTRACTOR.

01600.9 EQUIPMENT

- A. Signs:
 1. Provide all required signs in accordance with the MMUTCD, MNDOT Standard Signs Manual, MnDOT Traffic Engineering Manual, the Field Manual, the Plans, and as approved by the ENGINEER.
 2. All signs shall be fabricated of either steel or aluminum.
 3. Provide the following signs as necessary:
 - 36" x 36" Road Construction Ahead (W20-I).

- 48" x 30" Road Closed (RII-2).
 - 60" x 30" Road Closed Local Traffic Only.
 - 36" x 36" Road Closed Ahead (W20-3).
4. Provide other signs including all detour and detour warning signs as necessary to comply with MMUTCD, and the Field Manual.
 5. Barricades:
 - Provide 8', Type III barricades in accordance with the current MNDOT Standard Plate 8000.
 - Mark all hazards with, at a minimum, a Type I barricade.
 - Provide flashers on all barricades.
 6. Traffic Cones:
 - Cones are to be used only at attended work areas.
 - No cones shall be left unattended.
 - All cones shall be reflectorized.
 7. Ballast:
 - Sandbags will be the only acceptable weight to stabilize traffic control devices.

01610.0

EXECUTION

- A. Advance Notice:
 1. Provide minimum 48 hour notice for all closures and detours to the following:
 - The ENGINEER.
 - Plymouth Police Department.
 - Plymouth Fire Department
 2. Provide minimum 48 hour notice for all closures and detours to all affected residences and businesses.
 3. Post signs informing the traveling public of all closures and detours a minimum of 72 hours prior to closure.
 4. Provide 24 hours' notice to residents and the Engineer whenever access to a driveway will be limited.
- B. In place Facilities:
 1. Signs:
 - a. Do not remove signs unless authorized by the ENGINEER.
 - b. Carefully remove and store designated signs and posts for reinstallation.
 - c. Replace signs and posts damaged during removal, storage, or reinstallation.
 - d. Carefully remove and deliver signs and posts to the City as directed by the ENGINEER.
 - e. Provide flaggers as directed when "STOP" or other prohibition signs are removed.
 - f. Relocate or temporarily mount all required signs along streets which remain open to traffic.
 - g. Reinstall all signs not being replaced in accordance with the MMUTCD, and the MnDOT Traffic Engineering Manual.
 - h. Protect underground utilities during sign relocation.
 2. Mail Boxes:
 - a. Prior to construction, relocate any mail and other delivery boxes, within the construction area, to a location which will allow delivery during construction.
 - b. Coordinate with U.S. Postal Service and other affected delivery services to determine proper location.

- c. Following construction, reinstall all mail and other delivery boxes in convenient locations and in compliance with USPS regulations. Reinstallation shall be to the pre project condition or better.
 - d. Protect underground utilities during mailbox relocation.
 - e. Replace any box or supporting member that is damaged during construction.
- C. Installation of Devices:
- 1. Provide, locate and maintain all traffic control devices in accordance with the contract documents and the approved traffic control plan.
 - 2. Provide minor modifications and field adjustments as directed at no additional cost to accommodate special conditions or situations which may occur.
- D. Traffic Protection:
- 1. Do not deposit or store materials (e. g. dirt, aggregate, manhole castings, etc.) or park equipment on or adjacent to any roadway open to traffic that will interfere with the safe flow of traffic.
 - 2. Provide traffic barriers for any obstruction placed within the "clear zone" as defined by the AASHTO Guide for Selecting Locations and Designing Traffic Barriers.
 - 3. Keep roadways which are open to traffic free from earth materials and debris. This will include sweeping the street on a daily basis or as determined by the ENGINEER.
 - 4. During construction, provide devices to protect traffic and pedestrians from drop-offs, openings, falling objects, splatter or other hazards.
- E. Flaggers:
- 1. Provide flaggers where necessary to control traffic and to guide traffic through the construction area.
- F. Open Excavations Adjacent to the Traveled Roadway:
- 1. When excavations exceed 2" in depth:
 - Place warning lights on a Type I barricade or drum at not greater than 50' intervals.
 - Provide barricades with warning signs and lights at each location or at intervals not more than 1/4 mile.
 - Signs shall indicate "NO SHOULDER", "LOW SHOULDER" or "SOFT SHOULDER" as required.
 - Open excavations adjacent to the driving lane in excess of 10 inches in depth shall at no time exceed an aggregate length of 500 feet.
- G. Resident Parking:
- 1. Provide parking in front of each residence with driveway access disrupted overnight.
 - 2. Provide adequate parking as close as practical and not more than 500 feet from the disrupted driveway access.
- H. Pedestrian Access and Traffic:
- 1. Provide continuous access to all adjacent residences and businesses.
 - 2. Provide signs, barricades, flashers, snow fence or other devices as required to protect pedestrians adjacent to the work.
- I. Field Quality Control
- 1. Prior to construction and upon request, present all traffic control devices intended for use on the project to the ENGINEER to insure conformance with the MMUTCD.
 - 2. Replace any device which is found to be defective.

END OF SECTION

SECTION 01700

APPLICATION OF CALCIUM CHLORIDE (MNDOT 2131)

01700.1 DESCRIPTION

This section covers the application of calcium chloride as a roadbed surface treatment for the control of dust.

01700.2 REFERENCES

- A. Related Sections And References
 1. [Section 02400](#)-Subgrade Preparation
 2. [Section 02400](#)-Aggregate Base
 3. [Section 02400](#)-Aggregate Surfacing
 4. [Section 02990](#)-Measurement And Payment
 5. [MnDOT 2131](#)-Applications of Calcium Chloride
 6. [MnDOT 3911](#)-Calcium Chloride

01700.3 PRODUCTS

- A. Materials
 1. Calcium Chloride shall be in accordance with [MnDOT 3911](#).
 2. Water shall be clear and free of contaminants.
- B. Equipment
 1. Distributor for calcium chloride solutions shall be in accordance with [MNDOT 2360.3B.2.d](#).

01700.4 SURFACE APPLICAION

- A. Methods of Application:
 1. Apply in solution form with a distributor.
 2. Apply uniformly in the locations as directed by the ENGINEER and at the rate of 0.20 gallons / square yard.

END OF SECTION

SECTION 01800

CONTRACTOR'S SIGNS

01800.1 DESCRIPTION

Provide the number of signs called for by the plans or ENGINEER in accordance with City Detail DWG-1 found in the current City of Plymouth Engineering Guidelines, including the following:

- Contractor's Name
- Business Address
- Business Phone Number
- City Project Information
- Free Standing
- Wind Resistant
- Minimum 4' high by 6' wide
- Use black lettering on a white background

01800.2 REFERENCES

- A. [Section 02990](#) - Measurement and Payment

01800.3 MATERIALS

- A. Wood or metal intended for weather exposure

01800.4 INSTALLATION

- A. Install at project entrance locations as designated by the ENGINEER
B. Install prior to start of construction
C. Protect existing in place utilities during installation
D. Remove upon completion of project

END OF SECTION

SECTION 01900

MAINTENANCE AND FINAL CLEAN UP

01900.1 DESCRIPTION

- A. The CONTRACTOR is responsible for protecting existing trees, sprinkler systems and other improvements. Any tree roots damaged shall be neatly cut perpendicular to the root.
- B. The CONTRACTOR shall report to the ENGINEER in writing any undesirable conditions, such as silt or sand in manholes and valve boxes, damaged castings and valve boxes, etc., prior to commencing work on any street. Once work has commenced it will be assumed that all damage to underground installations except that reported above, has been caused by the CONTRACTOR'S operations and it will be the CONTRACTOR'S responsibility to make necessary repairs.
- C. All underground utilities including manholes and valve boxes shall be maintained in a condition that allows access in case emergency use is required.
- D. Underground utilities shall be maintained in an operable condition. All debris or sediment shall be removed immediately.
- E. Contractor shall televise all sanitary sewer and new storm sewer pipes when directed by the ENGINEER. Televising shall be completed per the City of Plymouth specifications, 02105.2 & 02305.3, Televising of Lines.
- F. All debris, waste materials or other remains from construction shall be removed from the site and properly disposed of before final acceptance of work.
- G. Each Contract item will not be finally accepted until its associated clean-up is performed.
- H. Until each item's clean-up is completed, the OWNER may withhold partial payments or deduct the estimated clean-up cost from the partial payment value.
- I. The CONTRACTOR is responsible for keeping streets and roadways clean of dust, dirt, mud and debris both inside and outside the work area.
 - 1. This may require measures to clean trucks before leaving the site and sweeping paved areas.
 - 2. Roadways shall be cleaned by a pickup sweeper within 24 hours of direction by the ENGINEER.
- J. The Contractor's staging, storage, and equipment parking areas shall be sodded before final acceptance of the work.
- K. Contractor shall clean all debris and sediment from all manholes prior to final acceptance.

01900.2 REFERENCES

- A. [Section 02990](#) - Measurement and Payment

END OF SECTION

SECTION 02000

REMOVING PAVEMENT AND MISCELLANEOUS STRUCTURES (MNDOT 2104)

02000.1 DESCRIPTOIN

This section includes the removal and disposal of the following:

- Pavements.
- Sewers and appurtenances.
- Concrete curb and gutter.
- Watermain and appurtenances.
- Salvaging of designated materials.
- Backfilling of resulting depressions.

02000.2 REFERENCES

- A. [Section 02020](#) - Excavation and Embankment.
- B. [MNDOT 2104](#) - Removing Pavement and Miscellaneous Structures.
- C. [Section 02990](#) Measurement and Payment.

02000.3 PREPARATION

- A. Sawing Pavement:
 1. Saw concrete pavement along removal lines to a depth at least 1/3 of the pavement thickness.
 2. Saw concrete curb at least 1/2 curb thickness unless removing at joint.
 3. Saw bituminous pavement along removal lines through entire pavement thickness.
 4. Produce a neat, square edge prior to restoration.
- B. Protect all in place structures and facilities not designated for removal.

02000.4 REMOVAL OPERATIONS

- A. Remove only structures and facilities that have been so marked by the ENGINEER.
- B. Complete all removal operations prior to adjacent new construction.
- C. Remove materials designated for salvage in a manner that will not result in damage.
- D. Completely remove structures and facilities which are designated for removal.
- E. Whenever possible, remove concrete to an existing joint unless otherwise directed by the ENGINEER.

02000.5 DISPOSAL OF MATERIALS AND DEBRIS

- A. Stockpile all materials designated for salvage at locations approved by the ENGINEER.
- B. Dispose of all materials not designated for salvage in accordance with all applicable laws and ordinances.

02000.6 BACKFILLING DEPRESSIONS

- A. Backfill all depressions resulting from removals in accordance with [Section 02020](#).

02000.7 SALVAGE OF MATERIALS

- A. General
 1. Carefully remove material to avoid damage.
 2. Provide installation of equal or better quality than the existing.
 3. Protect salvaged materials from damage until reinstalled.

- B. Mail Boxes:
 - 1. Prior to construction, install temporary mailboxes within the construction area, to a location allowing delivery during construction.
 - 2. Coordinate with U.S. Postal Service and other affected delivery services to determine proper location.
 - 3. Following construction, reinstall all mail and other delivery boxes in convenient locations and in compliance with USPS regulations. Reinstallation shall be to the pre-project condition or better.
 - 4. Protect underground utilities during mailbox relocation.
 - 5. Replace any box or supporting member that is damaged during construction.
 - 6. Any mailbox that is removed shall be located at a location approved by ENGINEER.
- C. Invisible Dog Fence
 - 1. Salvage and install invisible dog fences to match in with the new yard grades.
 - 2. Protection of invisible dog fences throughout the project is the responsibility of the CONTRACTOR. No compensation will be provided for damaged invisible dog fences except as noted above.

02000.8 MILL BITUMINOUS SURFACE

Mill bituminous pavement either the entire width of the roadway between the concrete gutters (full width) or a designated width out from the curb (edge mill) at the depth specified in the bid tab or special provision.

END OF SECTION

SECTION 02010
CLEARING AND GRUBBING
(MNDOT 2101)

02010.1 DESCRIPTION

This section covers the removal and disposal of trees, shrubs, brush, stumps, roots, windfalls, unsound branches and other plant life.

02010.2 REFERENCES

- A. [Section 01900](#) - Maintenance and Final Cleanup
- B. [Section 02990](#) - Measurement and Payment
- C. [MnDOT 2101](#) - Clearing and Grubbing

02010.3 PROTECTION

- A. Confine operations to the areas staked or trees marked for removal.
- B. Protect all trees and plant materials, including root zones, which are not designated for removal.
- C. Conduct all operations in a manner that will not damage or injure surrounding plant life and property.
- D. Install orange construction fence as directed by the ENGINEER to prevent construction activity within the dripline of trees 8" or larger adjacent to the work area.
- E. Cut any roots damaged neatly perpendicular to the root at a minimum of 1 foot away from the roadway section.

02010.4 CLEARING OPERATIONS

- A. Cut and remove all designated trees, shrubs, bushes, windfalls and other vegetation.
- B. Prune and remove any low hanging or unsound branches as directed on trees and shrubs designated to remain.

02010.5 GRUBBING OPERATIONS

- A. Remove and dispose of designated stumps, roots and other remains.
- B. Remove stumps completely.
- C. Backfill depressions with native soils and compact.

2010.6 DISPOSAL OPERATIONS

- A. The CONTRACTOR is responsible for disposal of all trees, brush, stumps, roots, and other debris.
- B. Dispose of debris from Elm and Red Oak in accordance with state and local ordinances.

END OF SECTION

SECTION 02020

EXCAVATION AND EMBANKMENT (MNDOT 2105)

02020.1 DESCRIPTION

This section covers the construction of roadway excavations and embankments within the designated construction limits.

02020.2 RELATED REFERENCES AND SECTIONS:

- A. [Section 02300](#) – Storm Sewer (Subsurface Drains).
- B. [Section 02400](#) – Street Construction (Test Rolling).
- C. [Section 02990](#) – Measurement and Payment
- D. [MNDOT 2105](#) – Excavation and Embankment
- E. [MNDOT 3149](#) – Granular Material
- F. [MNDOT 3733](#) - Geotextile

02020.3 DEFINITIONS

- A. Common Excavation:
 - 1. All excavation from existing elevations to the bottom of the typical section.
 - 2. Includes removal of existing bituminous curb and pavement in reconstructed areas regardless of pavement depth.
 - 3. Includes on-site embankment construction with suitable excavated materials.
- B. Subgrade Excavation
 - 1. All excavation within the roadway below the typical section to remove unsuitable materials.
 - 2. The CONTRACTOR is responsible for disposal of all subgrade excavation material outside the project limits.
- C. Select Granular Borrow:
 - 1. Shall conform to [MNDOT 3149](#) except that crushed concrete will not be allowed.
 - 2. Material larger than 4 inches shall be considered oversized and be promptly removed by the CONTRACTOR.
- D. Channel Excavation:
 - 1. Shall consist of ditch and channel excavation to remove sediment and/or provide positive drainage as directed by the ENGINEER.
 - 2. The CONTRACTOR shall be responsible for disposal of all excavated material outside of project limits.
- E. Pond Excavation:
 - 1. All excavation of pond material to the elevations shown on the plans.
 - 2. The contractor shall be responsible for disposal of all excavated material outside of project limits.
 - 3. Includes on site embankment construction with suitable excavated material.

02020.4 GENERAL REQUIREMENTS

- A. If present, remove ice and snow prior to grading operations.
- B. All grading shall conform to the planned grades, cross-sections, and stakes.
- C. Confine operations to established limits.
- D. Due to lack of records and extensive maintenance activity, pavement depths will vary widely throughout the project area.

- E. Maintain site in a well-drained condition at all times:
 - 1. Install planned drainage facilities concurrent with embankment operations.
 - 2. Provide temporary drainage facilities to maintain existing drainage courses until permanent facilities are operative.

02020.5 PREPARATION OF EMBANKMENT FOUNDATION

Remove topsoil, organic and unstable material from the roadbed prior to placing embankment.

02020.6 EXCAVATING OPERATIONS

- A. Conform to lines, grades and slopes staked by the ENGINEER.
- B. Excavate unsuitable subgrade material as directed by the ENGINEER.
- C. Provide seepage trenches for granular backfill replacement of unstable areas.

02020.7 DISPOSAL OF EXCAVATED MATERIAL

- A. Use suitable excavated materials for embankment construction.
- B. Construct embankment layers from uniform materials.
- C. Place granular materials in upper most portion of the embankment.
- D. Mechanically mix non-uniform soils to produce uniform moisture content and density.
- E. Excavate all suitable topsoil material separately and stockpile.
- F. Do not place snow, ice or frozen lumps exceeding 6" in the roadbed embankment.
- G. Do not place stone, concrete or bituminous fragments exceeding 3" in the upper 6" of roadbed embankment or within 18" of any structure.
- H. All surplus excavated materials not used in embankments shall become the property of the CONTRACTOR for disposal without exception.

02020.8 GEOTEXTILE FABRIC

- A. Use the type of woven geotextile fabric as specified in the contract documents or directed by the ENGINEER.
- B. Place below granular materials in areas designated by the ENGINEER.
- C. Splice multiple fabrics widths by mechanical splicing or by minimum 18" overlap.
- D. Anchor fabric to prevent movement during backfilling.
- E. Do not operate equipment directly on fabric.

02020.9 PLACING EMBANKMENTS

- A. Do not place material on soil which is frozen to a depth greater than 4".
- B. Backfill excavations below subgrade and seepage trenches in accordance with this section.
- C. Deposit and spread material in uniform layers parallel to the profile grade extending over the full width of the embankment.
- D. Place upper 3' of roadbed in maximum 8" layers.
- E. Place remainder of roadbed in maximum 12" layers.
- F. Fully compact each layer.
- G. Fully backfill all excavations with granular borrow at the end of each day.
- H. Partially surface all granular backfill with aggregate base at the end of each day.
- I. Placement of stockpiled granular material shall be as shown in the plans or directed by the engineer, but in no case closer than 6-feet from any drain tile unless it is at least 2 feet vertically below the drain tile.

02020.10 COMPACTING EMBANKMENTS

- A. Compact upper 3' of embankment to not less than 100% of Standard Proctor Density.

- B. Compact remainder of embankment to not less than 95% of Standard Proctor Density.
- C. Maintain proper moisture content during placement and compaction.

02020.11 FIELD QUALITY CONTROL

- A. Density tests on backfill materials will be as directed by the ENGINEER.
- B. CONTRACTOR to re-compact all areas represented by failed density tests with no additional compensation from the OWNER.
- C. OWNER will provide for initial test and first retest.
- D. Costs of subsequent retests to be deducted from CONTRACTOR'S payment.

02020.12 FINISHING OPERATIONS

- A. Finish all earth work to within 0.1' of the staked grade.
- B. Conduct finishing and top soiling concurrent with the grading operations to provide for erosion control.

END OF SECTION



**STANDARD SPECIFICATIONS
FOR
SANITARY SEWER CONSTRUCTION
CITY OF PLYMOUTH, MINNESOTA**

JANUARY 2018

ENGINEERING DIVISION

3400 PLYMOUTH BLVD.
PLYMOUTH, MN USA 55447-1482
TELEPHONE (763) 509-5500

A handwritten signature in black ink, appearing to read 'Jim Renneberg', is centered below the contact information.

Jim Renneberg, P.E.
City Engineer

These specifications are intended for inclusion into the contract documents. They only address the technical specifications and construction details of the referenced section.

**SECTION 02100
STANDARD DETAIL SPECIFICATIONS
FOR
SANITARY SEWER CONSTRUCTION
CITY OF PLYMOUTH, MINNESOTA USA**

JANUARY 2018

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Print on Green Paper

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02101 SCOPE OF WORK

The work to be done under this contract shall include the furnishing of all labor, materials, tools and equipment to construct complete in place the sanitary sewer and all appurtenances as shown on the drawings, plans and as specified herein.

When installing public utilities in a new residential development all builder and developer construction activity shall pause until the public utilities have been installed, tested and the streets built.

The Contractor shall excavate all materials encountered, furnish and compact foundations where required, furnish and install all timbering, sheeting and bracing necessary to safely support the work, remove any ground water encountered during excavation operations, protect, repair, relocate, maintain and restore all sub-surface, surface and overhead structures directly disturbed, damaged or affected by construction operations and furnish all backfill and other appurtenant items and services as necessary. All site grading must be completed, certified by the project Engineer and all "Off Road" grading equipment removed from the site before starting any public utility work.

All off road sanitary sewer manholes must be accessible to the city's maintenance vehicles. (See Detail [SS-9](#)) A 12' wide bituminous access road with a turnaround shall be constructed to each structure. All off road manholes shall be marked with a flange post and a green reflectorized metal marker plate with white "M.H." lettering printed upon the plate. The marker plate shall face the closest access road. The flange post shall be located approximately 2' behind the manhole when facing the roadway. Costs to construct access roads shall be incidental to the sanitary sewer installation unless otherwise modified by the contract documents. If service disruption to an existing sewer line is anticipated then written notice shall be delivered to each home or business 48 hours prior to the disruption describing work, schedule, how it affects them, and a local telephone number of the Contractor they can call to discuss the project or any problems which could arise.

Records of sewer services installed shall be gathered by the contractor as the work progresses. Those records shall be turned over to the engineer upon completion of the work. The records will include the type of service connection, distance installed from the downstream manhole, and the length of any riser installed.

02102 SPECIFICATIONS WHICH APPLY

All specifications contained herein, including attached detail drawings, together with the construction plans for the designated project or projects and including current versions of those portions of the following specification, as indicated by paragraph or designation number, shall apply unless modified within these specifications: American Society for Testing Materials ([ASTM](#)); American National Standards Institute ([ANSI](#)); American Water Works Association ([AWWA](#)); Minnesota Department of Transportation "Standard Specifications for Construction" current addition including Special Provisions ([MnDOT](#)); and The "City Engineers Association of Minnesota", Standard Specifications for Utility Construction [CEAM](#) current edition.

02103 SANITARY SEWER MATERIALS

All sanitary sewer pipe, fittings, manholes and appurtenances shall be new materials and shall be of the type, size, strength, and quality as shown on the plans and as specified herein and/or as indicated in the Special Provisions.

The contractor may be required to secure and deliver to the City Engineer or a designee, a written statement from the manufacturer assuring the quality and compliance to the applicable specification of all materials furnished and installed under this improvement

project. This shall in no way relieve the Contractor of any responsibility as to the quality of materials furnished and installed.

02103.1 PIPE BEDDING MATERIAL –Sanitary Sewer Materials

Pipe bedding material shall be in accordance with standard detail plate [SS-6](#) (sanitary sewer bedding), utilizing sand conforming to MnDOT specification [3149.2B2](#). The contractor shall provide Certification of the materials being used and will be required to perform field sampling for gradation test of any bedding materials used as required by the City Engineer. Copies of test results shall be submitted to the City in a timely manner. Bedding shall be considered incidental to the pipe installation unless noted otherwise in the contract documents.

02103.2 POLY VINYL CHLORIDE PIPE –Sanitary Sewer Materials

Poly Vinyl Chloride pipe (PVC) shall be used for gravity sanitary sewer 8" through 12" diameter with a maximum cover of 26' and shall conform to the requirements of ASTM D-3034 and ASTM F-679 for the size, standard dimension ratio (SDR), and strength requirements indicated on the Plans, Specifications, and Special Provisions. The grade used shall be resistant to aggressive soils or corrosive substances in accordance with the requirements of ASTM D-543 and be **green in color**. Pipe shall be new, manufactured within the past 12 months as determined from the date stamp on the pipe and free of defects. Pipe will be rejected if surface chalking from UV exposure is visible.

For main line sanitary sewer pipe and services 8" diameter and larger, SDR35 pipe shall be used for depths to 15 feet, and SDR26 pipe shall be used for depths from 15 feet to 26 feet. Ductile iron pipe shall be used when maximum cover is over 26 feet. Pipe material for 4" & 6" diameter services shall be either schedule 40 PVC for up to 26' deep or D.I.P if main line is 26' deep or more.

02103.3 POLYETHYLENE (PE) PRESSURE PIPE AND FITTINGS – Sanitary Sewer Materials

Polyethylene pressure pipe and fittings shall conform to the requirements of AWWA C906 for the size and pressure class indicated on the Plans, Specifications and Special Provisions. Unless otherwise specified, the dimensions and tolerances of the pipe barrel should conform to Ductile Iron pipe equivalent outside diameters. The method of joining material shall be by the Thermal Butt- Fusion Method.

The HDPE fittings shall be standard commercial products manufactured by injection molding or by extrusion and machining, or, shall be fabricated from PE pipe conforming to this specification. The fittings shall be fully pressure rated by the manufacturer to provide a working pressure equal to the pipe, for 50 years' service at 73.4 degrees Fahrenheit with an included 2:1 safety factor. The fittings shall be manufactured from the same resin type, grade, and cell classification as the pipe itself. The manufacture of the fittings shall be in accordance with good commercial practice to provide fittings homogeneous throughout and free from crack, holes, foreign inclusions, voids, or other injurious defects. The fittings shall be as uniform as commercially practicable in color, opacity, density and other physical properties. The minimum "quick-burst" strength of the fittings shall not be less than that of the pipe with which the fitting is to be used.

02103.4 DUCTILE IRON PIPE –Sanitary Sewer Materials

Ductile iron pipe and fittings used in sanitary sewer construction for depths of 26 feet or more shall conform to the applicable dimensions and tolerances of ANSI Spec. A21.50 and A21.51. (Unless otherwise specified, ductile iron pipe shall conform to ANSI A21.51 standard thickness class 53.)

Every pipe and fitting shall be tar coated on the outside and shall be cement lined on the inside. Cement mortar lining shall be in accordance with ANSI, Specification A21.4. An approved water stop gasket shall be used at manhole connections as directed by the City Engineer or a designee. All DIP shall be polyethylene wrapped in conformance with ANSI/AWWA C105 A21.5. All underground installed bolts, T-bolts, nuts and any rodding required shall be stainless steel, ASTM F 593 Type 304 for all fittings.

Ductile iron pipe shall be grade 60-42-10 with 40/90 metal strength and shall be tested in accordance with ASTM Spec. A339. Fittings for ductile iron pipe shall conform to ANSI A 21.10. 12" and smaller shall be class 250; 16" and larger, class 150.

02103.5 SANITARY SEWER SERVICE PIPE AND CONNECTIONS –

Sanitary Sewer Materials

Sanitary sewer service pipe and connections shall be 4" Schedule 40 P.V.C. or D.I.P. depending upon the depth of the service pipe (see section [02103.2](#) for depth zones). When connecting a new sanitary sewer service to an existing sanitary main the contractor shall use a "QwikSeal" connector manufactured by "Fernco, Inc." or approved equal. The connector used will depend upon the size of the main line and the depth of the service. Each will be installed with green color coated, insulated, #10 solid copper core tracer wire rated for underground service. If replacing an existing sewer service, then removal of the old service back to the main may be required. See the special provisions or the plans for direction. See Standard Detail Plates [SS-1](#) & [SS-2](#).

02103.6 MANHOLES –Sanitary Sewer Materials

Manholes and other special access structures shall be constructed at designated locations as required by the Plans and in accordance with any standard detail drawings or special design requirements given therefore. Barrel and cone height shall be such as to provide a minimum adjustment of 4" using 2" rings and maximum adjustment of 12" with a 6" thick ring used for adjustments of 8" or greater with two 2" rings immediately below the casting assembly. Every pipe penetration through the manhole wall shall have a rubber boot and stainless steel clamp to seal the pipe penetration from infiltration of ground water. Any field added opening for pipe shall be core drilled. Manholes shall be in manufactured accordance with MnDOT Specification [3622](#), and have a minimum diameter of 4'. See Standard Detail Plate [SS-3](#).

02103.7 MANHOLE OUTSIDE DROP STRUCTURES –Sanitary Sewer Materials

Manhole drop structures shall be constructed as shown on City of Plymouth Standard Details [SS-4](#) & [SS-5](#). No inside drops allowed.

02103.8 MANHOLE CASTINGS –Sanitary Sewer Materials

Manhole castings shall be Neenah No. 1642, 1755 for watertight applications or approved equal with machine bearing surfaces, with two concealed pick holes and "Sanitary Sewer" stamped on the cover, unless noted otherwise. See Standard Detail Plate [SS-3](#).

02103.9 MANHOLE ADJUSTING RINGS –Sanitary Sewer Materials

Manhole adjusting rings shall be High Density Polyethylene (HDPE). The rings shall provide a minimum adjustment of 4" using 2" rings and maximum adjustment of 12" with a 6" or 4" thick ring used for adjustments of 8" or greater. Joints between structure, rings and casting shall be sealed with a Butyl caulk. Solid

reinforced concrete adjusting rings may be used in special situations only with **prior** written approval by the City Engineer. See Standard Detail Plate [SS-3](#).

02103.10 MORTAR –Sanitary Sewer Materials

Mortar for use in masonry construction shall be an air-entrained mixture of one part Masonry cement, Type M, and two parts mortar sand, with sufficient water to produce proper consistency, and with sufficient air-entraining agent added to maintain an air content within the range of 7 to 10 percent. Mortar shall meet the requirements of ASTM C-270.

02103.11 EXTERNAL UNI-BAND SEAL –Sanitary Sewer Materials

Each manhole joint shall be sealed with an external rubber sleeve similar to the Sealing Systems Inc. [Infi-Shield Gator Wrap](#) as manufactured by Sealing System, Inc. or approved equal. The seal shall be made of a 6" wide, stretchable, self-Shrinking, intra-curing halogenated base rubber with a minimum thickness of 30 mils. The back side of each unit shall be coated with a cross-linked reinforced butyl adhesive. The butyl adhesive shall be non-hardening sealant with a minimum thickness of 30 mils. The seal shall be designed to stretch around the joint and then overlap creating a cross-link and fused bond between the rubber and butyl adhesive. See Standard Detail Plate [SS-3](#).

02103.12 I/I BARRIERS –Sanitary Sewer Materials

[Striker Products I/I](#) barriers or Ess Brothers "27Sx18 Alignment Barrier" shall be used on all new and existing sanitary sewer manholes. The I/I Barriers shall be a medium density polyethylene as defined by ASTM designation D 1248. [Adaptor Inc.](#) or "[E3 Chimney Seal](#)" or approved equal can be used when reconstructing existing manholes with engineer's approval. See Standard Detail Plate [SS-3](#).

02103.13 PIPE SLEEVES –Sanitary Sewer Materials

When 4" through 12" diameter sewer line work requires a sleeve be installed the contractor shall use a "[Shear Guard](#)" coupling by Onset or approved equal. This shall be in lieu of using a "Fernco" adaptor.

02103.14 CHANNEL POSTS & MARKERS -Sanitary Sewer Materials

U-Channel post used for structure marking shall be green, 6ft in length weighting 3lb/ft. and punched full length with 3/8" diameter holes 1" on center. Marker signs shall be 0.063" thick aluminum blanks measuring 3" wide by 8" high with a high intensity green reflectorized background with white 2" high letters. Markers shall be attached to the post with two stainless steel bolts and nuts. Posts and markers shall be considered incidental unless otherwise noted.

02104 SANITARY SEWER INSTALLATION

02104.1 WORKING HOURS –Sanitary Sewer Installation

The City Engineer or a designee shall be notified at least 48 hours prior to commencing any work. Phone # (763) 509-5500. Contractors are subject to being shut down and or having work rejected if proper notification is not given to the City.

Work shall not commence before 7:00 a.m. nor extend beyond sundown Monday through Friday. On Saturdays, work hours are from 8:00 a.m. to 6:00 p.m. No work is permitted on Sundays or Holidays unless authorized by the City. Existing roadways shall not be restricted between 7 & 9 AM and 3 & 6 PM unless approved by the City Engineer.

The definition of "Work" also includes the starting of equipment and the delivery of materials to the job site.

02104.2 INSPECTION AND HANDLING –Sanitary Sewer Installation
Proper and adequate implements, tools, and facilities satisfactory to the City Engineer or a designee shall be provided and used by the Contractor for the safe and convenient prosecution of the work. During the process of unloading, all pipe and accessories shall be inspected by the Contractor for damage. The Contractor shall notify the City Engineer or a designee of all material found to have cracks, flaws or other defects. The City Engineer or a designee shall inspect the damaged materials and have the right to reject any materials found to be unsatisfactory. The Contractor shall promptly remove all rejected material from the site. All materials shall be handled carefully, so as to prevent damage to protective coatings, linings, and joint fillings; preclude contamination of interior areas; and avoid jolting contact, dropping, or dumping.

All work and materials are subject to tests by the Owner at such frequency as may be determined by the City Engineer or a designee.

While suspended and before being lowered into laying position, each pipe section and appurtenant unit shall be inspected by the Contractor to detect damage or unsound conditions that may need corrective action or be cause for rejection. The Contractor shall inform the City Engineer or a designee of any defects discovered and the City Engineer or a designee will prescribe the required corrective actions or order rejection.

Immediately before placement, the joint surfaces of each pipe section and fitting shall be inspected for the presence of foreign matter, coating blisters, rough edges or projections, and any imperfections so detected shall be corrected by cleaning, trimming, or repair as needed.

02104.3 PIPE LAYING OPERATIONS –Sanitary Sewer Installation
Open cut placement of public PVC or H.D.P.E pipe shall not occur after November 30th or before March 31st.

Trench excavation and bedding preparations shall proceed ahead of pipe placement to permit proper laying and joining of the pipe units at the prescribed grade and alignment without unnecessary deviation or hindrance.

All foreign matter or dirt shall be removed from the inside of the pipe and fittings before they are lowered into position in the trench and they shall be kept clean by approved means during and after laying. The sewer materials shall be carefully lowered into laying position by the use of suitable restraining devices. Under no circumstances shall the pipe be dropped into the trench.

At the time of pipe placement, the bedding conditions shall be such as to provide uniform and continuous support for the pipe between bell holes. Bell holes shall be excavated as necessary to make the joint connections, but they shall be no larger than would be adequate to support the pipe throughout its length. No pipe material shall be laid in water or when the trench or bedding conditions are otherwise unsuitable or improper.

When in the City Engineer or a designee's opinion, placement or handling precautions prove inadequate, the Contractor shall provide and install suitable plugs or caps effectively closing the open ends of each pipe section before it is

lowered into laying position, and they shall remain so covered until removal is necessary for connection of an adjoining unit.

Unless otherwise permitted by the City Engineer or a designee, bell and spigot pipe shall be laid with the bell ends facing upgrade and the laying shall start on the downgrade end and proceed upgrade. As each length of bell and spigot pipe is placed in laying position, the spigot end shall be centered in the bell and the pipe forced home and brought to correct line and grade. The pipe shall be secured in place with approved backfill material, which shall be thoroughly compacted by tamping around the pipe to a height of at least 12 inches above the top with hand operated mechanical tamping devices or by hand. Backfill in the bell area shall be left short until the next section of pipe is placed.

Connection of pipe to existing lines or previously constructed manholes shall be accomplished as shown in the Plans or as otherwise approved by the City Engineer or a designee. Core drilling the pipe penetration into the existing manhole and the installation of a rubber boot is required. Where necessary to make satisfactory closure or produce the required curvature, grade or alignment deflections at joints shall not exceed that which will assure tight joints and comply with any limitations recommended by the pipe manufacturer.

Entrance of foreign matter into pipeline openings shall be prevented at all times to the extent that suitable plugs or coverings can be kept in place over the openings without interfering with the installation operations.

02104.4 JACKING/BORING –Sanitary Sewer Installation

The terms "auger", "boring", "jack", "jacking", and "tunneling" in the proposal, specifications, and plans refers only to non-open cut construction. The Contractor shall inspect and verify soil conditions to his own satisfaction in order to determine the type of construction to employ. During the construction, the Contractor shall be responsible for protecting all existing utilities above or below the pipe invert.

The minimum inside diameter of the casing pipe shall be four (4) inches greater than the outside diameter of the bell of the carrier pipe. For any installation beneath a railroad, the top of the casing pipe shall not be closer than the specified dimensions indicated in the railroad permit.

The steel casing minimum wall thickness shall be as specified on the Plans, in the Special Provisions, or in the applicable Permit. Where required by the City Engineer or a designee, two 17-pound anode packs shall be attached to the casing for corrosion protection.

A 1-1/2 inch pipe shall be forced along the top of the casing pipe. The front end of this pipe shall be 18 inches behind the front end of the casing pipe. A mixture of water and bentonite clay shall be forced through this pipe at all times during the casing installation to fill any voids that may be present above the casing pipe. Upon completion of the casing installation, this pipe shall be slowly withdrawn while bentonite is forced through the pipe to fill any remaining voids.

The Contractor shall prevent excavated materials from flowing back into the excavation during the non-open cut construction. This shall include the use of a shield conforming to the size and shape of the casing that will prevent materials from flowing into the leading edge of the casing. The jacking machine used shall be capable of controlling line and grade and shall conform to the size and shape of the casing pipe.

No jacking/augering of pipe will be allowed below the water table unless the water table has been lowered sufficiently to keep the water below the pipe being installed. The use of water under pressure (jetting) or puddling will not be permitted to facilitate jacking/augering operations.

If any installation is augered, the head shall be approved by the City Engineer or a designee and the auger shall be located six (6) inches behind the lead edge of the casing or carrier pipe.

If a void develops, the jacking/augering shall be stopped immediately and the void shall be filled by pressure grouting. The grout material shall consist of a sand-cement slurry of at least two sacks of cement per cubic yard and a minimum of water to assure satisfactory placement.

Skids and blocking shall be used as necessary to install the carrier pipe to the proper line and grade inside the casing pipe. Voids between carrier and casing pipes shall be filled with sand and the casing pipe sealed at both ends with a suitable material to prevent water or debris from entering the casing pipe.

02104.5 DIRECTIONAL BORING –Sanitary Sewer Installation

Directional boring/drilling installation shall be accomplished where required on the Plans or in the Special Provisions to minimize disturbance of existing surface improvements. The installer shall have a minimum of three years of experience in this method of construction and have installed at least 1,000 feet of 8-inch or larger diameter pipe to specified grades. The field supervisor employed by the Contractor shall have at least three years of experience and shall be at the site at all times during the boring/drilling installation, and be responsible for all of the work.

The Contractor shall submit boring/drilling pit locations to the City Engineer or a designee before beginning construction.

The drilling equipment shall be capable of placing the pipe as shown on the plans. The installation shall be by a steerable drilling tool capable of installing continuous runs of pipe, without intermediate pits, a minimum distance of 200 feet. The guidance system shall be capable of installing pipe within 1-1/2 inch of the plan vertical dimensions and 2 inches of the plan horizontal dimensions. The Contractor shall be required to remove and reinstall pipes which vary in depth and alignment from these tolerances.

Pull back forces shall not exceed the allowable pulling forces for the pipe being installed. Drilling fluid shall be a mixture of water and bentonite clay and shall be designed to meet existing soil conditions. Disposal of excess fluid and spoils shall be the responsibility of the Contractor.

02104.6 CONNECTION AND ASSEMBLY OF JOINTS –Sanitary Sewer Installation

All pipe and fitting joints shall fit tightly and be fully closed. Spigot ends shall be marked as necessary to indicate the point of complete closure. All joints shall be watertight in all sanitary sewer pipe lines. Where specified, the joints in certain assemblies shall be made structurally integral by being completely encased in concrete to form a rigid watertight unit as indicated in the standard drawings. All joints shall be assembled gasket seal joints.

02104.7 EXTERNAL JOINT SEALING OF MANHOLE BARREL JOINTS –Sanitary Sewer Installation

Each manhole barrel joint shall be sealed with a 6" wide external rubber sleeve similar to the [Infi-Shield Gator Wrap](#) as manufactured by Sealing Systems, Inc. or approved equal. The seal shall be a single continuous rubber band installed on a clean surface to prevent leakage of water through the joint sections of a manhole. Manhole joint sealing shall be considered incidental unless otherwise noted.

02104.8 I/I BARRIERS –Sanitary Sewer Installation

The [Striker Products I/I Barrier](#) or Ess Brothers "27Sx18 Alignment Barrier" is cut to height and installed on top of the manhole cone. The cut height is determined by adding the adjustment ring stack up dimension to the inside height of the cover frame. Caution should be used to not interfere with the complete seating of the cover into the frame. The joints between the manhole cone and the I/I or Alignment barrier is sealed using butyl mastic caulk. The (HDPE) adjustment rings, cover frame and cover are then installed as usual.

The bottom surface of the I/I or Alignment barrier flange shall be sealed to the manhole cone top surface using a butyl sealant such as "Ramnek" or specified by the manufacturer.

The sealant shall be applied to the top surface of the manhole cone section only. Sufficient sealant must be used to accommodate flaws in the cone surface and out-of-flat conditions. The amount of sealant and its placement will be determined by the condition of the cone. This determination will be the responsibility of the contractor installing the I/I BARRIER. The Striker Products I/I BARRIER is then centrally seated on the cone against the sealant. The bottom adjustment ring is then centrally placed on the top surface of the I/I BARRIER flange using no sealant.

When (HDPE) adjustment rings with a vertical tongue are used, the tongue must be cut off to allow the bottom ring to lay flush on the I/I or Alignment barrier flange. This removal should be done per instructions from the adjustment ring manufacturer. The chimney section is then completed based on the type of adjustment rings being utilized. The I/I or Alignment barrier shall be installed per the manufacture's installation instruction on a clean/dry structure. See Standard Detail Plate [SS-3](#). I & I barriers and adjusting rings shall be considered incidental unless otherwise noted.

02104.9 ADJUSTING CASTING –Sanitary Sewer Installation

Adjust castings within 10 days after initial bituminous course placement. Keep excavation of adjustments to a minimum. Replace excavated areas in kind. Replace or install all adjusting rings and set the top of casting to 1/2" below and parallel to the proposed roadway surface. Install (2"x2"x1/4") plastic or fiberglass shims as necessary to reach this elevation. Set casting and each ring on inflow and infiltration barrier. Provide 6" P.E. adjusting ring if structure will have 4 or 5 rings and 12" P.E. adjusting ring if there will be 6 or more rings. Use two ring minimum and 12" maximum rings when setting castings.

02105 SANITARY SEWER TESTING REQUIREMENTS

In order to assure quality materials and workmanship, the following tests shall be required unless waived by the City Engineer or a designee. The City Engineer or a designee shall be present for all tests of public utilities and shall be notified at least 48 hours in advance of the specific test by calling (763) 509-5500. Testing shall be completed after all the

utility pipes have been installed in the area to be tested and prior to commencement of the street construction.

All tests shall be in accordance with CEAM standards or what is required within this specification. Individuals qualified to perform and evaluate such tests shall do all testing. The contractor shall pay for all tests required in these specifications. Copies of the results shall be submitted to the City Engineering Division. Disposal of any wastewater or any test water into the City sanitary sewer system is NOT allowed.

In the event of a test failure on any test section, the section shall be replaced, with all repair work subject to approval of the City. The replaced section shall be retested for leakage, deflection and re-televised in conformance with the specifications contained herein. All repairs, replacement and retesting shall be at the Contractor's expense.

02105.1 LEAKAGE TESTING

.1A EXFILTRATION

The pipeline shall be sealed with a plug whose sealing length is greater than the diameter of the pipe and constructed in such a manner that it will not require external blocking or bracing and maintain a seal against the line's test pressure.

All wyes, tees, outlets or ends of lateral sewers shall be suitably capped and braced to withstand the internal pressures. Such caps or plugs shall be easily removable.

One plug shall be tapped for the air supply hose and the return air pressure hose. The air supply hose, connected from the compressor to the plug shall be a throttling valve, bleeding valve and shut off valve for control. The air pressure tap shall have a sensitive pressure gauge, 0 to 10 psi range, protected by a gauge cock and a pressure relief valve set at 10 psi.

In performing the test, air is added slowly to the pipeline until pressure inside the pipeline reaches 4.0 psi. If air is added too rapidly, the test accuracy will decrease because a change in temperature also has an effect on the change in pressure. When the air pressure inside the pipeline reaches 4.0 psig above external hydrostatic pressure, the supply air is stopped. A minimum two-minute time interval is allowed for the temperature difference to stabilize before the actual test is performed. If the air pressure drops below 3.5 psig during this time interval, more air will be supplied to the pipeline and throttled to maintain a pressure between 3.5 psig and 4.0 psig for a minimum of two minutes after which time the supply air will be shut off.

The portion of line being tested shall be accepted if the portion under test does not lose air at a rate greater than 0.0015 cfm per square foot (for PVC & DIP) or 0.003 cfm per square foot (for RCP) per internal pipe end area at an average pressure of 3.0 psig greater than any back pressure exerted by groundwater that may be over the pipe at the time of test.

All test gauges are to be set up above ground.

Air test: For a typical 8" PVC pipe the test would be at four pounds held for five minutes with no more than a 0.5 psi loss. For others see the following table.

The test shall be accomplished by determining the time in minutes for the pressure to decrease from 4.0 psig to 3.5 psig greater than the average groundwater that may be over the pipe. That time shall not be less than the time shown on the given diameter in the following table:

Pipe Dia. in Inches	Minutes for PVC & DIP	Minutes for RCP
4	2.0	1.0
6	3.0	1.4
8	5.0	1.9
10	8.0	2.4
12	12.0	2.9
15	18.0	3.4
18	25.0	4.3
21	35.0	5.0
24	45.0	5.7

If the pipeline fails to meet the requirements of the test, the Contractor shall, at their own expense, determine the source of leakage and then repair or replace that portion of the pipe.

.1B Hydrostatic test

Hydrostatic test rate of loss from pipe with 3 feet of head above the invert or groundwater in the second hour of the 2 hour test cannot exceed CEAM standard.

.1C Infiltration

Same loss as hydrostatic test

.1D Forcemain Hydrostatic Test

Pressure - 75 p.s.i. for 2 hours with 0 (zero) pounds allowable pressure loss during the first hour and no more than 2 pounds allowable pressure loss during the second hour. Gauge to be used will be an Ashcroft, Model 1082, 4½" diameter in one p.s.i. increments or approved equal.

02105.2 TELEVISIONING OF LINES

All sanitary sewer lines shall be televised and the video report in MPEG format along with a written report to be submitted to the City for review. Televising shall be considered incidental unless otherwise noted. Video reports can be submitted on CD-ROM, DVD compact disks, thumb drives, internet cloud or other approved means. All lines must be flushed/jetted to assure they are cleaned prior to televising. The video report will be used to view the condition of the sanitary sewer pipe prior to acceptance. Workmanship and cleanliness of the installation will be checked. If the line requires cleaning or repairs then that segment shall be re-televised afterwards and the new report will be submitted to the City for review. This shall be repeated until the segment of the sanitary sewer line is clean and or repaired. Video reports shall become the property of the City and contain the following:

.2A reference the start and end of each video segment as it begins, by clearly identifying the manhole number where the video segment begins and the manhole number where the video segment ends.

.2B footages along the sewer line must be shown on the video report and zeroed out at the beginning of each segment starting from the center of the manhole.

.2C the video camera shall be guided forward at a moderate to slow pace along the bottom of the pipe.

.2D the camera shall stop and rotate up to view each service wye.

.2E the camera shall stop at any unusual instances that are viewed while in progress and provide a more detailed and longer view of the specific instance (i.e. – bad joint, dirt in lines, settlement in line, etc.).

02105.3 MANDREL/DEFLECTION TEST OF PLASTIC PIPE

Deflection tests shall be performed on all plastic gravity sewer pipes, including stubs over 50' in length. The test shall be conducted after the sewer trench has been backfilled to the desired finished grade and has been in place for 30 days.

The deflection test shall be performed by pulling a rigid ball or nine-point mandrel through the pipe without the aid of mechanical pulling devices. The ball or mandrel shall have a minimum diameter equal to 95% of the actual inside diameter of the pipe. The maximum allowable deflection shall not exceed five percent of the pipe's internal diameter. The line will be considered acceptable if the mandrel can progress through the line without binding. The time of the test, method of testing, and the equipment to be used for the test shall be subject to the approval of the City Engineer or a designee.

All testing shall be performed by the Contractor at his expense without any direct compensation being made therefore, and he shall furnish all necessary equipment and materials required unless otherwise noted.

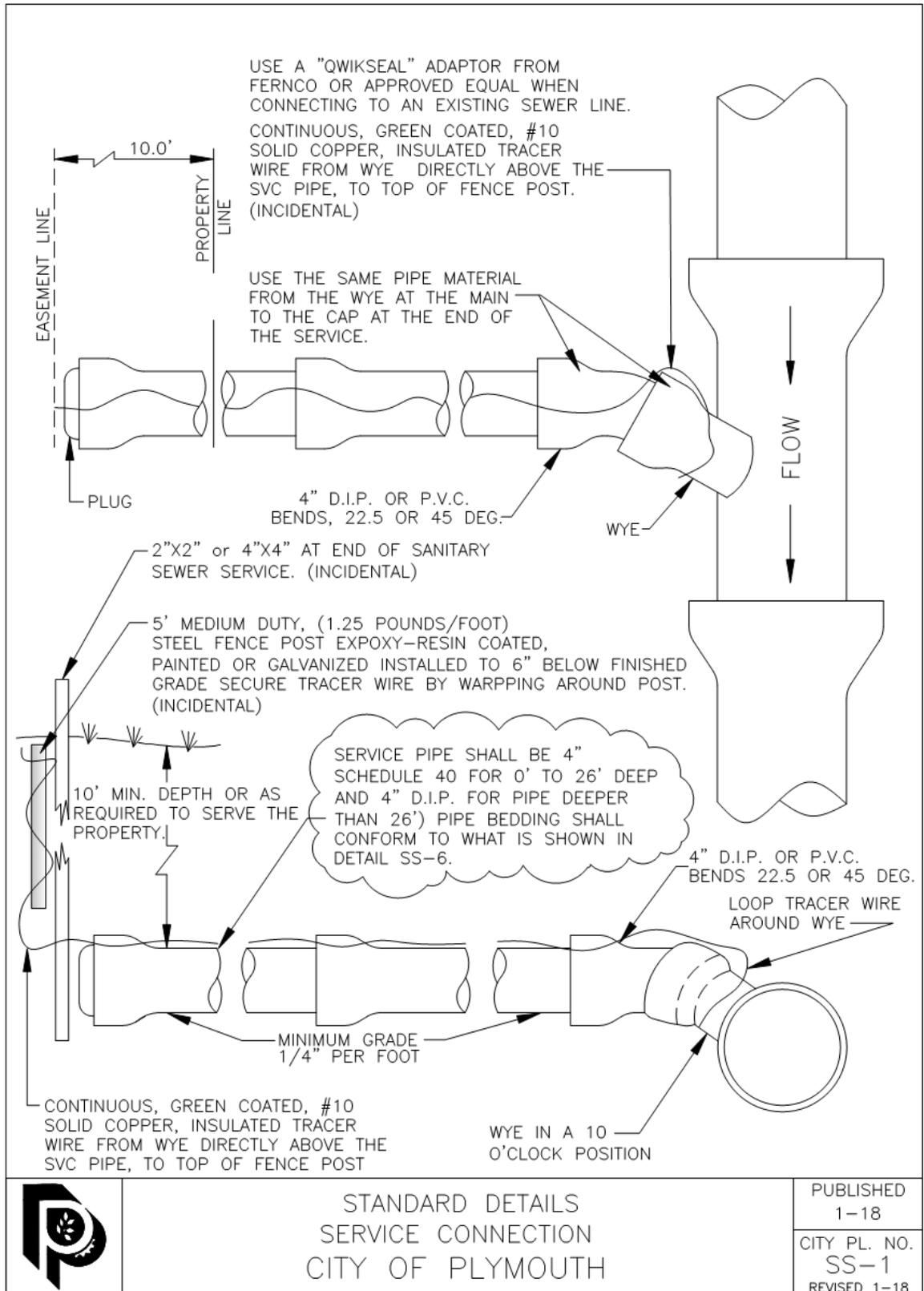
02106 MEASUREMENT AND PAYMENT

All items will be measured separately according to design designation as indicated in the Pay Item name and as may be detailed and defined in the Plans, Specifications, or Special Provisions. Pipe will generally be designated by size (inside diameter or span), strength class, kind or type, and laying condition.

Complete-in-place items shall include all component parts thereof as described or required to complete the unit, but excluding any excesses covered by separate Pay Items. Linear measurement of piping will include the running length of any special fittings (tees, wyes, elbows, gates, etc.) installed within the line of measure between specified terminal points.

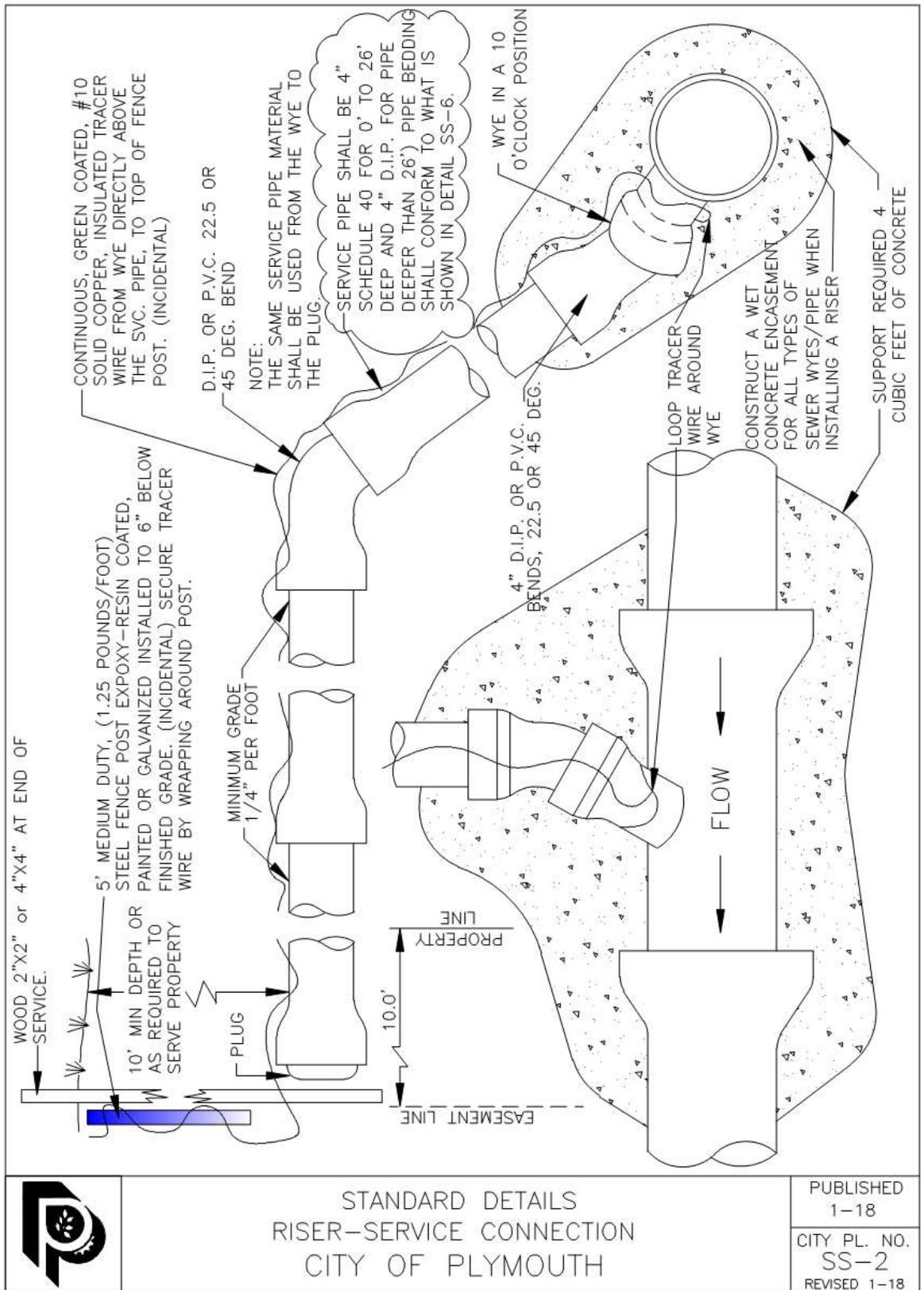
02107 SANITARY SEWER DETAIL PLATES

SS-1 through SS-9



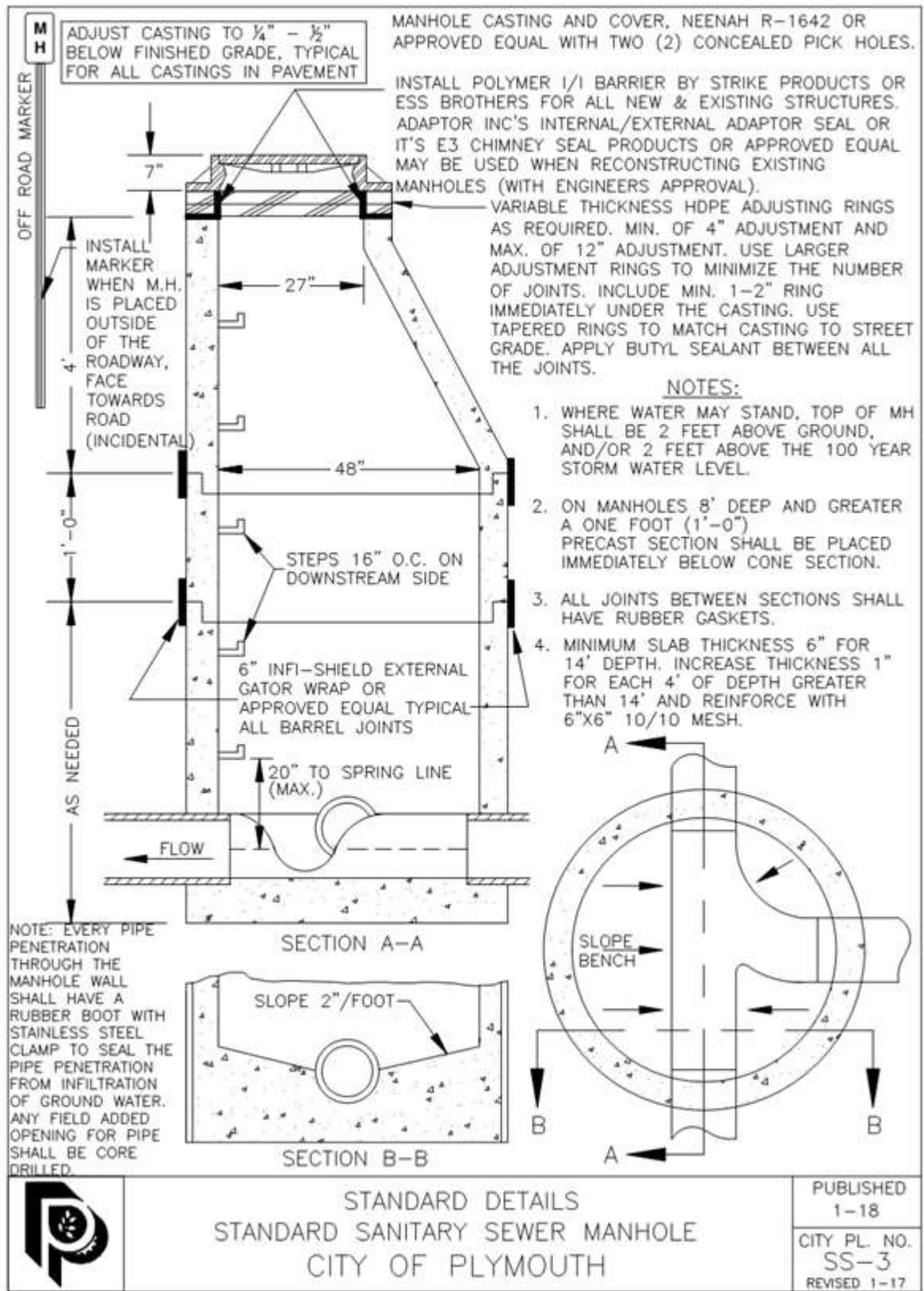
STANDARD DETAILS
SERVICE CONNECTION
CITY OF PLYMOUTH

PUBLISHED
1-18
CITY PL. NO.
SS-1
REVISED 1-18

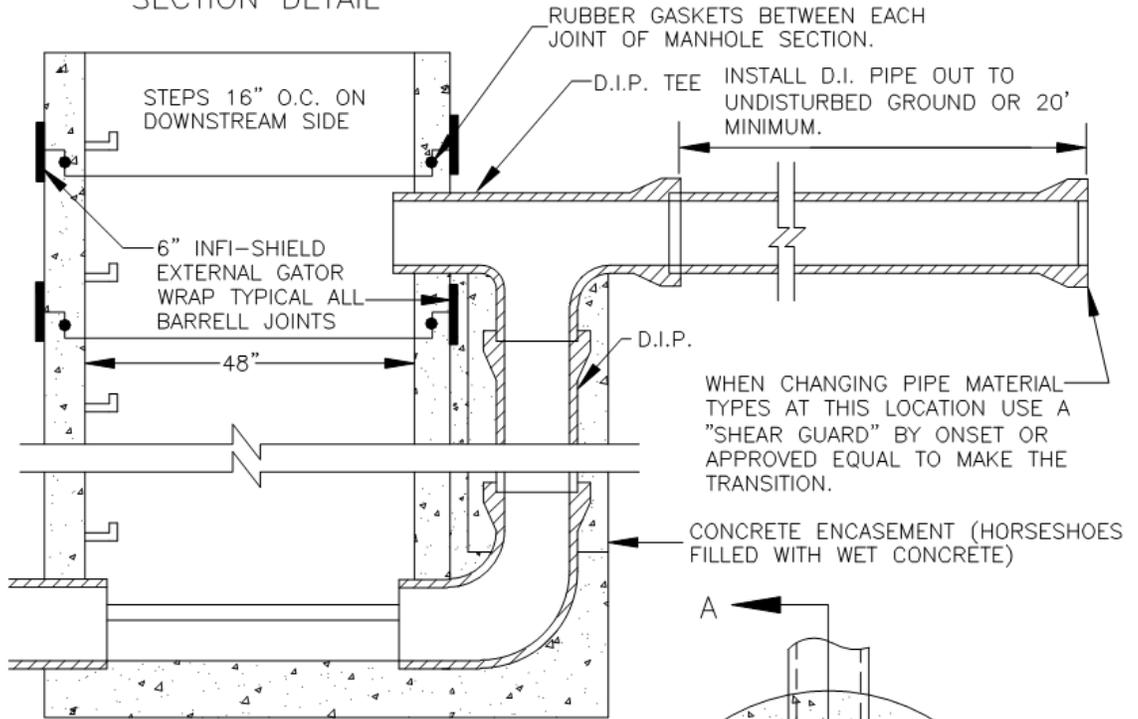


STANDARD DETAILS
 RISER-SERVICE CONNECTION
 CITY OF PLYMOUTH

PUBLISHED 1-18
 CITY PL. NO. SS-2
 REVISED 1-18

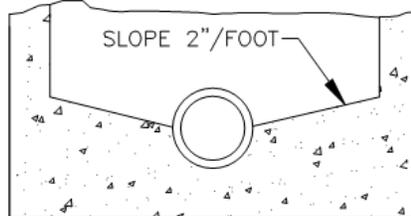


SEE SS-3 FOR TOP SECTION DETAIL

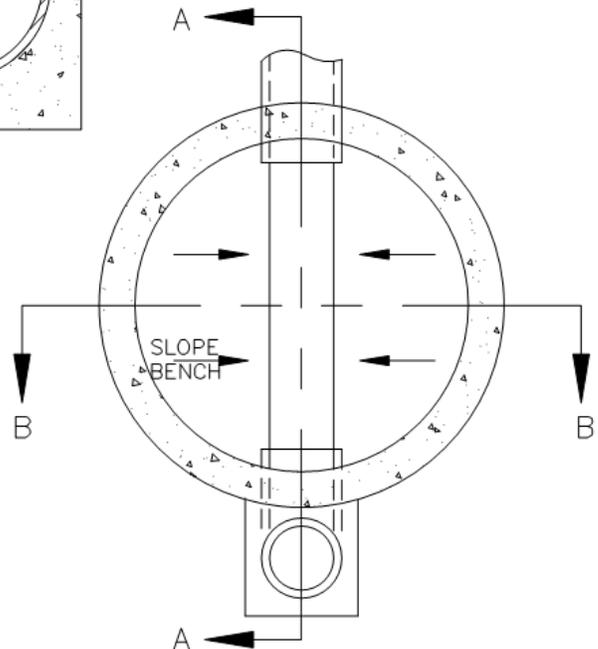


SECTION A-A

NOTE:
 THE TOP OF THE DROP PIPE SHALL BE EQUAL TO OR ABOVE THE TOP OF THE OUTLET PIPE. IF THE OUTLET PIPE IS MORE THAN TWICE THE DIA. OF THE DROP PIPE, THEN THE FLOW LINE OF THE DROP PIPE SHALL BE EQUAL OR ABOVE THE SPRING LINE OF THE OUTLET PIPE.



SECTION B-B

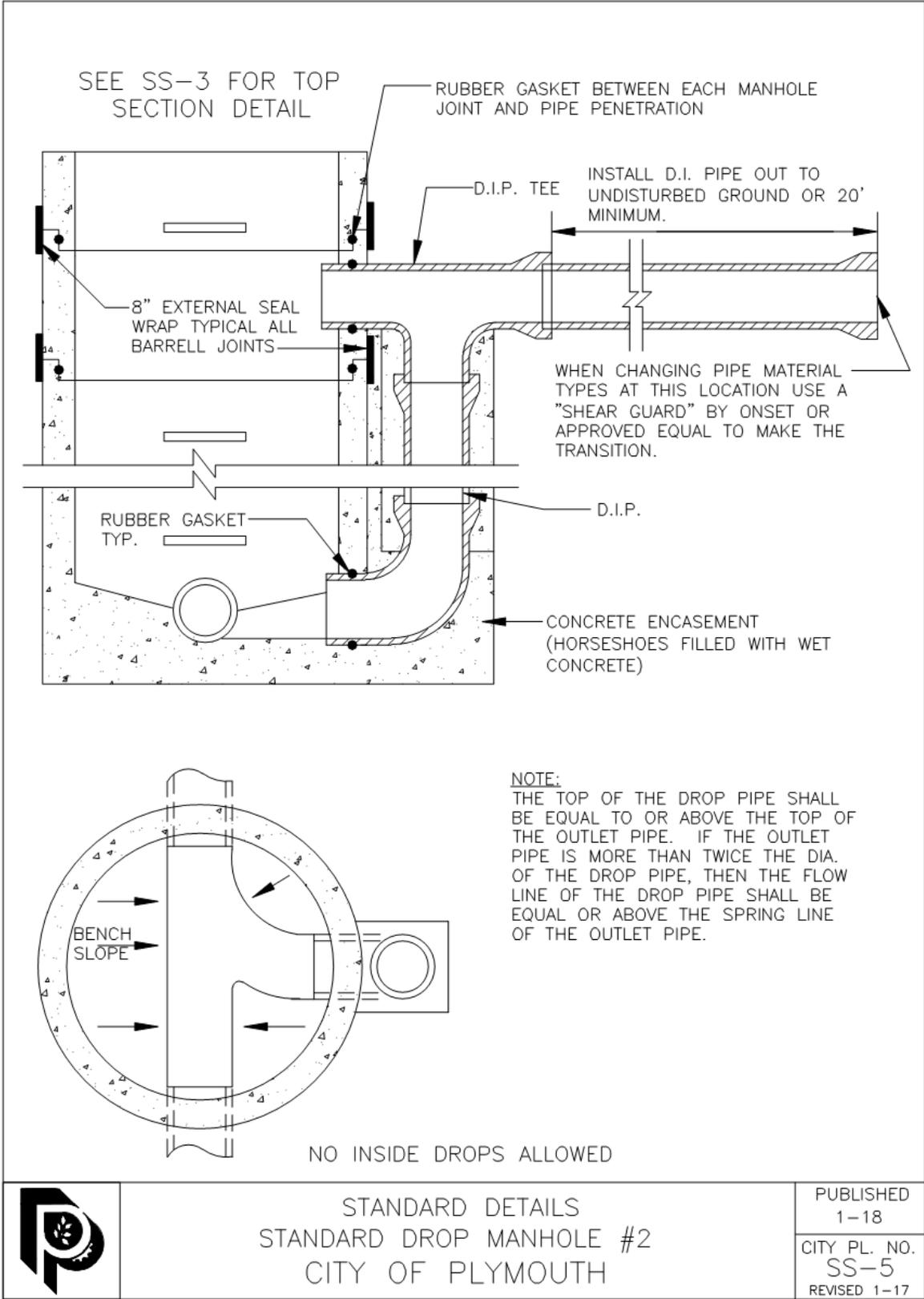


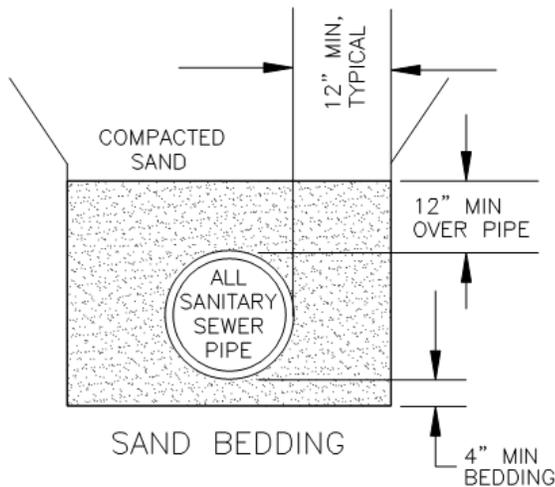
NO INSIDE DROPS ALLOWED



STANDARD DETAILS
 STANDARD DROP MANHOLE #1
 CITY OF PLYMOUTH

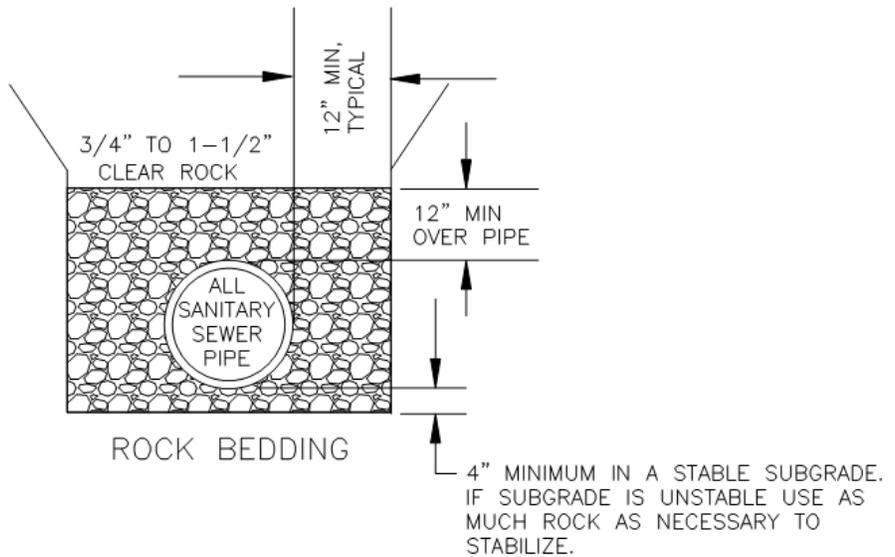
PUBLISHED
 1-18
 CITY PL. NO.
 SS-4
 REVISED 1-17





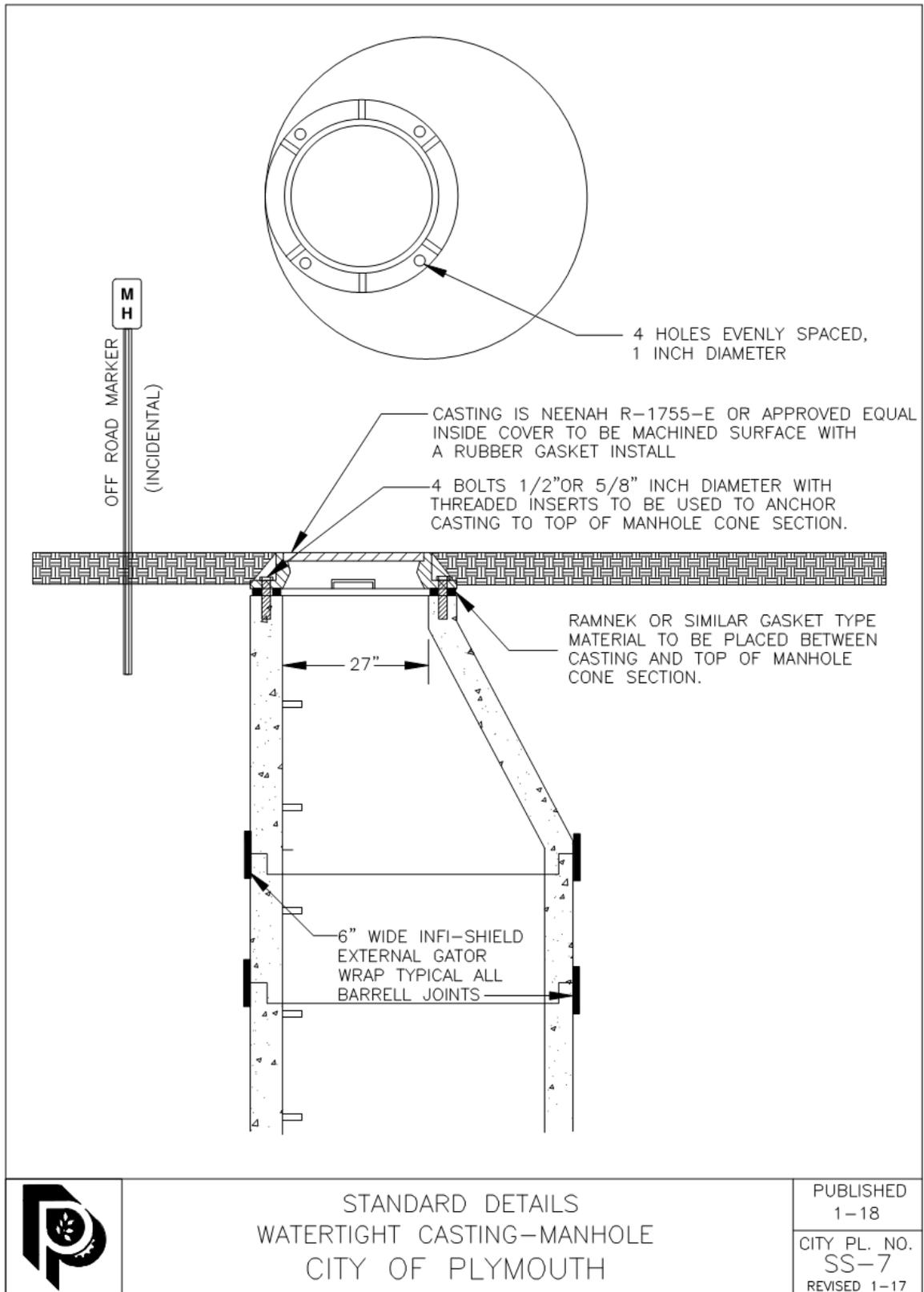
SAND SHALL CONFORM WITH MN/DOT SPEC. 3149.2B2 (SELECT GRANULAR)

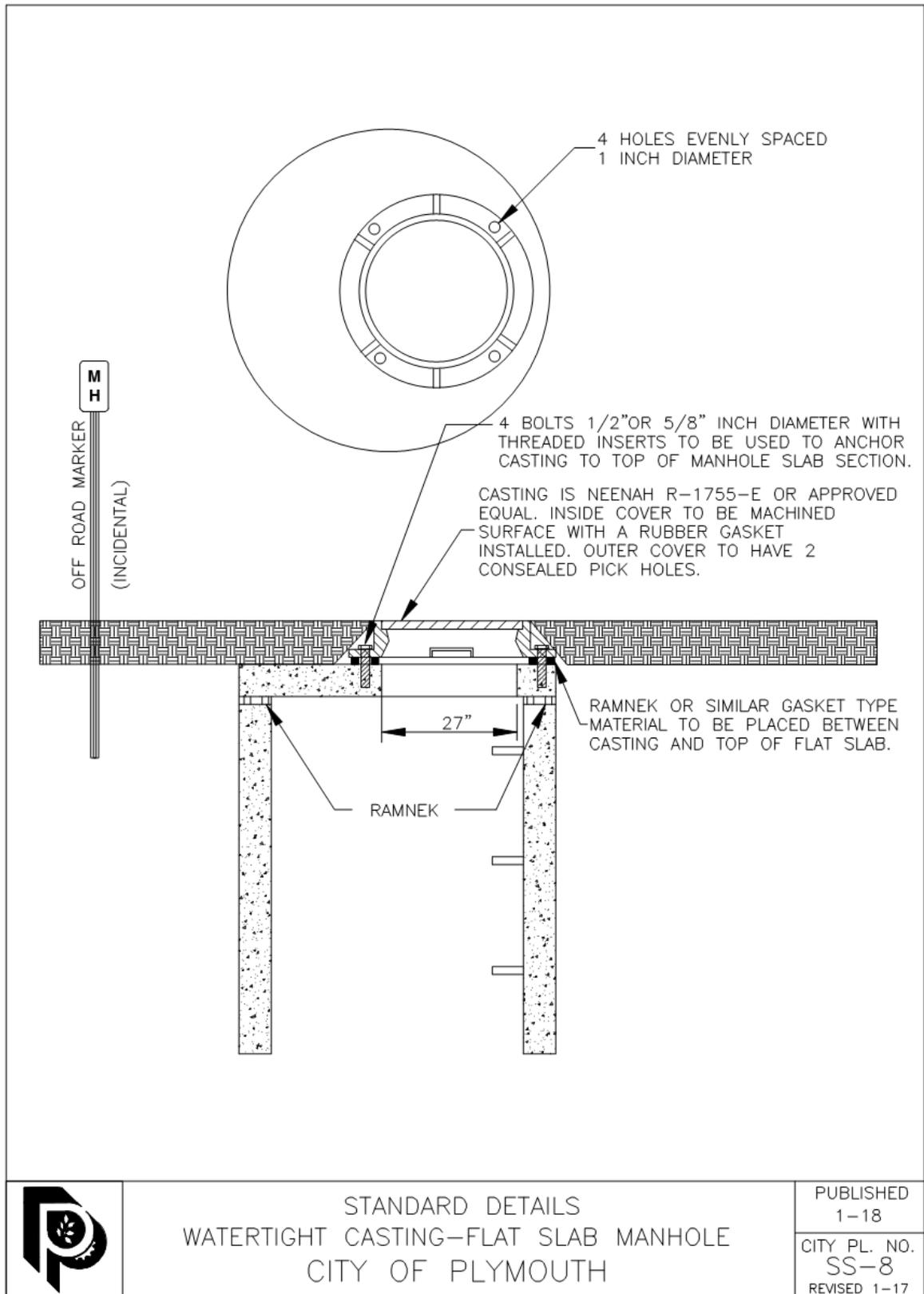
NOTE:
BEDDING SHALL BE CONSIDERED INCIDENTAL TO THE PIPE UNLESS MODIFIED IN THE CONTRACT DOCUMENTS. BEDDING REQUIRED FOR ALL MAINS AND SERVICES.



STANDARD DETAILS
SANITARY SEWER BEDDING
CITY OF PLYMOUTH

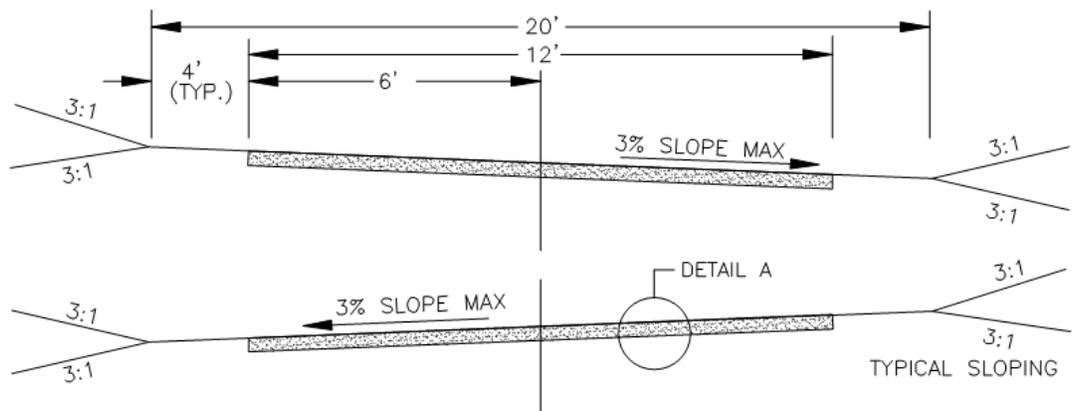
PUBLISHED
1-18
CITY PL. NO.
SS-6
REVISED 1-17



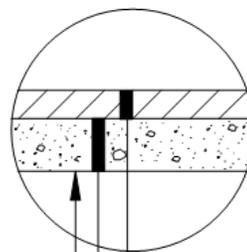
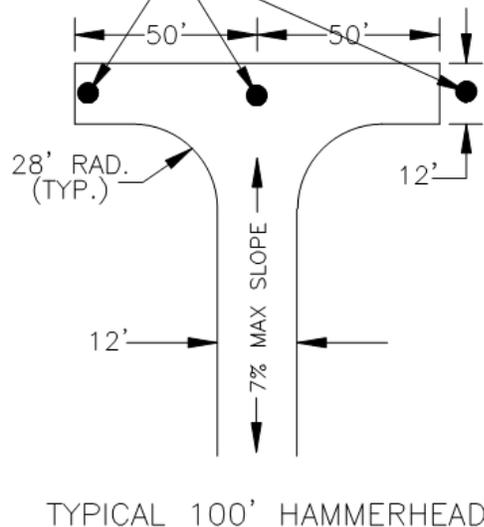


OFF ROAD SANITARY SEWER MANHOLES MUST BE MADE ACCESSIBLE TO THE CITY'S MAINTENANCE VEHICLES. A 12' WIDE ACCESS ROAD WITH A TURN AROUND SHALL BE CONSTRUCTED BY EACH STRUCTURE. (INCIDENTAL UNLESS OTHERWISE NOTED)

WHERE A PEDESTRIAN TRAIL IS TO BE USED FOR SANITARY SEWER STRUCTURE ACCESS THIS DETAIL SHALL SUPERCEDE THE TYPICAL TRAIL DETAIL EXCEPT THE SLOPES SHALL BE DESIGNED TO MEET ADA REQUIREMENTS.



POSSIBLE MANHOLE STRUCTURE LOCATIONS.
PAVE ALONG SIDE OF THE STRUCTURES WHERE POSSIBLE.



DETAIL A

- 3" BIT. WEAR MN/DOT SPEC. 2360 TYPE SPWEA240B
- 12" AGG. BASE CLASS 5 OR 7 MN/DOT SPEC. 3138 A2 (100% CRUSHED)
- APPROVED SUBGRADE



STANDARD DETAILS
OFF ROAD UTILITIES ACCESS DRIVE
CITY OF PLYMOUTH

PUBLISHED
1-18
CITY PL. NO.
SS-9
REVISED 1-17



**STANDARD SPECIFICATIONS
FOR
WATERMAIN CONSTRUCTION**

CITY OF PLYMOUTH, MINNESOTA

JANUARY 2018

ENGINEERING DIVISION

3400 PLYMOUTH BLVD.
PLYMOUTH, MN USA 55447-1482
TELEPHONE (763) 509-5500

A handwritten signature in black ink, appearing to read 'Jim Renneberg', is centered on the page.

Jim Renneberg, P.E.
City Engineer

These specifications are intended for inclusion into the contract documents. They only address the technical specifications and construction details of the referenced section.

**SECTION 02200
STANDARD DETAIL SPECIFICATIONS
FOR
WATERMAIN CONSTRUCTION**

CITY OF PLYMOUTH, MINNESOTA USA

**JANUARY 2018
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Print on Blue Paper

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02201 SCOPE OF WORK

The work to be done under this contract shall include the furnishing of all labor, materials, tools and equipment to construct complete in place the watermain and all appurtenances as shown on the drawings, plans and as specified herein.

The Contractor shall excavate all materials encountered, furnish and compact foundations where required, furnish and install all timbering, sheeting and bracing necessary to safely support the work, remove any ground water encountered during excavation operations, protect, repair, relocate, maintain and restore all sub-surface, surface and overhead structures directly disturbed, damaged or affected by construction operations and furnish all backfill and other appurtenant items and services as necessary.

All site grading must be completed, certified by the project Engineer and all "Off Road" grading equipment removed from the site before starting any public utility work. When installing public utilities in a new residential development all builder and developer construction activity shall pause until the public utilities have been installed, tested and the streets built.

02202 USE OF EXISTING WATER SYSTEM

Only designated City personnel shall have the authority to operate any hydrants or valves that make up Plymouth's water distribution system. Contractors shall not operate existing gate valves or hydrants.

It is the Contractors responsibility to make arrangements for receiving water from public or private sources, secure necessary permits and pay regular charges. City water may be purchased at the Public Works facility, [14900 23rd Ave.](#) or at the Zachary Lane Treatment Plant, [4295 Zachary Lane.](#) Under no circumstances shall existing hydrants be used to supply water.

City personnel shall do the initial filling of new water mains for service installations and testing.

Disposal of any wastewater or any test water into the City sanitary sewer system is not permitted.

A minimum of 48-hour notice is required to Plymouth's utility division if the existing water system requires a shutdown and disruption of service to the existing system customers. In some cases the shutdown may be required to be completed overnight or on weekends depending on the needs of the system customer.

02203 SPECIFICATIONS WHICH APPLY

All specifications contained herein, including attached detail drawings, together with the construction plans for the designated project or projects and including current versions of those portions of the following specification, as indicated by paragraph or designation number, shall apply: American Society for Testing Materials ([ASTM](#)); American National Standards Institute ([ANSI](#)); American Water Works Association ([AWWA](#)); Minnesota Department of Transportation "Standard Specifications for Construction" current addition including Special Provisions ([MnDOT](#)); and The "City Engineers Association of Minnesota", Standard Specifications for Utility Construction ([CEAM](#)).

02204 WATERMAIN MATERIALS

All watermain pipes, hydrants, valves, fittings and all appurtenances shall be new materials, free of any defects and shall be of the type, size, strength, and quality as shown on the plans and as specified herein and/or as indicated in the Special Provisions.

The contractor may be required to secure and deliver to the City Engineer or designee a written statement from the manufacturer assuring the quality and compliance to the applicable specification of all materials furnished and installed under this improvement project. This shall in no way relieve the Contractor of any responsibility as to the quality of materials furnished and installed.

02204.1 PIPE BEDDING MATERIAL –Watermain Materials

Pipe bedding material shall be in accordance with City Standard detail plate [W-6](#), utilizing sand conforming to MnDOT specification [3149.2B2](#) or ¾" to 1 ½" clear rock as determined by the existing soils conditions. The contractor shall provide Certification of the materials being used and will be required to perform field sampling for gradation test of any bedding materials used as required by the City Engineer. Copies of test results shall be submitted to the City in a timely manner. Bedding shall be considered incidental to the pipe installation unless noted otherwise in the contract documents.

02204.2 POLYVINYL CHLORIDE PRESSURE PIPE (PVC) –Watermain Materials

PVC Water Main Pipe shall conform to the latest revision of AWWA's Specification C900 for (4"–12" dia. PVC pipe), C905 for (14"–24" dia. PVC pipe). All 4" to 12" pipe shall be a minimum Pressure Class of 165 psi, DR 25. All 14" to 24" pipe shall be a minimum Pressure Class of 235 psi, DR 18. C909 pipe for (4"-12" dia. PVCO pipe) will be considered in place of C900 with written approval of the City Engineer. All pipes shall be marked with the manufacturer's name, date, nominal size, type of plastic and pressure rating. All PVC pipe used for potable water lines shall be [blue in color](#). Pipe shall be new, manufactured within the past 12 months as determined from the date stamp on the pipe and free of defects. Pipe will be rejected if surface chalking from UV exposure is visible. Pipe O.D. shall be equivalent to ductile iron pipe of the same nominal size. Maximum length of each PVC section of pipe between elastomeric rings shall be 20 feet (± 1") for all sizes.

.2A PVC PIPE JOINTS

Pipe joints shall consist of an integral wall section with a factory installed, solid cross section elastomeric ring which meets the requirements of ASTM F-477. The bell section shall be designed to be at least as hydrostatically strong as the pipe wall and meet the appropriate requirements of AWWA for C900, C905, and C909 pipe.

02204.3 HDPE WATERMAIN PIPE –Watermain Materials

HDPE pipe for horizontal directional drilling shall be HDPE AWWA C906 DIPS and a Dimension Ratio (DR) as shown on the drawings. Pipe shall be new, manufactured within the past 12 months as determined from the date stamp on the pipe and free of defects. Pipe will be rejected if surface chalking from UV exposure is visible. The pipe shall contain no recycled compound except that generated in the manufacturer's own plant. The pipe shall be homogeneous throughout and free of visible cracks, holes, gouges, voids, foreign inclusions, or other defects that may affect the wall integrity. The materials shall be listed by the Plastic Pipe Institute (PPI), a division of the Society of the Plastic Industry in PPI TR-4 with a 73° F hydrostatic design basis of 1,600 psi and a 140° F hydrostatic design basis of 600 psi. The PPI listing shall be in the name of the pipe manufacturer and shall be based in ASTM D 2837 testing.

.3A BUTT FUSION FITTINGS FOR HDPE PIPE

HDPE fittings shall be PE3408 HDPE, Cell Classification of 345464C as determined by ASTM D3350-99, and approved for AWWA use. Butt fusion fittings shall have a manufacturing standard of ASTM D3261. Molded & fabricated fittings shall have a pressure rating equal to the pipe unless otherwise specified in the plans. Fabricated fittings are to be manufactured using Data Loggers. Temperature, fusion pressure and a graphic representation of the fusion cycle shall be part of the Quality Control records. All fittings shall be suitable for use as pressure conduits, and per AWWA C906, have nominal burst values of three and one half times the Working Pressure Ratings (WPR) of the fittings.

.3B FLANGED AND MECHANICAL JOINT ADAPTORS

Flanged and Mechanical Joint Adaptors shall be PE 3408 HDPE, Cell Classification of 345464C as determined by ASTM D3350-99, Flanged and Mechanical Joint Adaptors shall have a manufacturing standard of ASTM D3261. Fittings shall have a pressure rating equal to or greater than the pipe unless otherwise specified on the plans. Backed rings for flanged and mechanical joint adaptors shall be ductile iron, and bolts for fasteners shall be stainless steel, ASTM F 593 Type 304.

02204.4 PIPE RESTRAINTS –Watermain Materials

All watermain fittings shall be restrained to the pipe using Megalugs manufactured by [EBAA Iron, Inc.](#), "Series 2000PV" restraints for PVC & HDPE pipe and "Series 1100" restraints for DI or CI pipe or [Sigma "ONE-LOK" restraints](#) or STAR "Series 4000" for PVC & HDPE pipe and "Series 3000" for DI or CI pipe or approved equal.

02204.5 TRACER WIRE FOR WATERMAIN PIPE –Watermain Materials

Tracer wire shall be laid with all watermain and water services regard less of pipe material type and shall be insulated, **blue colored coating**, #10 minimum, solid copper core or #10 minimum, braided stainless steel and rated for underground service. Copperhead Industries 7x7 Stranded Copper Clad Steel break load 4700 # minimum, or approved equal tracer wire shall be used for directional boar watermain. The tracer wire loops shall be connected to all fire hydrants at a rear flange bolt using an aluminum angle iron hydrant tracer wire bracket part # HTWB-7000 made by "Vait Products" or approved equal. All spliced or repaired wire connections in the tracer wire system shall be made using a Wing Nut Wire Connector (for two to four number ten wires), and made waterproof using an approved buried service wire closure. The buried service wire closure shall be a [Klik-It II Number C8816](#) Buried Service Wire Closure or approved equal. See Standard Detail Plates [W-2](#) & [W-4](#).

02204.6 DUCTILE IRON PIPE (DIP) –Watermain Materials

Watermain larger than 24" shall be ductile iron pipe, thickness class 51, tar coated, Polyethylene wrapped in conformance with ANSI/AWWA C105 A21.5, cement lined in conformance with ANSI/AWWA C104 A21.4; designed to operate at 150 psi plus water hammer.

.6A PIPE JOINTS

Pipe joints shall be "Fastite" (American Cast Iron Pipe Company), "Bell-Tite" (James B. Clow and Sons, Inc.) or "Tyton" (U.S. Pipe and Foundry Company), except that mechanical joint, ductile iron, short body fittings,

cement lined, Class 250, shall be used for stub ends and all fittings. Copper straps or approved copper tipped gaskets are required.

02204.7 GATE VALVES, BOXES & BOX BASES –Watermain Materials

.7A GATE VALVES

American Flow Control 2500 series or Mueller 2360 series resilient seat wedge type gate valves shall be used on all sizes of watermain. See Standard Plates number [W-2](#) and [W-4](#). No butterfly valves shall be used. Epoxy coating shall be applied to all gate valves, meeting the requirements of AWWA C550. All gate valves shall be assembled with ASTM F 593 Type 304 stainless steel bolts where the bolts are below ground. And all gate valves are to be restrained no matter where they are in the system. Gate valves shall operate smoothly without any binding or hesitation if there are operation issues of any type the valve shall be replaced. Valve boxes, base adaptors and wire clips are incidental to the valve unless these items are called out in the projects bid-tab. See Standard Detail Plates [W-3](#) and [W-4](#).

.7B VALVE BOXES

Valve boxes shall be cast iron with #6 bases, screw type round drop cover with "WATER" imprinted on the top. (Refer to Standard Detail Plate [W-4](#)). The gate valve box shall consist of extended three piece totaling 7' 6" in standard height, more sections may be added as required for additional depth. No gate valve rod extensions are allowed unless the valve operating nut is greater than 12' deep.

.7C VALVE BOX BASE ADAPTORS

Valve boxes bases shall be [Adaptor Inc.'s "Valve Box Adaptor II #6 Base"](#) or approved equal.

.7D VALVE BOX TRACER WIRE CLIPS

Tracer wire clips distributed by [Vait Products Kit# GVTC-8000 or 8100](#) or approved equal shall be used on each section of the valve box to secure the tracer wire to the inside of the valve box. Route the tracer wire straight up one side of the valve box.

02204.8 DIP FITTINGS –Watermain Materials

DIP Fittings shall be ductile iron casting and have mechanical joints, Class 350 conforming to AWWA specification C153, covering compact fittings. Mechanical joints shall conform to AWWA Specification C111, latest revision, with gaskets made from vulcanized crude rubber compound. Fittings shall be epoxy coated on the inside and outside.

[Romac Industries ALPHA "Wide Range Restraints"](#) may be used in place of traditional restrained couplings, end caps and flanged couplings.

Mastic spray is to be used where any uncoated pipe or fitting is exposed such as welds, Megalugs, scraped coating, etc.

02204.9 BOLTS, NUTS & RODDING –Watermain Materials

All underground installed bolts, T-bolts, nuts and any rodding required shall be stainless steel, ASTM F 593 Type 304 for all watermain fittings including mechanical joints, hydrants, valves, tees, bends, taps, etc. Each bolt shall be

clearly stamped as a 593 Type 304 stainless steel bolt. No other type of bolts, nuts or rodding will be allowed unless approved in writing by the City Engineer. Anti-seize bolt/nut coating or spray/paste compound shall be used on all bolting operations.

02204.10 HYDRANTS –Watermain Materials

Hydrants shall be Waterous number WB67-250 or CLOW Medallion Hydrants, bright yellow in color. All below grade nuts and bolts shall be ASTM F 593 Type 304 stainless steel. Hydrants in a phased project must all be the same type. Gate valves with valve box bases and valve boxes shall be required for all hydrants. See Standard Detail Plate [W-2](#).

Hydrants, hydrant valves and service valves are to be secured to the watermain with MEGALUGS manufactured by EBAA Iron, Inc. or approved equal. Use MEGALUGS at all mechanical joints to tie the hydrant to the gate valve, gate valve to the tee and the tee to the main. DO NOT USE DUC LUGS FOR ANY TYPE OF RESTRAINT. See Standard Detail Plates [W-2](#) and [W-3](#).

All hydrant barrels shall be wrapped with Polyethylene encasement.

All hydrants will be installed with a reflectorized red and white, plastic composite hydrant locator attached. Exposed fiberglass or metal poles shall not be used. This hydrant locator will be the "Hydrafinder". See Standard Detail Plate [W-2](#).

Hydrants shall be painted yellow from the factory. Yellow paint is Waterous Enamel V1814, Bright Yellow or Sherwin Williams CLOW bright yellow. A hydrant's paint shall be touched up at the City's discretion.

All hydrants are to be at required height after lawns, boulevards, etc. are finished (sod, mulch, etc.). See Standard Detail Plate [W-2](#).

Hydrants shall be "bagged" (covered) with a black poly wrap or approved material immediately after installation and shall remained covered until all testing is complete and they are placed in service. At that time the contractor will be required to remove and dispose of the covering. Hydrant valves, valve boxes, base adaptors and wire clips are incidental to the hydrant unless these items are called out in the projects bid-tab.

02204.11 TAPPING SLEEVES AND VALVES –Watermain Materials

Tapping sleeves shall be all stainless steel, with flat-faced flange to mate with standard valves. Tapping sleeves and gate valves are required for all taps 4-inches and greater. Taps less than 4 inches shall be provided with a stainless steel service saddle. Tapping sleeves shall be a minimum of 6 feet from pipe joints or other fittings. All bolts and nuts used in conjunction with the tapping sleeve installation shall be ASTM F 593 Type 304 stainless steel.

02204.12 BUILDING SERVICES AND SERVICE SADDLES -Watermain Materials

.12A HDPE SMALL DIAMETER SERVICE PIPE

High Density Polyethylene Pipe (HDPE) SDR-9, Copper Tube Size (CTS) pipe shall be used for all small diameter building services conforming to AWWA Specification C901 and ASTM Specification 2737. A minimum of 1" outside diameter service shall be installed. A 1½" or larger outside

diameter service shall be installed where fire sprinklers are required or design dictates. Service pipe is to be one continuous piece with no joints or couplings, etc., allowed from main to curb stop. Compression fittings and "Insert Stiffeners" are required at all connections. See Standard Detail Plate [W-1](#).

.12B WATER SERVICE PARTS TABLE

The following is a parts list of the components approved for use in a small diameter building water service.

	Part # for Smith-Blair	Part # for Romac	Part # for Ford	Part # for McDonald	Part # for Mueller
1" WATER SVC AWWA C901 SDR 9 CTS					
Stainless Steel Service Saddles	372	306 and 305	FS 313	NA	NA
Corporation Stops (Ball Valve)	NA	NA	FB1000-4-G	4701-22	P-25028
Curb Stops (Ball Valve)	NA	NA	B44-444M-G	6104-22	B25155
Curb Stop Boxes 7-1/2' L Minneapolis Pattern w/rod (1-1/2" base)	NA	NA	EM2-75-46-72R	5614	H-10300
Curb Stop Caps	NA	NA	PS-LID	5614	89375
1-1/2" WATER SVC AWWA C901 SDR 9 CTS					
Stainless Steel Service Saddles	372	306 and 305	FS 313	NA	NA
Corporation Stops (Ball Valve)	NA	NA	FB1000-6-G	4701-22	P-25028
Curb Stops (Ball Valve)	NA	NA	B44-666M-G	6104-22	B-25155
Curb Stop Boxes 7-1/2' L Minneapolis Pattern w/rod (2" base)	NA	NA	EM2-75-47-72R	5615	H-10300-99002
Curb Stop Caps	NA	NA	PS-LID	5614	89375

02204.13 INSULATION –Watermain Materials

Insulation board (polystyrene) shall meet the requirements of [MnDOT 3760](#). Use a factor of 2 inches of polystyrene equals 1 foot of ground cover when determining thickness requirements. The 4' x 8' standard boards shall be orientated to provide a minimum coverage of 1.5' beyond the outside edge of the pipe being covered.

02204.14 POLYETHYLENE ENCASEMENT MATERIAL –Watermain Materials

Polyethylene encasement material shall conform to the requirements of AWWA C-105 for tube type installation and 8 mil nominal film thicknesses.

02204.15 SPRINKLER SYSTEMS –Watermain Materials

All materials shall be equal or better quality replacement parts for of the existing system being repaired.

02204.16 CHANNEL POST & MARKERS –Watermain Materials

U-Channel post used for structure marking shall be green, 6ft in length weighting 3lb/ft and punched full length with 3/8" diameter holes 1" on center. Marker signs shall be 0.063" thick aluminum blanks measuring 3" wide by 8" high with a high



intensity blue reflectorized background with white 2" high letters. Markers shall be attached to the post with two stainless steel bolts and nuts. Posts and markers shall be considered incidental unless otherwise noted.

02205 WATERMAIN INSTALLATION

02205.1 WORKING HOURS –Watermain Installation

The City Engineer or a designee shall be notified at least 48 hours prior to commencing any work. Phone # (763) 509-5500. Contractors are subject to being shut down and or having work rejected if proper notification is not given to the City.

Work shall not commence before 7:00 a.m. nor extend beyond sundown Monday through Friday. On Saturdays, work hours are from 8:00 a.m. to 6:00 p.m. No work is permitted on Sundays or Holidays unless authorized by the City. Existing roadways shall not be restricted between 7 & 9 AM and 3 & 6 PM unless approved by the City Engineer.

The definition of "Work" also includes the starting of equipment and the delivery of materials to the job site.

02205.2 INSPECTION AND HANDLING –Watermain Installation

Proper and adequate implements, tools, and facilities satisfactory to the City Engineer or a designee shall be provided and used by the Contractor for the safe and convenient prosecution of the work. During the process of unloading, all pipe and accessories shall be inspected by the Contractor for damage. The Contractor shall notify the City Engineer or a designee of all material found to have cracks, flaws or other defects. The City Engineer or a designee shall inspect the damaged materials and have the right to reject any materials found to be unsatisfactory. The Contractor shall promptly remove all rejected material from the site. All materials shall be handled carefully, so as to prevent damage to protective coatings, linings, and joint fillings; preclude contamination of interior areas; and avoid jolting contact, dropping, or dumping.

All work and materials are subject to tests by the Owner at such frequency as may be determined by the City Engineer or a designee.

While suspended and before being lowered into laying position, each pipe section and appurtenant unit shall be inspected by the Contractor to detect damage or unsound conditions that may need corrective action or be cause for rejection. The Contractor shall inform the City Engineer or a designee of any defects discovered and the City Engineer or a designee will prescribe the required corrective actions or order rejection.

Immediately before placement, the joint surfaces of each pipe section and fitting shall be inspected for the presence of foreign matter, coating blisters, rough edges or projections, and any imperfections so detected shall be corrected by cleaning, trimming, or repair as needed.

02205.3 INSTALLATION OF PIPE AND FITTINGS –Watermain

Installation

All site grading must be completed, certified by the project Engineer and all "Off Road" grading equipment removed from the site before starting any public utility work.

Watermain and water services shall be placed with a minimum of 7.5 feet of ground cover from the top of pipe to finished grade.

Hydrants shall not be installed on the same side of the street as the sidewalk or trail.

If an existing property's service is to be interrupted notify the property owner 48 hours in advance. Interruption of existing service shall be confined to between the hours of 9 AM and 4 PM.

Water services shall be extended from the main to the back of the 10-foot easement where the curb stop will be placed. Minimum size of service is 1" O.D. A 1½" O.D. or larger diameter service shall be installed where fire sprinklers are required or design dictates. See Standard Detail Plate [W-1](#).

Installation of Polyethylene Pipe (HDPE) and their appurtenances shall conform to the requirements of AWWA C906. The installation shall be to the bedding and backfill conditions specified by the Manufacturer, Plans, Specifications, or Special Provisions.

AWWA C900, C905 and C909 pipe should be installed in accordance with AWWA C605 "Underground Installation of Polyvinyl Chloride (PVC) Pressure Pipe and Fittings for Water." The installation shall be to the bedding and backfill conditions specified by the Plans, Specifications, or Special Provisions.

Installation of ductile iron water mains (DIP) and their appurtenances shall conform to the requirements of AWWA C-600 Specifications, the Plans, Specifications and Special Provisions.

In low-pressure areas, above elevation 1040 feet above sea level, the City will require pressure booster pumps within the structure at the service entrance. The City's Building Division codes shall apply for this requirement.

02205.4 PIPE LAYING OPERATIONS –Watermain Installation

Trench excavation and bedding preparations shall proceed ahead of pipe placement so as to permit proper placement and joining of the pipe and fittings at the prescribed grade and alignment without unnecessary hindrance. All foreign matter or dirt shall be removed from the inside of the pipe and fittings before they are lowered into position in the trench, and they shall be kept clean by approved means during and after the laying operation. The water main materials shall be carefully lowered into laying position by the use of suitable restraining devices. Under no circumstances shall the pipe be dropped or dumped into the trench.

Placement of public PVC or H.D.P.E pipe shall not occur after November 30th or before March 31st.

At the time of pipe placement, the bedding conditions shall be such as to provide uniform and continuous support for the pipe between bell holes. Bell holes shall be excavated as necessary to make the joint connections, but they shall be no larger than would be adequate to support the pipe throughout its length.

No pipe material shall be laid in water or when the trench or bedding conditions are otherwise unsuitable or improper. Maintain a minimum 24" of separation between the watermain and all other utility pipes.

When placement or handling precautions prove inadequate, in the City Engineer or a designee's, opinion, the Contractor shall provide and install suitable plugs or caps, effectively closing the open ends of each pipe section before it is lowered into laying position, and they shall remain so covered until removal is necessary for connection of an adjoining unit.

Tracer wire shall be placed along the side of the pipe and secured every 10 feet to the pipe with duct tape. Tracer wire shall be brought up inside each valve box, except hydrant valve boxes and up alongside each hydrant barrel. The tracer wire to the hydrant shall be run inside a 3' long section of 1" PE water service pipe from the terminus on the hydrant, down two feet into the soil. Tracer wire shall be installed up the inside of all main line valve boxes. See details [W2](#) and [W4](#) for additional information.

As each length of bell and spigot pipe is placed in laying position, the spigot end shall be centered in the bell and the pipe forced home and brought to correct line and grade. The pipe shall be secured in place with approved backfill material, which shall be thoroughly compacted by tamping around the pipe to a height of at least 12 inches above its top. Mechanically compact all trenches in accordance with [MnDOT 2105](#).

At all times when pipe laying is not in progress, including noon hour and overnight periods, all open ends of the pipe line shall be closed by watertight plugs or other means approved by the City Engineer or a designee. If water is present in the trench, the seals shall remain in place until the trench is pumped completely dry.

When connecting to existing stubs, the Contractor shall take every precaution necessary to prevent dirt or debris from entering the existing lines. All necessary work to make the connection shall be done at no additional compensation, except where noted otherwise.

02205.5 GATE VALVES, BOXES, VALVE BOX BASES AND VALVE BOX CLIPS –Watermain Installation

All gate valves, except for those on hydrant leads, shall have a tracer wire loop run up the inside of the box and terminated just under the box cover. "Vait Products" gate valve box tracer wire clips or approved equal shall be used inside of the valve box to secure the tracer wire. Box bases shall be placed on "Adaptors Inc." #6 valve box adaptor base or approved equal. Valve boxes shall be installed plumb and square to the valve operating nut. All off road valve boxes, except for those on hydrant leads, shall be marked with a flange post and a blue reflectorized metal marker plate with white "G.V." lettering printed upon the plate. Marker plate shall be attached to the flange post using stainless steel bolts and nuts. The marker plate shall face the closest access road. The flange post shall be located 2' behind the box when facing the roadway.

02205.6 Jacking/Boring – Watermain Installation

The terms "auger", "boring", "jack", "jacking", and "tunneling" in the proposal, specifications, and plans refers only to non-open cut construction. The Contractor shall inspect and verify soil conditions to his own satisfaction in order to determine

the type of construction to employ. During the construction, the Contractor shall be responsible for protecting all existing utilities above or below the pipe invert.

The minimum inside diameter of the casing pipe shall be four (4) inches greater than the outside diameter of the bell of the carrier pipe. For any installation beneath a railroad, the top of the casing pipe shall not be closer than the specified dimensions indicated in the railroad permit.

The steel casing minimum wall thickness shall be as specified on the Plans, in the Special Provisions, or in the applicable Permit. Where required by the City Engineer or a designee, two 17-pound anode packs shall be attached to the casing for corrosion protection.

A 1-1/2 inch pipe shall be forced along the top of the casing pipe. The front end of this pipe shall be 18 inches behind the front end of the casing pipe. A mixture of water and bentonite clay shall be forced through this pipe at all times during the casing installation to fill any voids that may be present above the casing pipe. Upon completion of the casing installation, this pipe shall be slowly withdrawn while bentonite is forced through the pipe to fill any remaining voids.

The Contractor shall prevent excavated materials from flowing back into the excavation during the non-open cut construction. This shall include the use of a shield conforming to the size and shape of the casing that will prevent materials from flowing into the leading edge of the casing. The jacking machine used shall be capable of controlling line and grade and shall conform to the size and shape of the casing pipe.

No jacking/auguring of pipe will be allowed below the water table unless the water table has been lowered sufficiently to keep the water below the pipe being installed. The use of water under pressure (jetting) or puddling will not be permitted to facilitate jacking/auguring operations.

If any installation is augured, the head shall be approved by the City Engineer or a designee and the auger shall be located six (6) inches behind the lead edge of the casing or carrier pipe.

If a void develops, the jacking/auguring shall be stopped immediately and the void shall be filled by pressure grouting. The grout material shall consist of a sand/cement slurry of at least two sacks of cement per cubic yard and a minimum of water to assure satisfactory placement.

Skids and blocking shall be used as necessary to install the carrier pipe to the proper line and grade inside the casing pipe. Voids between carrier and casing pipes shall be filled with sand and the casing pipe sealed at both ends with a suitable material to prevent water or debris from entering the casing pipe.

02205.7 HORIZONTAL DIRECTIONAL BORING –Watermain Installation

Directional boring/drilling installation shall be accomplished where required on the Plans or in the Special Conditions to minimize disturbance of existing surface improvements. The Contractor shall be compensated for the restoration work only within the areas at the connection points, or other locations as may be approved by the City Engineer or a designee. The Contractor shall be responsible for repairs,

without compensation, for any other repair areas, including pit/boring points and areas above the drilled pipe where underground pressure may cause heaving or damage to pavement and ground surfaces.

The contractor must submit boring/drilling pit locations to the City Engineer or a designee for approval before beginning construction. Boring pits may be located within roadway right-of-way and easements as authorized by the City of Plymouth. Any other locations that may be desired by the contractor for boring pits or other uses shall be the responsibility of the Contractor to attain authorization, including private property as may be required.

The drilling equipment shall be capable of placing the pipe as shown on the plans. The installation shall be by a steerable drilling tool capable of installing continuous runs of pipe without intermediate pits, at a minimum distance and radius requirements per the manufacturer's specification and recommendations. The guidance system shall be capable of installing pipe within 6-inches of the plan vertical dimensions and 12-inches of the plan horizontal dimensions. The Contractor shall be required to remove and reinstall pipe, which vary in depth and alignment from these tolerances.

Copperhead Industries 7x7 Stranded Copper Clad Steel break load 4700 # minimum, tracer wire or approved equal shall be pulled along with the HDPE pipe in order to locate it in the future. Conductivity between HDPE and ductile iron pipe shall be continuous.

Pull back forces shall not exceed the allowable pulling forces for the pipe being installed. The minimum radius of the pipe shall be per the manufacturer's specification and recommendations. Drilling fluid shall be a mixture of water and bentonite clay and shall be designed for existing soil conditions. Disposal of excess fluid and spoils shall be the responsibility of the Contractor.

02205.8 POLYETHYLENE ENCASEMENT OF PIPELINE –Watermain Installation

For DIP watermain wherever so required by the Plans, Specifications, or Special Provisions, the pipeline, including valves, fittings, hydrant barrels, and appurtenances, shall be fully encased in polyethylene film meeting the requirements of these Specifications. The film shall be furnished in tube form for installation on pipe and all pipe-shaped appurtenances such as bends, reducers, off-sets, etc. Sheet film shall be provided and used for encasing all odd-shaped appurtenances such as valves, tees, crosses, etc.

02205.9 REACTION BACKING –Watermain Installation

Reaction backing shall be provided at all watermain fittings and at the hydrant in accordance with the typical backing detail shown on the standard details. In any instance where the City Engineer or a designee determines that solid backing against undisturbed earth is not obtainable for fittings or hydrants, the Contractor shall use stainless steel tie rods, ASTM F 593 Type 304 and or mechanical joint retainer glands as directed by the City Engineer or a designee. All vertical bends shall be secured with both mechanical joint retainer glands and two (2) stainless steel tie rods. Mechanical joint retainer glands shall be tied to an adjacent fitting or back one full length of pipe. Bends larger than 45 degrees shall not be used without approval of the City Engineer or a designee.

02205.10 JOINING OF HDPE PIPE –Watermain Installation

Sections of polyethylene pipe shall be joined by the butt fusion process into continuous lengths at the job site. Extrusion welding or hot gas welding of HDPE shall not be used. Butt fusion shall be performed only by a certified thermal fusion Contractor. The Contractor's certification shall be submitted to the City Engineer or a designee for review and approval prior to the start of construction. The joining method shall be the butt fusion method and shall be performed in strict accordance with the pipe manufacture's recommendations. The butt fusion equipment used in the joining procedures should be capable of meeting all conditions recommended by the pipe manufacturer. The Contractor shall be responsible to verify that the fusion equipment is in good operating condition and that the operator has been trained within the past twelve months. All welds will be made using a Data Logger to record temperature, fusion pressure, with a graphic representation of the fusion cycle shall be part of the Quality Control records.

Flanges/MJ adapters shall be attached to pipe fittings using butt fusion. The flanges/MJ adapters shall be aligned and centered relative to the pipe. Flanges/MJ adapters should be square with the valve or other flange before tightening of bolts. Bolts should not be used to draw flanges into alignment. Bolt threads shall be lubricated, and flat washers shall be used under flange nuts. Bolts shall be tightened using a "star tightening pattern". See manufacturer's recommendations. Twenty-four hours after first tightening the flange bolts, they must be re-tightened using the same "star tightening pattern" used above. The final tightening torque shall be as indicated by the manufacturer.

Polyethylene pipe and fittings may be joined using approved electro fusion couplings where the butt fusion method cannot be used. Fittings shall be PE3408 HDPE, Cell Classification of 345464C as determined by ASTM D3350-99. Electro fusion Fittings shall have a manufacturing standard of ASTM F1055. Fittings shall have a pressure rating equal to the pipe unless otherwise specified on the plans. All electro fusion fittings shall be suitable for use as pressure conduits, and per AWWA C906, have nominal burst values of three and one-half times the Working Pressure Rating (WPR) of the fitting.

Mechanical joining may be used where the butt fusion or electro fusion methods cannot be used. Mechanical joining will be accomplished by either using a HDPE flange adapter with Ductile Iron back-up ring or HDPE Mechanical Joint adapter with a Ductile Iron back-up ring. Refer to the manufacturer's recommendations. Pipe stiffeners shall be used where stiffening of the pipe is necessary for proper gasket seal. Pipe Stiffeners shall be ASTM-240-TP-304 Stainless Steel.

02205.11 REMOVE AND REPLACE WATERMAIN BOLTS

- .A Replace watermain bolts with ASTM F 593 Type 304 stainless steel bolts while watermain is live. Replace only one bolt at a time. Apply anti-seize on stainless steel bolts.
- .B Replace top plate bolts first with valve pinched wide open. Typically there are 4 top plate bolts per valve.
- .C Replace the bolt inside of the top nut.
- .D Replace bonnet bolts second with valve pinched wide open. There are approximately 12 bolts per valve.
- .E Remove bolts by using a vice grip or impact wrench.
- .F After replacing bolts, shut off valve completely to test for leaks. If leaks occur, open valve and tighten bolts.

- .G Apply automotive under coating to test plug when valve is dry. Wait 20 minutes for coating to dry before backfilling.
- .H Excavation and backfilling are included in the bid price.

02205.12 ADJUST GATE VALVE BOX

Includes adjusting casting to appropriate base course elevation and then to appropriate finished elevation. Adjustment to finished elevation shall be performed using risers for extensions of gate valves as outlined in City of Plymouth Standard Detail Plate STRT-28. No payment will be made for additional adjustments.

02205.13 WATERMAIN STUBS PRESSURE RELIEVE PROVISION

All mainline watermain stubs shall have a provision to relieve residual pressure for when the line is extended in the future. The method may be either installation of a standard hydrant assembly at the end of the stub or an end cap on the stub with a corporation stop installed, 1" P.E. service pipe, curb stop with box and a length of P.E. service pipe terminating above ground. This will be considered incidental to the watermain installation.

02206 WATERMAIN TESTING

In order to assure quality materials and workmanship, the following tests shall be required unless waived by the City Engineer or a designee. The City Engineer or designee shall be present for all tests and shall be notified at least 48 hours in advance of the specific test by calling (763) 509-5500. Testing shall be completed after all the utility pipes have been installed in the area to be tested and prior to commencement of the street construction.

All tests shall be in accordance with CEAM standards or what is required within this specification. Individuals qualified to perform and evaluate such tests shall do all testing. The Contractor shall pay for all tests required in these guidelines. Copies of the results shall be submitted to the City Engineering Division.

02206.1 PRESSURE TESTING OF WATERMAIN

Pressure test of the watermain shall be run at 150 psi for 2 hours with 0 (zero) pounds allowable pressure loss during the first hour and no more than 2 pounds allowable pressure loss during the second hour. Gauge to be used will be an [Ashcroft, Model 1082](#), 4½" diameter in one psi increments or approved equal. Water lines shall be segmented using the installed valves to limit the maximum test segment length to 1,200 feet.

02206.2 CONDUCTIVITY TESTING OF WATERMAIN

Conductivity testing of DIP watermain, copper straps or copper tipped gaskets shall be required to run at 350 amps for 5 minutes. PVC/HDPE watermain tracer lines shall be tested using a standard underground utility locator, demonstrating that the lines can be located. Welders may not be used on tracer wire locating/conductivity testing.

02206.3 DISINFECTION OF WATERMAIN

Disinfect pipe lines prior to placing watermain in service in accordance with AWWA C651. The watermain initial fill shall be done by City personnel. The watermain initial fill shall sit in the pipe a minimum of 24 hours before flushing for the bacteria test.

02206.4 BACTERIA TESTING OF WATERMAIN

The watermain shall be flushed, in the presence of City personnel, of its concentrated chlorine from the initial filling and then shall sit for 24 hours prior to sampling for bacteria. The contractor shall have water samples taken in the presence of City personnel and analyzed by a certified laboratory. The laboratory's field technician shall collect the samples. A copy of the tests results must be sent to the City Engineer for the project records. The report must contain the project name and the location where the sample was taken, the parts per million (PPM) of chlorine for each sample must fall between the EPA minimum of Mg/L of 0.20 ppm and a maximum of Mg/L of 4.0 ppm, as well as whether they pass or fail. City crews will perform a final flush of the mains and place them in service after successful testing of the system.

02207 MEASUREMENT AND PAYMENT

All items will be measured separately according to design designation as indicated in the Pay Item name and as may be detailed and defined in the Plans, Specifications, or Special Provisions. Pipe will generally be designated by size (inside diameter or span), strength class, kind or type, and laying condition.

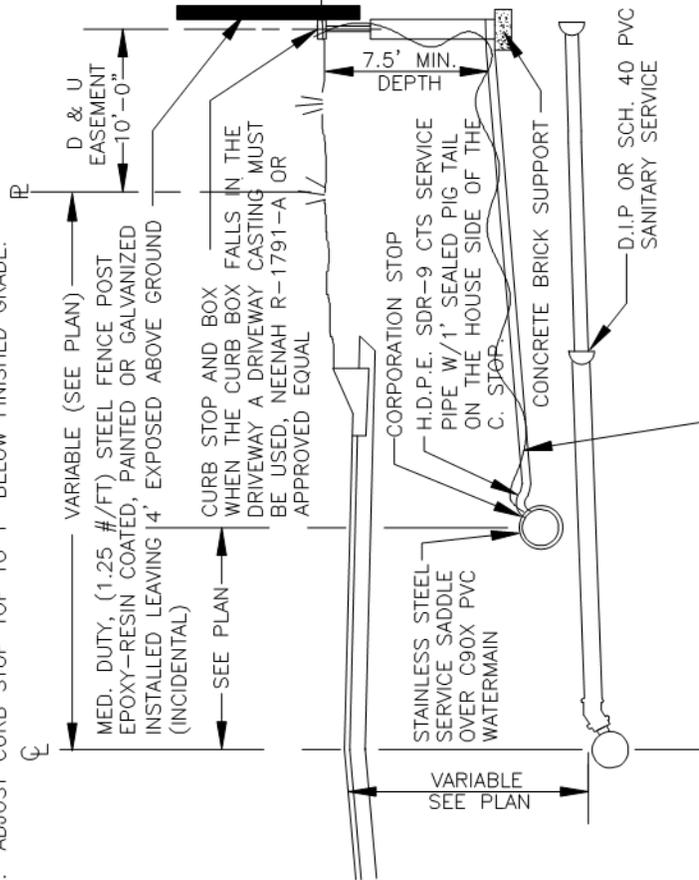
Complete-in-place items shall include all component parts thereof as described or required to complete the unit, but excluding any excesses covered by separate Pay Items. Linear measurement of piping will include the running length of any special fittings (tees, bends, gates, etc.) installed within the line of measure between specified terminal points.

02208 WATERMAIN DETAILS PLATES

W-1 through W-6

NOTES:

1. HDPE SERVICE PIPE IS TO BE A CONTINUOUS PIECE. NO JOINTS, COUPLINGS, ETC., ALLOWED FROM THE MAIN TO THE CURB STOP.
2. HDPE WATER SERVICE TO HAVE A LOOP TO PROVIDE FOR SETTLEMENT.
3. CAP OR PIG TAIL HOUSE SIDE OF THE CURB STOP TO KEEP CLEAN
4. INSERT STIFFENERS REQUIRED ON ALL FLEXIBLE PLASTIC CONNECTIONS.
5. A STATIONARY ROD IS REQUIRED FOR ALL CURB STOPS.
6. SWING TIES ARE REQUIRED FOR WATER SERVICES.
7. ADJUST CURB STOP TOP TO 1" BELOW FINISHED GRADE.



CAPS

McDONALD 5614-L
 MUELLER 89375
 FORD TYPE PS-LID

MINNEAPOLIS PATTERN CURB STOP

BOXES W/7-1/2' RODS

McDONALD 5614 (1" SVC)
 McDONALD 5615 (1 1/2" SVC)
 MUELLER H-10300 (1" SVC)
 MUELLER H-10300-9902 (1 1/2" SVC)
 FORD EM2-75-46-72R (1" SVC)
 FORD EM2-75-47-72R (1 1/2" SVC)

CURB STOPS (BALL VALVE)

MINNEAPOLIS PATTERN

McDONALD-6104-22 (1" -1 1/2")
 MUELLER-B25155 (1" -1 1/2")
 FORD-B44-444M-G (1")
 FORD-B44-666M-G (1 1/2")

CORPORATION STOPS

WITH COMPRESSION FITTINGS AND BALL VALVES

McDONALD 4701-22 (1" -1 1/2' SVC)
 MULLER P-25028 (1" -1 1/2" SVC)
 FORD FB1000-4-G (1" SVC)
 FORD FB1000-6-G (1 1/2" SVC)

STAINLESS STEEL SERVICE SADDLES

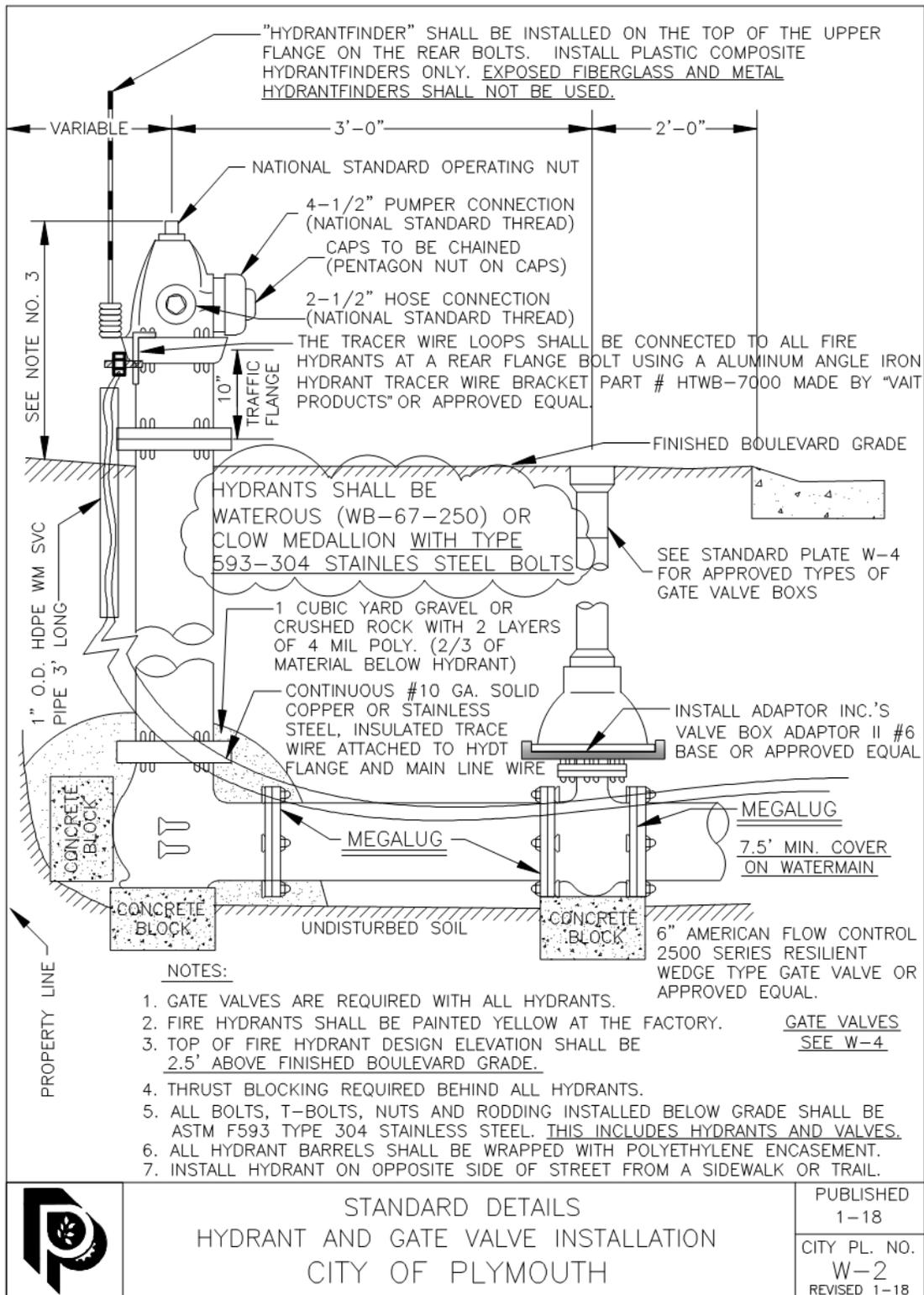
SMITH-BLAIR 372
 FORD FS-313
 ROMAC 306 AND 305



STANDARD DETAILS
 SEWER AND WATER SERVICE CONNECTION
 CITY OF PLYMOUTH

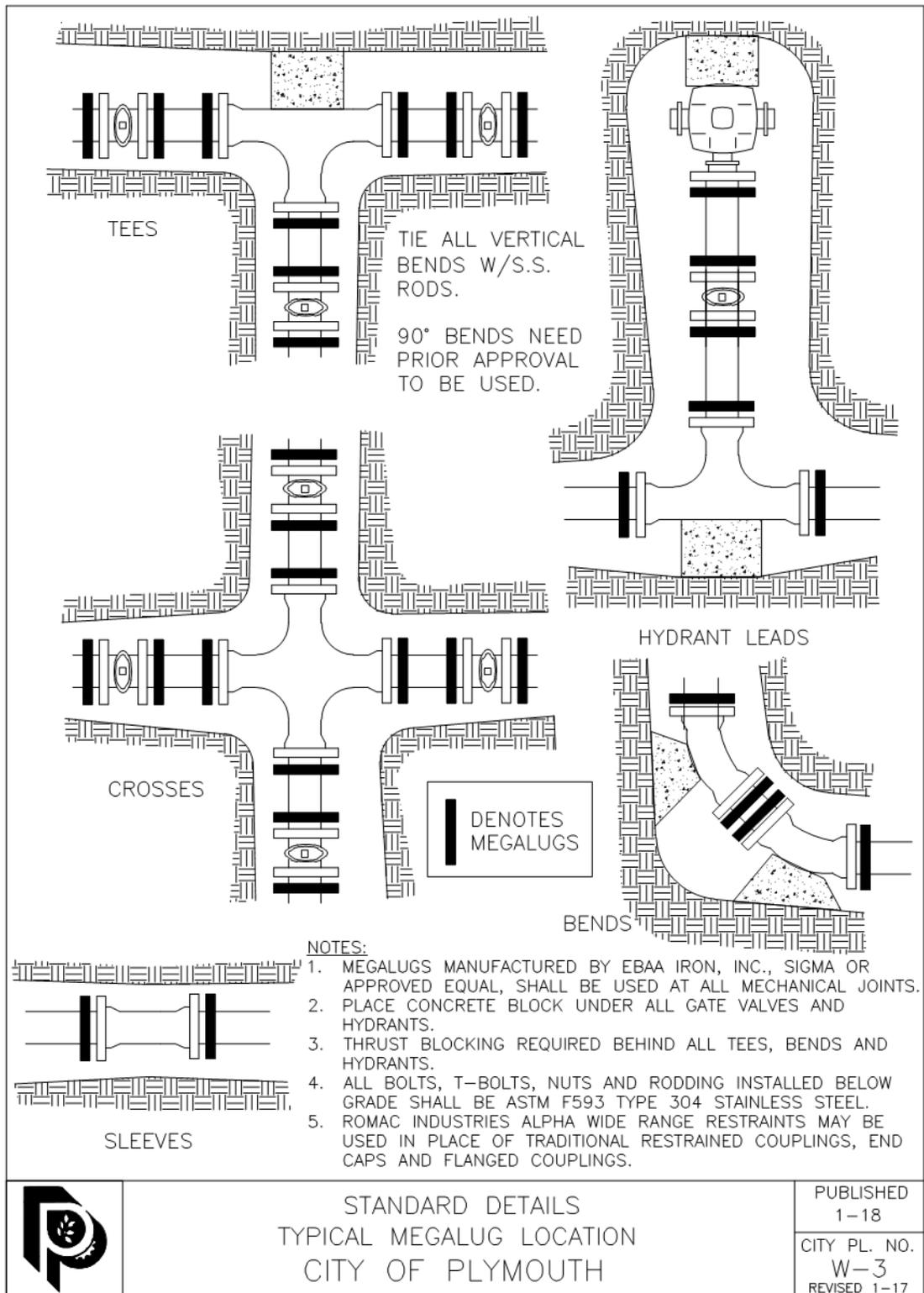
PUBLISHED
 1-18

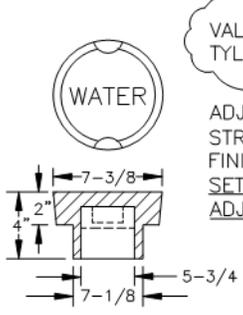
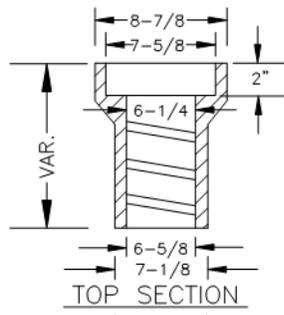
CITY PL. NO.
 W-1
 REVISED 1-17



STANDARD DETAILS
HYDRANT AND GATE VALVE INSTALLATION
CITY OF PLYMOUTH

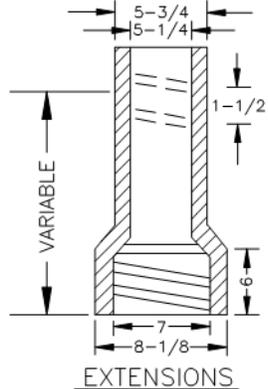
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CITY PL. NO.
W-2
REVISED 1-18





VALVE BOX COVERS SHALL BE:
TYLER 6865 OR BIBBY B-516C

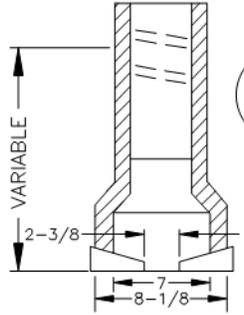
ADJUST V.B. TOP TO 1/4" TO 1/2" BELOW STREET GRADE OR 1/2" TO 1" BELOW FINISHED BLVD. GRADE AND SHALL BE SET SO AS TO PROVIDE 12" OF UPWARD ADJUSTMENT.



14" MIN. FROM TOP OF BOTTOM SECTION TO TOP OF VALVE BOX

GATE VALVE BOXES:
TYLER PIPE - SERIES 6860 SCREW TYPE WITH A #6 BASE AND DROP LIDS WITH "WATER" LABELED ON COVER
BIBBY - SERIES STC B5001 CREW TYPE WITH A #6 BASE AND DROP LIDS WITH "WATER" LABELED ON COVER OR APPROVED EQUAL

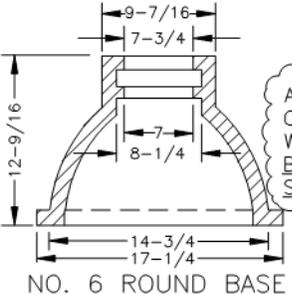
NO TRACER WIRE NEED FOR THE VALVE BOXES UNLESS OTHERWISE DIRECTED



INSTALL ADAPTOR INC.'S VALVE BOX ADAPTOR II #6 BASE OR APPROVED EQUAL

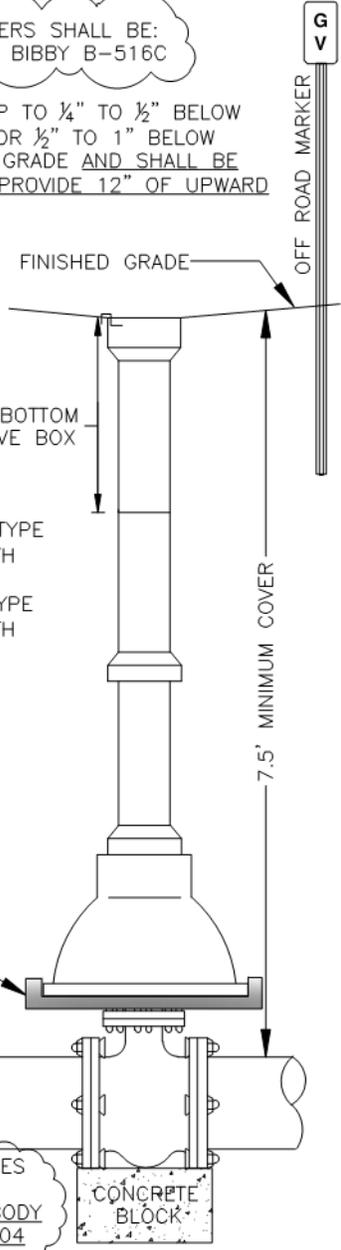
MIDDLE SECTION

GATE VALVE BOXES ARE 3 PIECE, 5-1/4" SHAFT



GATE VALVES
AMERICAN FLOW CONTROL 2500 SERIES OR MULLER 2360 SERIES RESILIENT WEDGE TYPE GATE VALVES. VALVE BODY BOLTS SHALL BE ASTM F593 TYPE 304 STAINLESS STEEL.

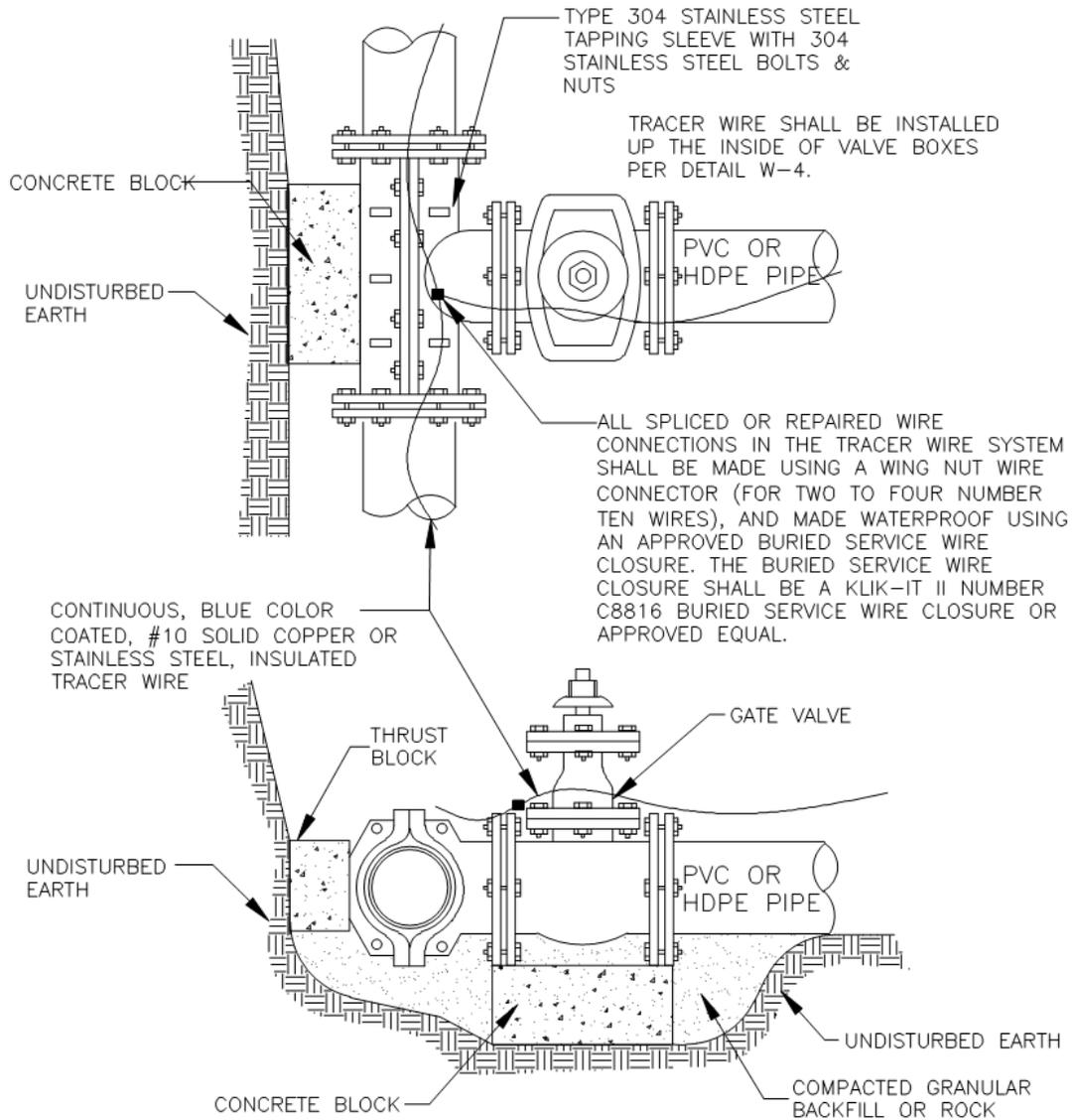
NOTE: ALL BOLTS, T-BOLTS, NUTS AND RODDING INSTALLED BELOW GRADE SHALL BE ASTM F593 TYPE 304 STAINLESS STEEL.



STANDARD DETAILS
GATE VALVE AND BOX INSTALLATION
CITY OF PLYMOUTH

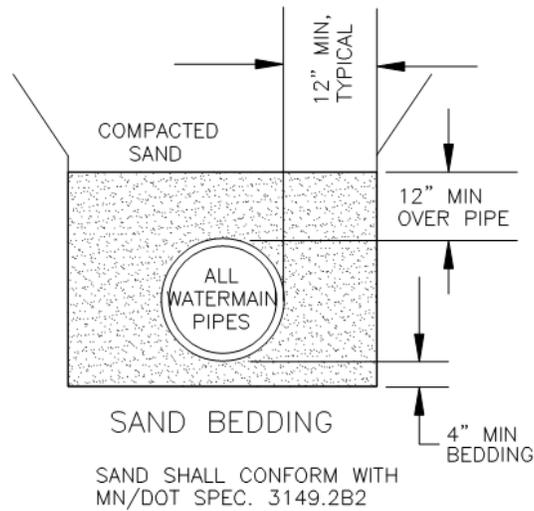
PUBLISHED
1-18
CITY PL. NO.
W-4
REVISED 1-18

NOTE: ALL BOLTS, T-BOLTS, NUTS AND RODDING INSTALLED BELOW GRADE SHALL BE ASTM F593 TYPE 304 STAINLESS STEEL. EACH BOLT SHALL BE CLEARLY STAMPED AS A 304 STAINLESS STEEL BOLT. (THIS INCLUDES ALL VALVE AND SLEEVE BODY HARDWARE)

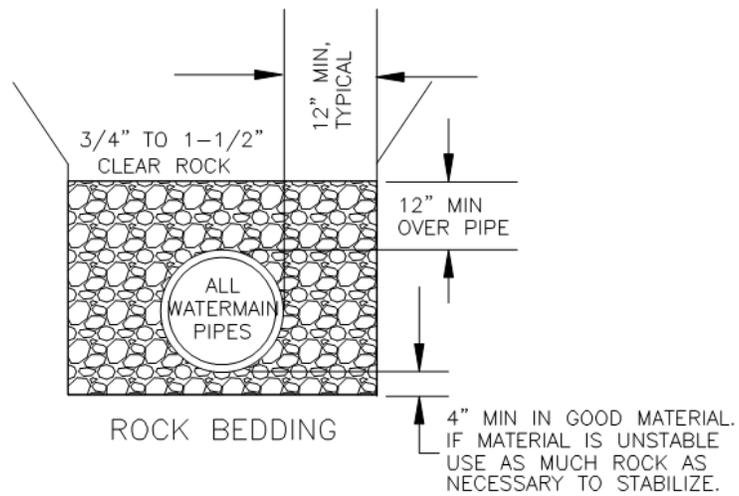


STANDARD DETAILS
WATERMAIN WET TAP
CITY OF PLYMOUTH

PUBLISHED
1-18
CITY PL. NO.
W-5
REVISED 1-17



NOTE:
BEDDING SHALL BE CONSIDERED INCIDENTAL TO THE PIPE UNLESS MODIFIED IN THE CONTRACT DOCUMENTS.



NOTE: WATERMAIN PIPE SHALL BE C900 OR C905 UNLESS OTHERWISE NOTED.



STANDARD DETAILS
WATERMAIN BEDDING
CITY OF PLYMOUTH

PUBLISHED
1-18

CITY PL. NO.
W-6
REVISED 1-17



**STANDARD SPECIFICATIONS
FOR
STORM SEWER CONSTRUCTION
CITY OF PLYMOUTH, MINNESOTA**

JANUARY 2018

ENGINEERING DIVISION

3400 PLYMOUTH BLVD.
PLYMOUTH, MN USA 55447-1482
TELEPHONE (763) 509-5500

A handwritten signature in black ink, appearing to read 'Jim Renneberg', is positioned above the printed name.

Jim Renneberg, P.E.
City Engineer

These specifications are intended for inclusion into the contract documents. They only address the technical specifications and construction details of the referenced section.

**SECTION 02300
STANDARD DETAIL SPECIFICATIONS
FOR
STORM SEWER CONSTRUCTION**

CITY OF PLYMOUTH, MINNESOTA USA

JANUARY 2018

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Print on Yellow Paper

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02301 SCOPE OF WORK

The work to be done under this contract shall include the furnishing of all labor, materials, tools and equipment to construct complete in place the storm sewer and all appurtenances as show on the drawings, plans and as specified herein.

The Contractor shall excavate all materials encountered, furnish and compact foundations where required, furnish and install all timbering, sheeting and bracing necessary to safely support the work, remove any ground water encountered during excavation operations, protect, repair, relocate, maintain and restore all sub-surface, surface and overhead structures directly disturbed, damaged or affected by construction operations and furnish all backfill and other appurtenant items as necessary.

All off road storm sewer manholes must be accessible to the city's maintenance vehicles. All manholes outside of the street and not in a maintained area shall be marked with a flange post and a green reflectorized metal maker plate with white "M.H." lettering printed upon the plate. The marker plate shall face the closest access road. The flange post shall be located approximately 2' behind the structure when facing the roadway.

All existing drainage features in and around a new project and utilized by the project such as existing pipes and ditches that will remain in service after the project completion shall be in good condition at the completion of the project. If these existing drainage features are not in good condition they will need to be cleaned or replaced to condition that allows them to function as required to accommodate the new runoff conditions from the project.

02302 SPECIFICATIONS WHICH APPLY

All specifications contained herein, including attached detail drawings, together with the construction plans for the designated project or projects and including current versions of those portions of the following specification, as indicated by paragraph or designation number, shall apply: American Society for Testing Materials ([ASTM](#)); American National Standards Institute ([ANSI](#)); Minnesota Department of Transportation "Standard Specifications for Construction" current addition including Special Provisions ([MnDOT](#)), and The "City Engineers Association of Minnesota", Standard Specifications for Utility Construction ([CEAM](#)).

02303 STORM SEWER MATERIALS

All storm sewer pipe, fittings, manholes and all appurtenances shall be new materials and shall be of the type, size, strength, and quality as shown on the plans or on the details and as specified herein and/or as indicated in the Special Provisions.

The contractor may be required to secure and deliver to the City Engineer or a designee, a written statement from the manufacturer assuring the quality and compliance to the applicable specification of all materials furnished and installed under this improvement project. This shall in no way relieve the Contractor of any responsibility as to the quality of materials furnished and installed.

No PVC, corrugated HDPE or corrugated metal pipe (CMP) shall be used for mainline storm sewer within the Public right-of-way unless previously approved by the City Engineer.

02303.1 REINFORCED CONCRETE PIPE –Storm Sewer Materials
Reinforced concrete pipe (RCP) shall meet the requirements of MnDOT Specification 3236 with class as required and shown on the plans; pipe joints shall meet the requirements of ASTM Specification C361, and shall be R-4 type joints.

02303.2 DRAIN TILE –Storm Sewer Materials

Drain tile pipes shall be 6" diameter, minimum SDR 35, rigid, perforated, with protective wrap meeting MnDOT 3733 specification. They shall be made from PVC meeting MnDOT [3245.2 \(3\)](#) specification. Solid copper #10, green coated tracer wire shall be installed along side of the draintile segments. See Standard Detail Plates [ST-9](#) and [ST-10](#).

.2A P.E. YARD DRAINS

- Shall be Tuf-Tite brand drain sump with a minimum of 4 connection openings or approved equal.
- A minimum of one outlet connection and three inlet connections are required for yard drains requiring 6" connections (as noted on the plans).
- Cover all openings not connected to drain tile with plugs manufactured for that purpose. Provide grate style cover.
- Fittings shall be manufactured specifically for the use required and compatible with other materials used.

02303.3 PIPE BEDDING MATERIALS –Storm Sewer Materials

Pipe bedding material shall be in accordance with Standard Detail Plate [ST-8](#) and [ST-10](#). The contractor shall provide Certification of the materials being used and will be required to perform field sampling for gradation test of any bedding materials used as required by the City Engineer. Copies of test results shall be submitted to the City in a timely manner. Bedding shall be considered incidental to the pipe installation unless noted otherwise in the contract documents.

02303.4 MANHOLES/CATCH BASINS –Storm Sewer Materials

Manholes, catch basins, and other special access structures shall be constructed at designated locations as required by the Plans and in accordance with any standard detail drawings or special design requirements given therefore. Manholes and catch basins shall meet the requirements of A.S.T.M. Specification C-478. Sumps may be required at certain points.

Precast boxes and sections shall be used wherever possible. Block construction of a structure requires prior approval of the City Engineer or a designee, and must be shown on the approved plans. See Standard Detail Plate [ST-2](#).

Barrel and cone/slab height shall be such as to permit placement of at least two and not more than six, two-inch thick, HDPE adjusting rings immediately below the casting assembly. Manholes/catch basins shall be in accordance with MnDOT Specification 3622, and have a minimum diameter of 4'. Catch Basins shall be either 4' diameter or 27" diameter for use in green areas or 2' x 3' precast concrete structures. See Standard Detail Plates [ST-1](#), [ST-2](#), [ST-6](#), [ST-7](#) and [ST-8](#).

Subgrade drains are required at all low point catch basins and on the uphill side of all in-grade catch basins. See Standard Detail Plate [ST-9](#).

02303.5 STANDARD SKIMMER STRUCTURE –Storm Sewer Materials

Skimmer structures shall be constructed at designated locations as required by the Plans and in accordance with any standard detail drawings or special design requirements given therefore. Skimmer structures shall meet the construction requirements of A.S.T.M. Specification C-478 for precast manholes. The minimum inside diameter of the structure shall be 48 inches and the maximum shall not exceed 72 inches. The structures top shall be constructed to match the slope of

the pond banks where it is installed. The top of the structure shall be covered with a galvanized metal, circular, 4" X 4" open grate, hinged split-grate. This grate shall be bolted down to the structure at a minimum of four equally spaced points around its perimeter.

Reinforced concrete pipe (RCP) or ductile iron pipe (DIP) shall be used for the inlet pipe with no apron installed if the pipe will be under water.

Reinforced concrete pipe (RCP) shall be used for the outlet pipe from the skimmer structure. All pipe joints on both the inlets and outlets shall be restrained. See Standard Detail Plate [ST-15](#) for standard skimmer structure details.

02303.6 MANHOLE/CATCH BASIN CASTINGS –Storm Sewer Materials
Manhole castings shall be Neenah R-1642-B or approved equal with machine bearing surfaces, with two concealed pick holes and "Storm Sewer" stamped on the cover. Catch basin castings shall be Neenah R-3067 with type V grates. Other acceptable catch basin castings depending upon the circumstances and subject to City approval are:

Neenah	R-2561-A	Round Beehive Grate & Casting
Neenah	R-2573	Round Concave Grate & Casting
Neenah	R-2577	Round Convex Grate & Casting
Neenah	R-3250-1	Round Curb Inlet Frame, Grate & Curb Box
Neenah	R-3501-TR or TL	Inlet for Roll Type Curb
Neenah	R-4342	Round Low Stool Type w/Conc. Frame per MNDOT STD. Plate # 4143E

02303.7 MANHOLE/CATCH BASIN ADJUSTING RINGS –Storm Sewer Materials

Manhole/catch basin adjusting rings shall be High Density Polyethylene Extruded (HDPE) produced by Ladtech or an approved equal. The rings shall provide a minimum adjustment of 4" using 2" rings and maximum adjustment of 12" with a 6" thick ring used for adjustments of 8" or greater. Joints between structure, rings and casting shall be sealed per the standard details with a Butyl caulk and wrapped with non-woven fabric for the catch basin rings. Solid reinforced concrete adjusting rings may be used in special situations only with **prior** written approval by the City Engineer. See Standard Detail Plate [ST-1](#), [ST-2](#) & [ST-6](#).

02303.8 FLARED END SECTIONS & POND EOF's/RIPRAP –Storm Sewer Materials

Flared end sections are required on all culverts. They are not allowed on the inlet pipe for a skimmer structure. All flared end sections 24" in diameter and larger shall be equipped with trash guards with an opening at the bottom of the trash guard (See Standard Detail Plate [ST-3](#)). Riprap and or energy dissipaters shall be required for all sizes to prevent erosion. Riprap will also be required at pipe inlets and pond emergency over flows (EOF's). Riprap, per [MnDOT specification 3601](#) shall be constructed using granite, 1' in diameter or larger and shall be hand placed. Non-woven geotextile fabric conforming to MnDOT specification [3733](#) shall be required under the riprap. See Standard Detail Plate [ST-4](#). Cable concrete (articulating concrete block mats) can be used instead of rip-rap.

02303.9 MORTAR –Storm Sewer Materials

Mortar for use in masonry construction shall be an air-entrained mixture of one part masonry cement, Type M, and two parts mortar sand, with sufficient water to produce proper consistency, and with sufficient air-entraining agent added to

maintain an air content within the range of 7 to 10 percent. Mortar shall meet the requirements of ASTM C-270.

02303.10 CHANNEL POSTS & MARKERS -Storm Sewer Materials

U-Channel post used for structure marking shall be green, 6ft in length weighting 3lb/ft. and punched full length with 3/8" diameter holes 1" on center. Marker signs shall be 0.063" thick aluminum blanks measuring 3" wide by 8" high with a high intensity green reflectorized background with white 2" high letters. Markers shall be attached to the post with two stainless steel bolts and nuts. Posts and markers shall be considered incidental unless otherwise noted.

02304 STORM SEWER INSTALLATION

02304.1 WORKING HOURS –Storm Sewer Installation

The City Engineer or a designee shall be notified at least 48 hours prior to commencing any work. Phone # (763) 509-5500. Contractors are subject to being shut down and or having work rejected if proper notification is not given to the City.

Work shall not commence before 7:00 a.m. nor extend beyond sundown Monday through Friday. On Saturdays, work hours are from 8:00 a.m. to 6:00 p.m. No work is permitted on Sundays or Holidays unless authorized by the City. Existing roadways shall not be restricted between 7 & 9 AM and 3 & 6 PM unless approved by the City Engineer.

The definition of "Work" also includes the starting of equipment and the delivery of materials to the job site.

02304.2 INSPECTION AND HANDLING –Storm Sewer Installation

Proper and adequate implements, tools, and facilities satisfactory to the City Engineer or a designee, shall be provided and used by the Contractor for the safe and convenient prosecution of the work. During the process of unloading, all pipe and accessories shall be inspected by the Contractor for damage. The Contractor shall notify the City Engineer or a designee, of all material found to have cracks, flaws or other defects. The City Engineer or a designee shall inspect the damaged materials and have the right to reject any materials found to be unsatisfactory. The Contractor shall promptly remove all rejected material from the site. All materials shall be handled carefully, as will prevent damage to protective coatings, linings, and joint fillings; preclude contamination of interior areas; and avoid jolting contact, dropping, or dumping. All work and materials are subject to tests by the Owner at such frequency as may be determined by the City Engineer or a designee.

While suspended and before being lowered into laying position, each pipe section and appurtenant unit shall be inspected by the Contractor to detect damage or unsound conditions that may need corrective action or be cause for rejection. The Contractor shall inform the City Engineer or a designee, of any defects discovered and the City Engineer or a designee will prescribe the required corrective actions or order rejection. Immediately before placement, the joint surfaces of each pipe section and fitting shall be inspected for the presence of foreign matter, coating blisters, rough edges or projections, and any imperfections so detected shall be corrected by cleaning, trimming, or repair as needed.

02304.3 PIPE LAYING OPERATIONS –Storm Sewer Installation

All site grading must be completed, certified by the project Engineer and all “Off Road” grading equipment removed from the site before starting any public utility work.

Trench excavation and bedding preparations shall proceed ahead of pipe placement as will permit proper placement and joining of the pipe and fittings at the prescribed grade and alignment without unnecessary hindrance. All foreign matter or dirt shall be removed from the inside of the pipe and fittings before they are lowered into position in the trench, and they shall be kept clean by approved means during and after laying. The storm sewer materials shall be carefully lowered into laying position by the use of suitable restraining devices. Under no circumstances shall the pipe be dropped or dumped into the trench.

At the time of pipe placement, the bedding conditions shall be such as to provide uniform and continuous support for the pipe between bell holes. Bell holes shall be excavated as necessary to make the joint connections, but they shall be no larger than would be adequate to support the pipe throughout its length.

No pipe material shall be laid in water or when the trench or bedding conditions are frozen or otherwise unsuitable or improper. Maintain existing drainage during construction in developed areas.

When placement or handling precautions prove inadequate, in the City Engineer's or a designee, opinion, the Contractor shall provide and install suitable plugs or caps effectively closing the open ends of each pipe section before it is lowered into laying position, and they shall remain so covered until removal is necessary for connection of an adjoining unit.

As each length of bell and spigot pipe is placed in laying position, the spigot end shall be centered in the bell and the pipe forced home and brought to correct line and grade. The pipe shall be secured in place with approved backfill material, which shall be thoroughly compacted by tamping around the pipe to a height of at least 12 inches above its top. Contractor shall mechanically compact trenches in accordance with MnDOT specifications [2105](#).

At all times when pipe laying is not in progress, including noon hour and overnight periods, all open ends of the pipe line shall be closed by watertight plugs or other means approved by the City Engineer or a designee. If water is present in the trench, the seals shall remain in-place until the trench is pumped completely dry.

When connecting to existing stubs, the Contractor shall take every precaution necessary to prevent dirt or debris from entering the existing lines. All necessary work to make the connection shall be done at no additional compensation, except where noted otherwise.

Granular material shall be placed under all storm sewer pipe or structures that are less than 48" below finished grade. The granular material shall extend to at least 48" below finished grade and taper up to the subgrade elevation at not steeper than a 10% slope.

Catch basin leads or storm sewers which cross the street in areas where soils are highly frost susceptible, shall be backfilled in accordance with the guidelines as are outlined in the MnDOT Road Design Manual Sections 8-6.01.08 and 8-6.01.09. A

drain tile pipe shall be placed in the bottom of the aggregate bedding trench, which shall drain into a catch basin structure. A Plate for this construction shall be included in the plans. In lieu of the MnDOT method, the City may consider an alternate design. The alternate design shall be reviewed and approved by the City Engineer or a designee.

See Standard Detail Plates [ST-9](#) and [ST-10](#) for location and construction of drain tile. Holes in structures for drain tile shall be either preformed or core drilled.

All functional storm sewer inlets shall be fitted with an appropriate sediment-trapping device in order to prevent sediment from entering storm sewer systems during construction. Storm drain inlet protection shall be in accordance with MnDOT 2573.3M.

02304.4 CONNECTION AND ASSEMBLY OF JOINTS –Storm Sewer Installation

All pipe and fitting joints shall fit tightly and be fully closed. Spigot ends shall be marked as necessary to indicate the point of complete closure. All joints shall be soil tight, as the minimum requirement, and shall be watertight in all storm sewer pipe lines installed within the limits of a paved street or highway traffic lanes. Where specified, the joints in certain assemblies shall be made structurally integral by being completely encased in concrete to form a rigid watertight unit as indicated in the standard drawings.

All joints shall be sealed as follows, subject to such other approved method as the City Engineer or a designee may authorize as being an acceptable alternative:

.4A Concrete pipe and fitting joints - compression type rubber gasket seals conforming to the requirements of ASTM C-443, ASTM C-361 or AASHTO M-198 for circular pipe, or as otherwise approved by the City Engineer or a designee, in the case of non-circular pipe sections.

.4B Tie the last 6 joints of both the inlet and outlet of flared end sections as well as all pipes in and out of a skimmer structure. See Standard Detail Plate [ST-3](#).

02304.5 RECONSTRUCT MANHOLES/CATCH BASINS –Storm Sewer Installation

Remove existing manhole or catch basin to the level directed by the engineer. Salvage and reinstall casting to the appropriate finished elevation. Reconstruct manhole or catch basin according to the plan and details. Provide 6" HDPE adjusting rings if structure will have 4 or 5 rings and 12" HDPE adjusting ring if there will be 6 or more rings. Provide new materials for any salvaged materials rejected for reinstallation by the Engineer. Backfill and patch roadway with aggregate base and bituminous to match existing section.

02304.6 REPAIR MANHOLE/CATCH BASIN –Storm Sewer Installation
Clean and fill all voids in the existing rings and structure and pipe connections with mortar. Restore inverts and benches with mortar.

02304.7 ADJUST CASTING

Adjust castings within 10 days after initial bituminous course placement. Keep excavation of adjustments to a minimum. Replace excavated areas in kind.

Replace or install all adjusting rings and set the top of casting to 1/2" below and parallel to the proposed roadway surface. Tapered rings shall be used to adjust the casting to match the street grade. If tapered rings do not provide sufficient adjustment, the Contractor may use a mortar bed placed between the structure and the first ring to provide additional adjustment with prior approval of the Engineer.

Set casting and each ring on inflow and infiltration barrier. Provide 6" P.E. adjusting ring if structure will have 4 or 5 rings and 12" P.E. adjusting ring if there will be 6 or more rings. Use two ring minimum and 12" maximum rings when setting castings.

02305 STORM SEWER TESTING REQUIREMENTS

In order to assure quality materials and workmanship, the following tests shall be required unless waived by the City Engineer or a designee. The City Engineer's designee shall be present for all tests of public utilities and shall be notified at least 48 hours in advance of the specific test by calling (763) 509-5500.

All testing to be completed and passed prior to beginning roadway work. Tests shall be in accordance with CEAM standards or what is required within this specification. Individuals qualified to perform and evaluate such tests shall do all testing. The contractor shall pay for all tests required in these guidelines. Copies of the results shall be submitted to the City Engineering Division.

02305.1 COMPACTION

Mechanically compact all trenches in accordance with MnDOT specification 2105.

02305.2 PIPE CLASS

Pipe strength class shall be stamped on the pipe and test results submitted indicating that this pipe meets strength requirements.

02305.3 TELEVISIONING OF PIPES

The storm sewer system, excluding drain tile lines shall be televised and the video reports along with a written report to be submitted to the City for review. Video reports can be submitted on CD-ROM, DVD compact disks or via the internet cloud services. All lines must be flushed and cleaned prior to televising. The video report will be used to view the condition of the storm sewer pipe prior to acceptance. Workmanship and cleanliness of the installation will be checked. If a line requires cleaning or repairs then that segment shall be re-televised afterwards and the new report will be submitted to the City for review. This shall be repeated at the contractor's expense, until that segment of the sewer line is clean and or repaired. Video reports shall become the property of the City and contain the following:

.3A Reference the start and end of each video segment as it begins, by clearly identifying the manhole/catch basin number where the video segment begins and the manhole/catch basin number where the video segment ends.

.3B Footages along the storm sewer line must be shown on the video report and zeroed out at the beginning of each segment starting from the center of the manhole/catch basin.

.3C The video camera shall be guided forward at a moderate to slow pace along the bottom of the pipe.

.3D The camera shall stop at any unusual instances that are viewed while in progress and provide a more detailed and longer view of the specific instance (i.e. – bad joint, dirt in lines, settlement in line, etc.).

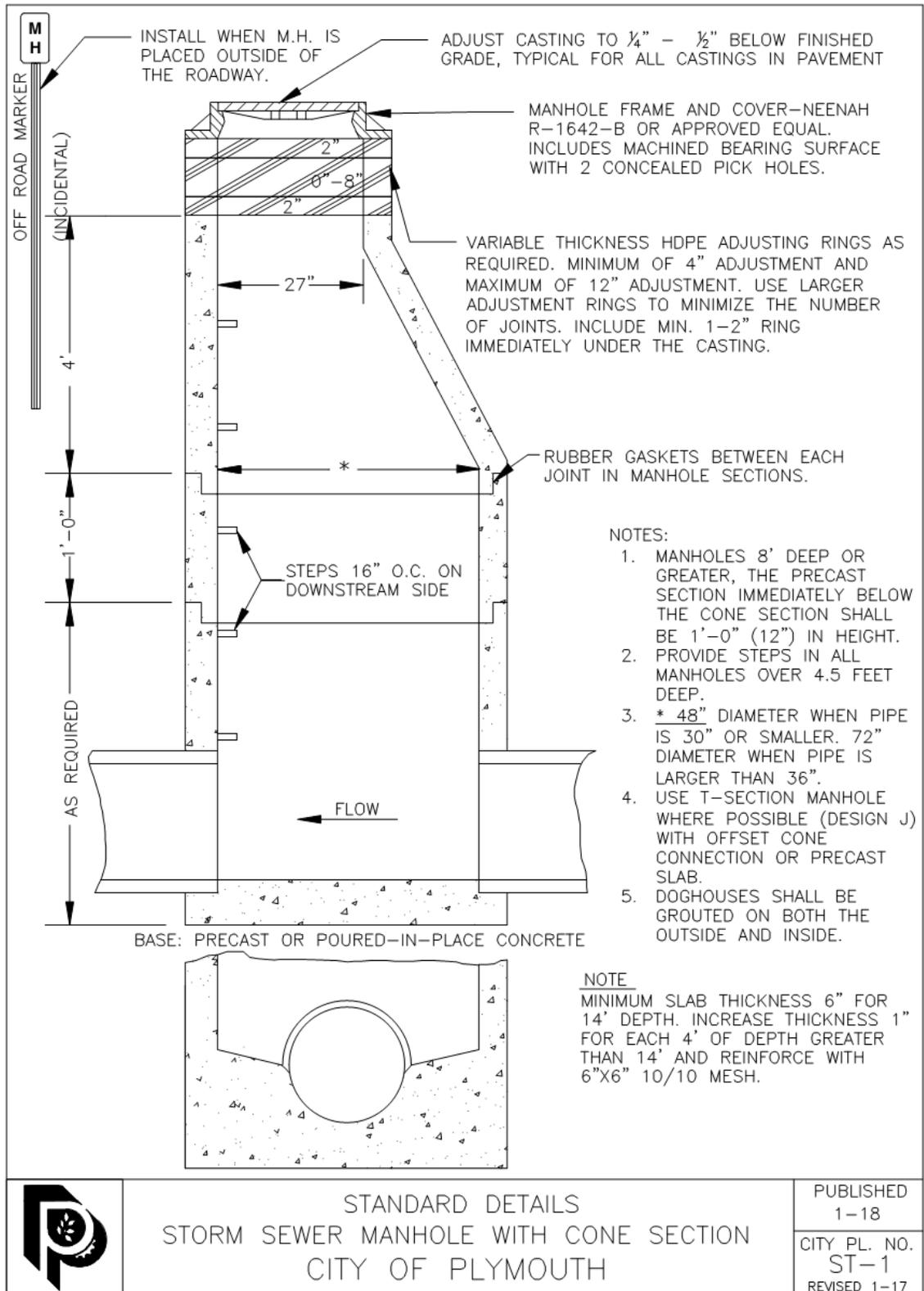
02306 MEASUREMENT AND PAYMENT

All items will be measured separately according to design designation as indicated in the Pay Item name and as may be detailed and defined in the Plans, Specifications, or Special Provisions. Pipe will generally be designated by size (inside diameter or span), strength class, kind or type, and laying condition.

Complete-in-place items shall include all component parts thereof as described or required to complete the unit, but excluding any excesses covered by separate Pay Items. Linear measurement of piping will include the running length of any special fittings (tees, wyes, elbows, gates, etc.) installed within the line of measure between specified terminal points.

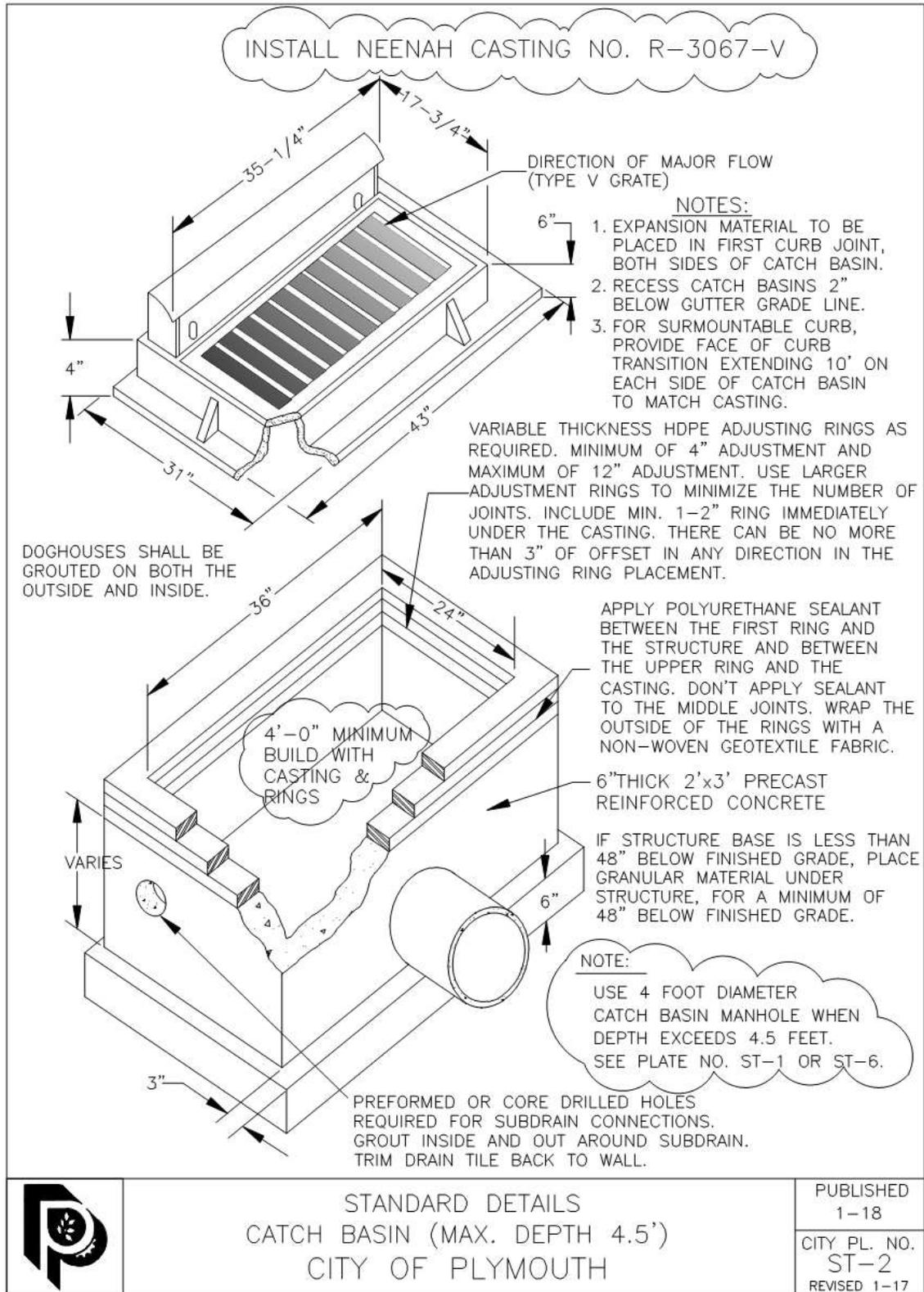
02307 STORM SEWER DETAIL PLATES

ST-1 through ST-22



STANDARD DETAILS
STORM SEWER MANHOLE WITH CONE SECTION
CITY OF PLYMOUTH

PUBLISHED
1-18
CITY PL. NO.
ST-1
REVISED 1-17



STANDARD DETAILS
CATCH BASIN (MAX. DEPTH 4.5')
CITY OF PLYMOUTH

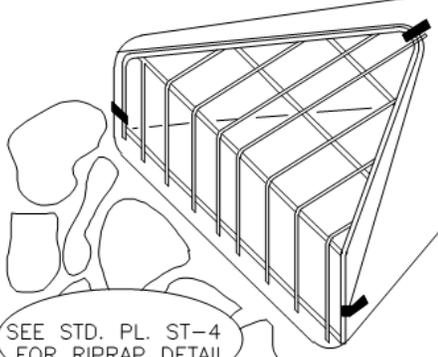
PUBLISHED
1-18

CITY PL. NO.
ST-2
REVISED 1-17

RIP-RAP REQUIRED FOR ALL APRONS: SEE STD. PLATE ST-4

PLACE GRANITE RIP-RAP AROUND SIDES AND OVER THE TOP OF THE F.E.S.

DON'T PLACE RIP-RAP HIGHER THAN THE INVERT OF THE F.E.S.

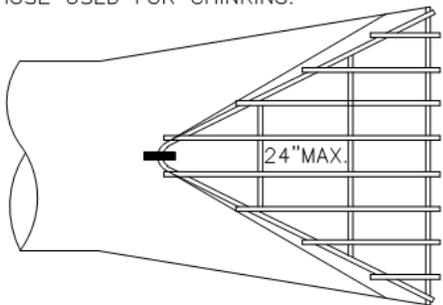


SEE STD. PL. ST-4 FOR RIPRAP DETAIL

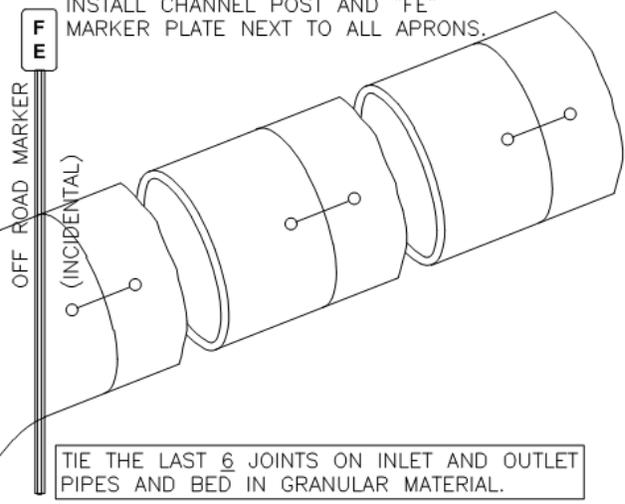
PLACE NONWOVEN GEOTEXTILE FABRIC UNDER RIP-RAP AND EXTENDING 1' UNDER FES

HAND PLACED GRANITE RIPRAP

INDIVIDUAL STONES SHALL NOT WEIGH LESS THAN 50 POUNDS EACH EXCEPT THOSE USED FOR CHINKING.



INSTALL CHANNEL POST AND "FE" MARKER PLATE NEXT TO ALL APRONS.



TIE THE LAST 6 JOINTS ON INLET AND OUTLET PIPES AND BED IN GRANULAR MATERIAL.

USE 2 TIE BOLT FASTENERS PER JOINT INSTALLED AT 60 DEG FROM TOP OR BOTTOM OF PIPE.

USE 5/8" TIE FOR PIPE SIZES 12" TO 27".

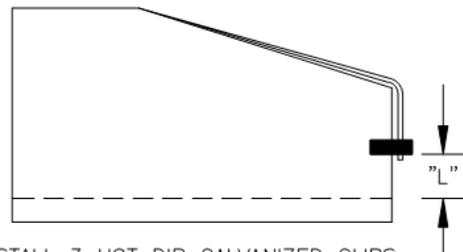
USE 3/4" TIE FOR PIPE SIZES 30" TO 66".

USE 1" TIE FOR PIPE SIZES OVER 72".

NUTS AND WASHERS ARE NOT REQUIRED ON PIPE SIZE LESS THAN 24".

TRASH GUARDS WILL BE REQUIRED ON ALL 24" OR LARGER APRONS UNLESS APPROVED BY THE CITY ENGINEER.

SIZE OF PIPE	BARS	BOLTS	MIN. "L"
21" TO 42"	1"	3/4"	6"
48" TO 72"	1-1/4"	1"	12"



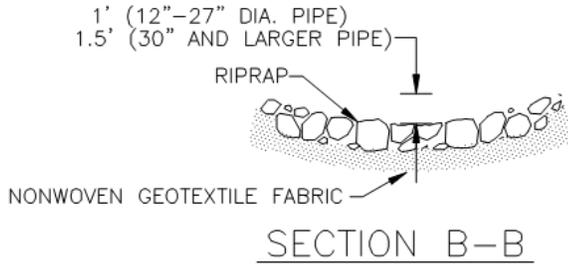
INSTALL 3 HOT DIP GALVANIZED CLIPS TO FASTEN TRASH GUARD TO F.E.S.



STANDARD DETAILS
INLET & OUTLET F.E.S. WITH TRASH GUARD
CITY OF PLYMOUTH

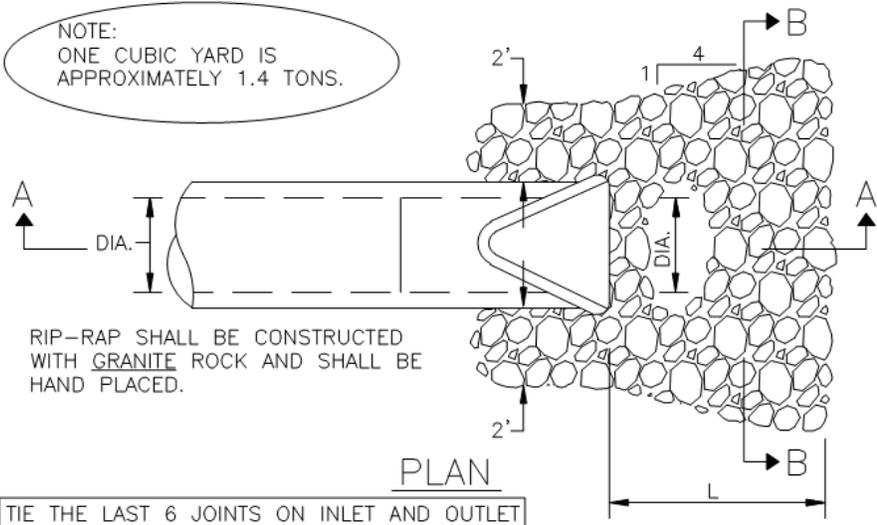
PUBLISHED
1-18

CITY PL. NO.
ST-3
REVISED 1-17



MINIMUM RIPRAP REQUIRED			
DIA. OF PIPE (IN.)	L (FT.)	QUANTITY (C.Y.)	CLASS
12	8	5	III
15	8	5	III
18	10	6	III
24	12	8	III
30	14	12	III
36	16	14	III
42	18	22	IV
48	20	26	IV
>48	22-28	30-40	IV

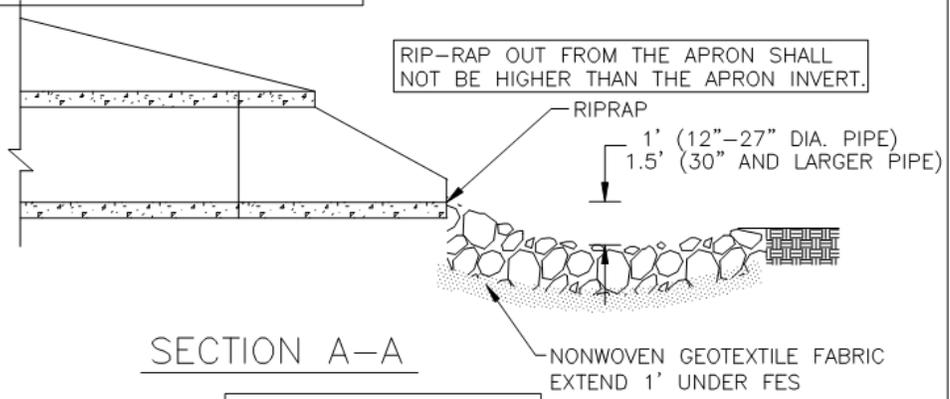
NOTE:
ONE CUBIC YARD IS
APPROXIMATELY 1.4 TONS.



RIP-RAP SHALL BE CONSTRUCTED WITH GRANITE ROCK AND SHALL BE HAND PLACED.

TIE THE LAST 6 JOINTS ON INLET AND OUTLET PIPES AND BED IN GRANULAR MATERIAL.

RIP-RAP OUT FROM THE APRON SHALL NOT BE HIGHER THAN THE APRON INVERT.

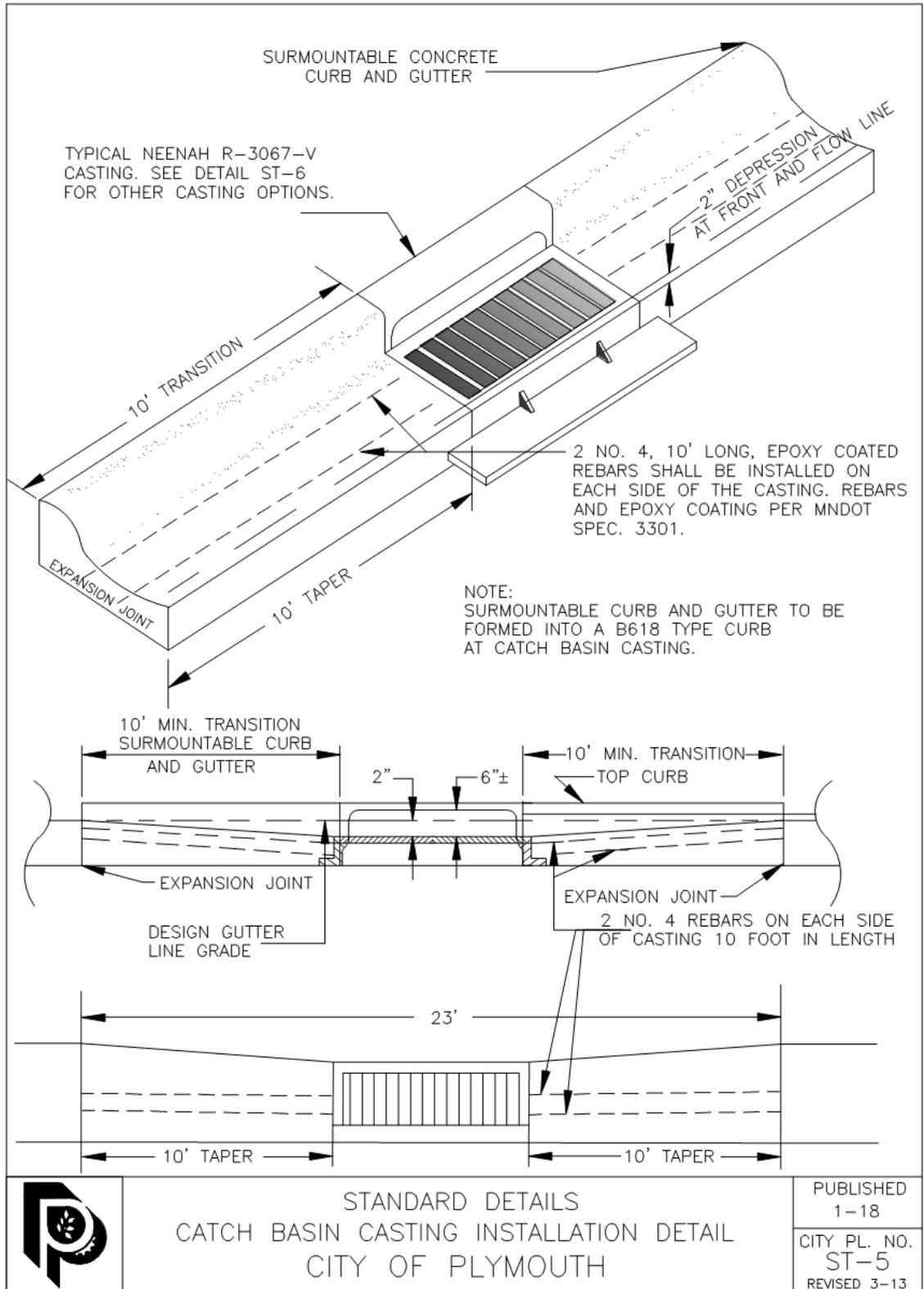


RIP-RAP REQUIRED AT ALL APRONS



STANDARD DETAILS
RIPRAP DETAIL FOR FLARED END SECTIONS
CITY OF PLYMOUTH

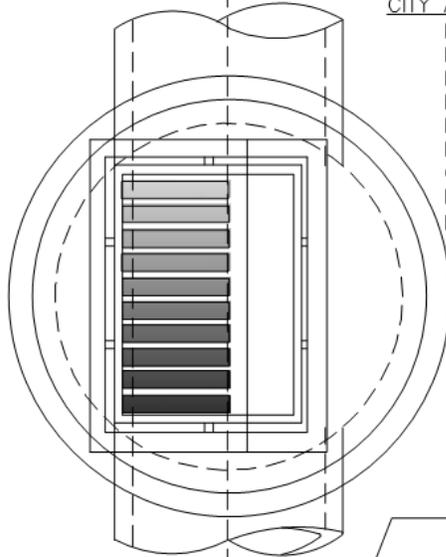
PUBLISHED
1-18
CITY PL. NO.
ST-4
REVISED 1-17



NOTE: 24"X36" SLAB OPENING FOR NEENAH R-3067-V CASTING AND TYPE GRATE.

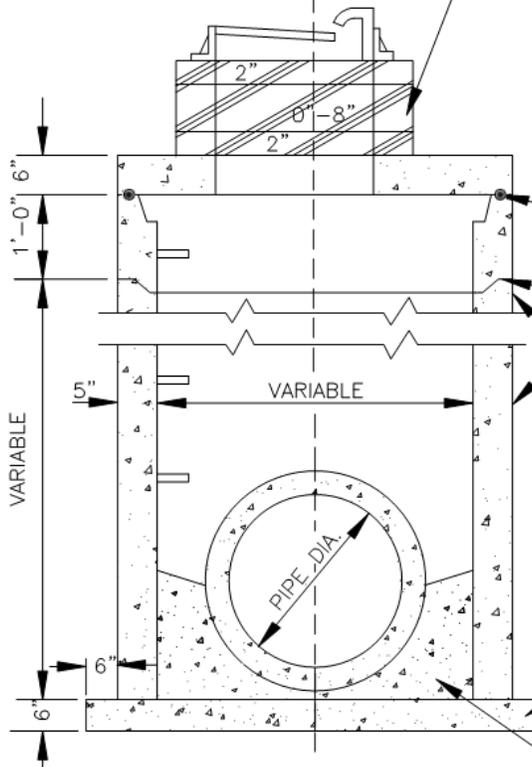
OTHER POTENTIALLY ACCEPTABLE CATCH BASIN CASTINGS DEPENDING UPON CIRCUMSTANCES AND SUBJECT TO CITY APPROVAL:

- NEENAH R-2561-A BEEHIVE GRATE & CASTING
- NEENAH R-2573 CONCAVE GRATE & CASTING
- NEENAH R-2577 CONVEX GRATE & CASTING
- NEENAH R-3250-1 GRATE & CASTING
- NEENAH R-3290-A FOR CROSS GUTTERS
- NEENAH R-3501-TR & TL FOR SURMOUNTABLE CURB
- NEENAH R-4342 WITH CONCRETE MNDOT FRAME PLATE #4143E



DIMENSION FROM BACK OF CURB TO CENTER OF PIPE.
 4' DIA. M.H.-9" IN FROM BACK OF CURB
 6' DIA. M.H.-3" BEHIND BACK OF CURB
 8' DIA. M.H.-15" BEHIND BACK OF CURB

VARIABLE THICKNESS HDPE ADJUSTING RINGS AS REQUIRED. MINIMUM OF 4" ADJUSTMENT AND MAXIMUM OF 12" ADJUSTMENT. USE LARGER ADJUSTMENT RINGS TO MINIMIZE THE NUMBER OF JOINTS. INCLUDE MIN. 1-2" RING IMMEDIATELY UNDER THE CASTING. THERE CAN BE NO MORE THAN 3" OF OFFSET IN ANY DIRECTION IN THE ADJUSTING RING PLACEMENT. USE TAPERED RINGS TO MATCH CASTING TO STREET GRADE. APPLY BUTYL SEALANT BETWEEN THE FIRST RING AND THE STRUCTURE AND BETWEEN THE UPPER RING AND THE CASTING. DON'T APPLY SEALANT TO THE MIDDLE JOINTS. WRAP THE OUTSIDE OF THE RINGS WITH A NON-WOVEN GEOTEXTILE FABRIC.



- RAMNEK OR SIMILAR GASKET TYPE MATERIAL TO BE PLACED BETWEEN SLAB AND TOP OF MANHOLE SECTION.
- ALL MANHOLE JOINTS TO HAVE RUBBER GASKETS
- PRECAST CONCRETE MANHOLE SECTION.
- MANHOLE STEPS NEENAH R1981J PLASTIC COATED OR APPROVED EQUAL, 16" O.C. USE PRECAST SECTIONS WHENEVER POSSIBLE.
- USE MIN. 4' DIAMETER MANHOLE SECTIONS FOR PIPE SIZES UP TO 36" DIAMETER.
- DOGHOUSES SHALL BE GROUTED ON BOTH THE OUTSIDE AND INSIDE.
- BOTH BASE SLAB AND TOP SLAB VARIES IN THICKNESS, (6" MINIMUM-12" MAXIMUM) DEPENDING UPON STRUCTURE DIAMETER AND DEPTH. FOLLOW MANUFACTURERS SPECIFICATIONS.
- GROUT INVERT BOTTOM TO 1/2 DIA. OF PIPE.



STANDARD DETAILS
 PRECAST STORM SEWER CATCH BASIN MANHOLE
 WITH REINFORCED CONCRETE TOP SLAB
 CITY OF PLYMOUTH

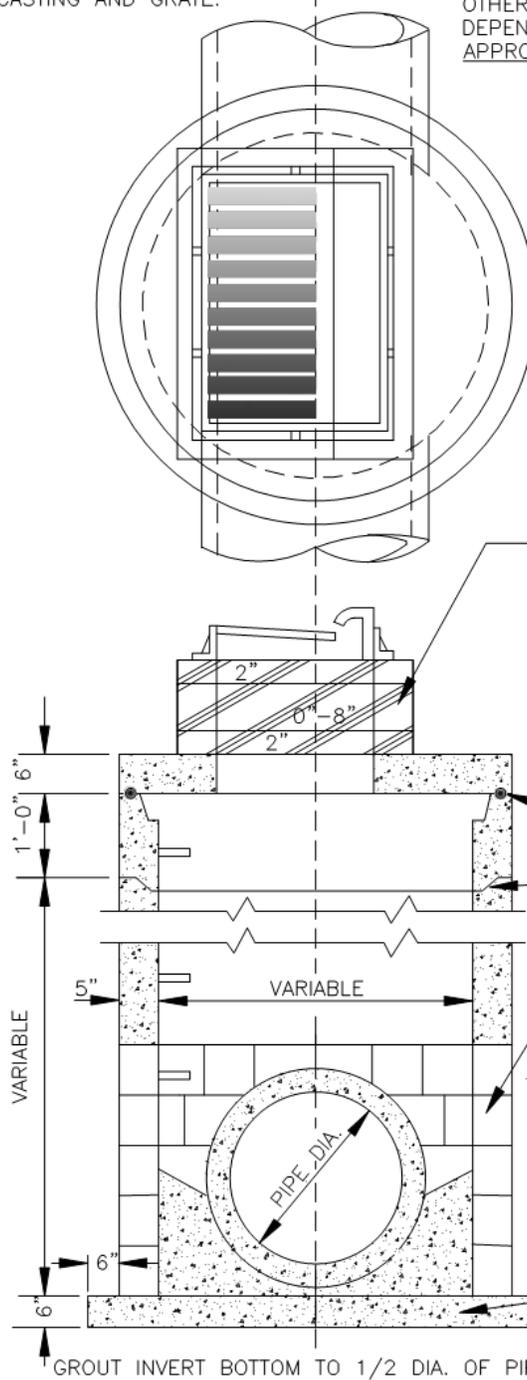
PUBLISHED
 1-18
 CITY PL. NO.
 ST-6
 REVISED 1-18

NOTE: 24"X36" SLAB OPENING FOR NEENAH R-3067-V CASTING AND GRATE.

OTHER POTENTIALLY ACCEPTABLE CATCH BASIN CASTINGS DEPENDING UPON CIRCUMSTANCES AND SUBJECT TO CITY APPROVAL:

- NEENAH R-2561-A BEEHIVE GRATE & CASTING
- NEENAH R-2573 CONCAVE GRATE & CASTING
- NEENAH R-2577 CONVEX GRATE & CASTING
- NEENAH R-3250-1 GRATE & CASTING
- NEENAH R-3290-A FOR CROSS GUTTERS
- NEENAH R-3501-TR & TL FOR SURMOUNTABLE CURB
- NEENAH R-4342 WITH CONCRETE MNDOT FRAME PLATE #4143E

DIMENSION FROM BACK OF CURB TO CENTER OF PIPE.
 4' DIA. M.H.-9" IN FROM BACK OF CURB
 6' DIA. M.H.-3" BEHIND BACK OF CURB
 8' DIA. M.H.-15 BEHIND BACK OF CURB



VARIABLE THICKNESS HDPE ADJUSTING RINGS AS REQUIRED. MINIMUM OF 4" ADJUSTMENT AND MAXIMUM OF 12" ADJUSTMENT. USE LARGER ADJUSTMENT RINGS TO MINIMIZE THE NUMBER OF JOINTS. INCLUDE MIN. 1-2" RING IMMEDIATELY UNDER THE CASTING. THERE CAN BE NO MORE THAN 3" OF OFFSET IN ANY DIRECTION IN THE ADJUSTING RING PLACEMENT. USE TAPERED RINGS TO MATCH CASTING TO STREET GRADE. APPLY BUTYL SEALANT BETWEEN THE FIRST RING AND THE STRUCTURE AND BETWEEN THE UPPER RING AND THE CASTING. DON'T APPLY SEALANT TO THE MIDDLE JOINTS. WRAP THE OUTSIDE OF THE RINGS WITH A NON-WOVEN GEOTEXTILE FABRIC.

RAMNEK OR SIMILAR GASKET TYPE MATERIAL TO BE PLACED BETWEEN SLAB AND TOP OF MANHOLE SECTION.
 ALL MANHOLE JOINTS TO HAVE RUBBER GASKETS.
 MANHOLE STEPS NEENAH R1981J PLASTIC COATED OR APPROVED EQUAL, 16" O.C.

USE PRECAST SECTIONS WHENEVER POSSIBLE WITH APPROVAL: 8" PRECAST CONCRETE BLOCK TO TOP OF THE PIPE, WITH PRECAST MANHOLE SECTION ABOVE TOP OF PIPE, PLASTER INTERIOR, EXTERIOR AND ALL GAPS IN CONCRETE BLOCK WITH FLEX SEAL OR APPROVED EQUAL.

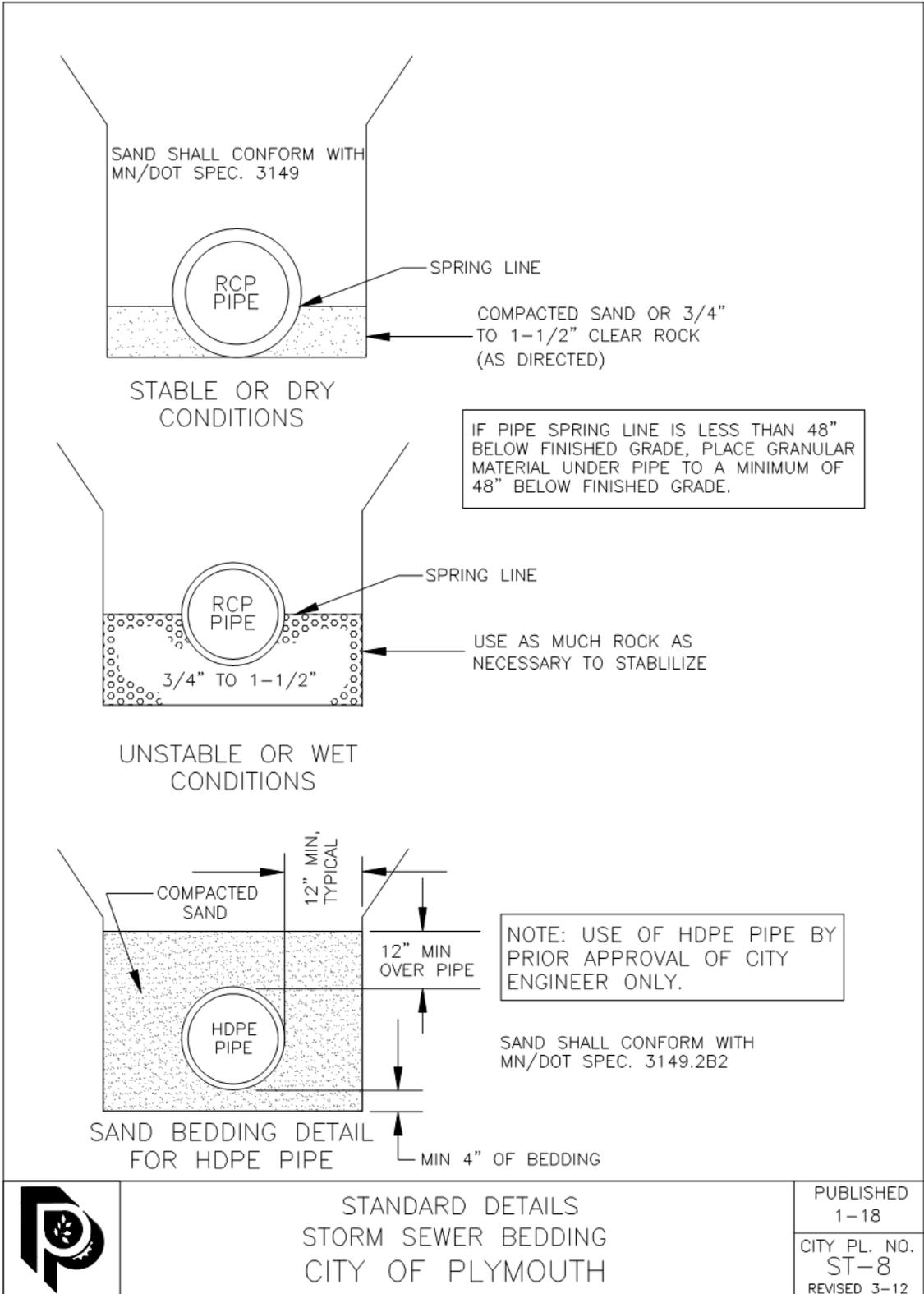
USE MIN. 4' DIAMETER MANHOLE SECTIONS FOR PIPE SIZES UP TO 36" DIAMETER.
 DOGHOUSES SHALL BE GROUTED ON BOTH THE OUTSIDE AND INSIDE.

BOTH BASE SLAB AND TOP SLAB VARIES IN THICKNESS, (6" MINIMUM-12" MAXIMUM) DEPENDING UPON STRUCTURE DIAMETER AND DEPTH. FOLLOW MANUFACTURES SPECIFICATIONS.

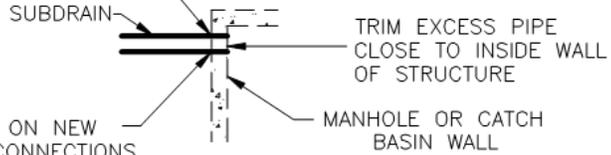


STANDARD DETAILS
 BLOCK STORM SEWER CATCH BASIN MANHOLE
 WITH REINFORCED CONCRETE TOP SLAB
 CITY OF PLYMOUTH

PUBLISHED
 1-18
 CITY PL. NO.
 ST-7
 REVISED 3-11

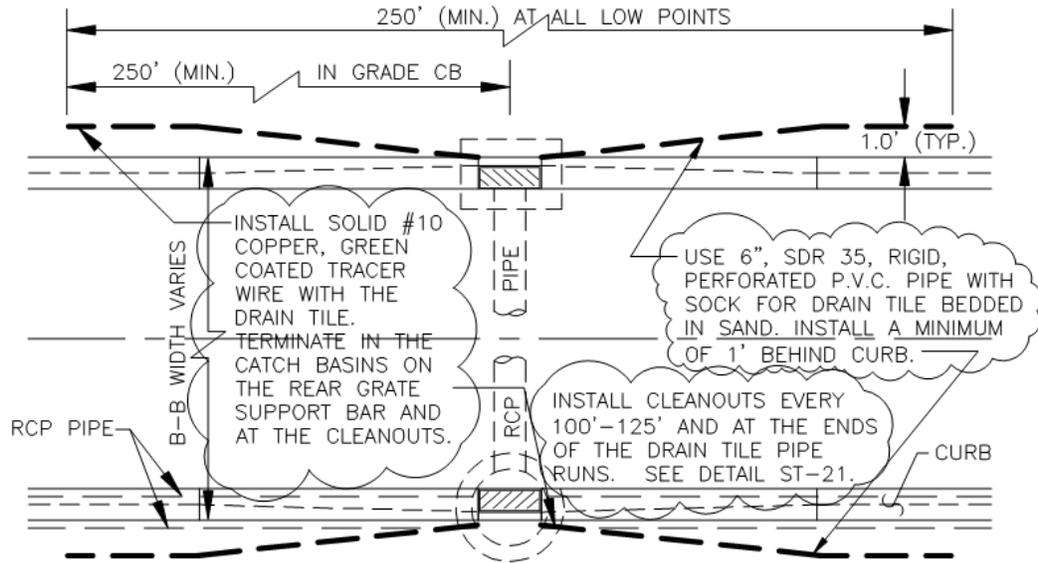


MORTAR JOINT INSIDE AND OUTSIDE STRUCTURE,
WHERE DRAIN PIPE COMES INTO MANHOLE
OR CATCH BASIN.

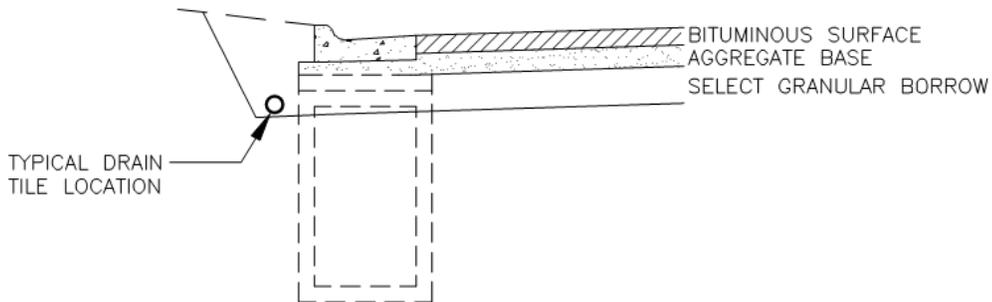


PREFORMED HOLES REQUIRED ON NEW
STRUCTURES FOR SUBDRAIN CONNECTIONS.
CORE DRILL SUBDRAIN HOLES FOR ANY
ADDITIONAL CONNECTIONS TO NEW OR
EXISTING STRUCTURES.

CONNECTION



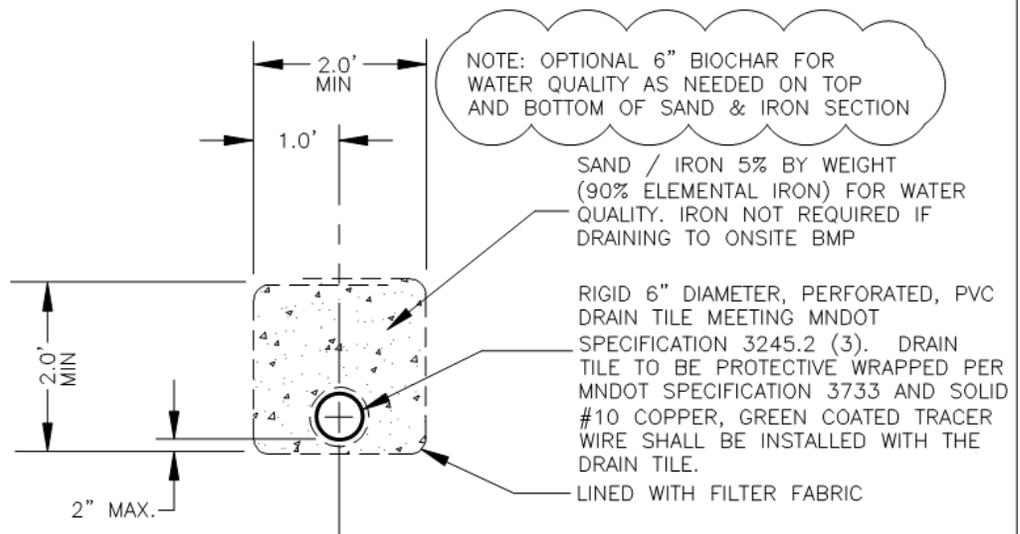
6" RIGID PERFORATED DRAINTILE IS REQUIRED AT ALL LOW POINT CATCH BASINS AND ON THE UPHILL SIDE OF ALL IN-GRADE CATCH BASINS. BENDS MAYBE USED UP TO 22 1/2 DEGREES WITH THE RIDGE DRAIN TILE. FLEXIBLE 6" DRAIN TILE CAN BE USED IN CUL-DE-SACS.



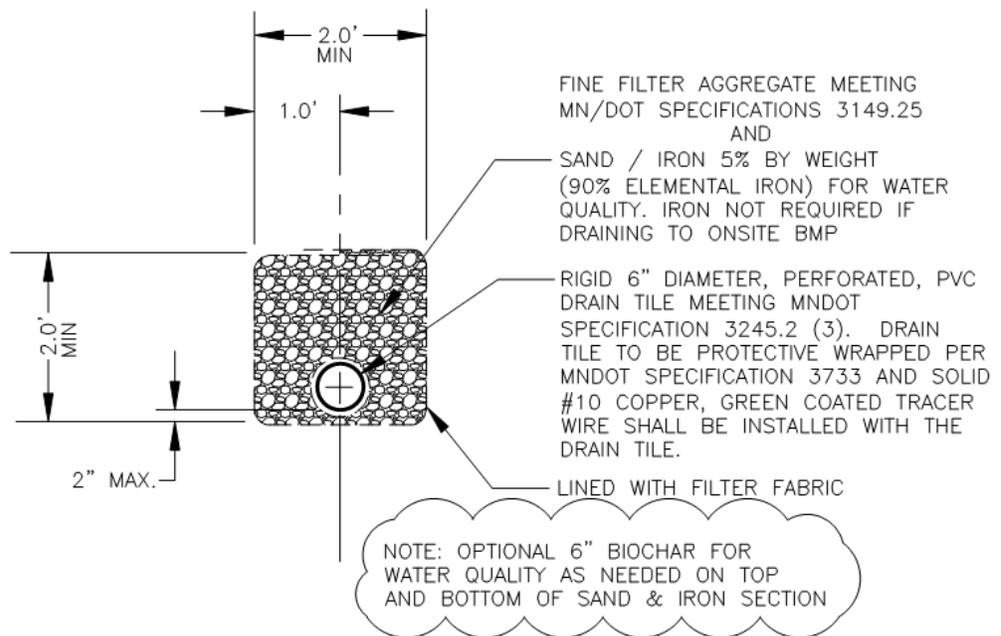
STANDARD DETAILS
SUBDRAIN DETAILS
CITY OF PLYMOUTH

PUBLISHED
1-18

CITY PL. NO.
ST-9
REVISED 1-17



ALTERNATIVE SUBDRAIN INSTALLATIONS
FOR USE IN GREEN AREAS
IF APPROVED BY THE CITY ENGINEER

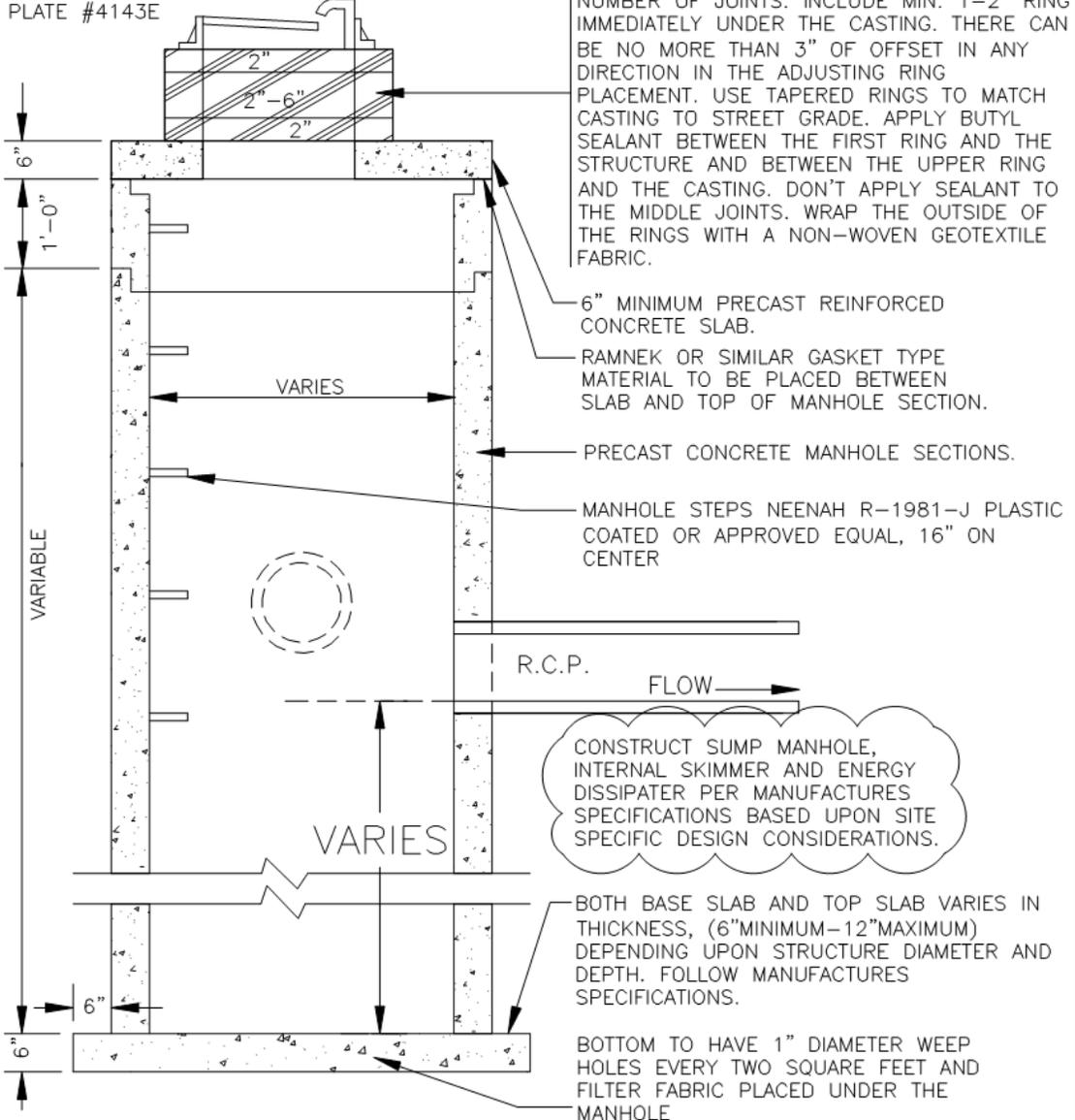


	STANDARD DETAILS PERFORATED DRAIN TILE PIPE CITY OF PLYMOUTH	PUBLISHED 1-18
		CITY PL. NO. ST-10
		REVISED 1-18

NOTE: 24"x36" SLAB OPENING FOR NEENAH R-3067-V CASTING AND GRATE. OTHER POTENTIALLY ACCEPTABLE CATCH BASIN CASTINGS DEPENDING UPON THE CIRCUMSTANCES AND SUBJECT TO CITY APPROVAL ARE:

NEENAH R-2561-A BEEHIVE GRATE & CASTING
 NEENAH R-2573 CONCAVE GRATE & CASTING
 NEENAH R-2577 CONVEX GRATE & CASTING
 NEENAH R-3250-1 GRATE & CASTING
 NEENAH R-3290-A FOR CROSS GUTTERS
 NEENAH R-3501-TR & TL FOR SURMOUNTABLE CURB
 NEENAH R-4342 WITH CONCRETE MNDOT FRAME PLATE #4143E

VARIABLE THICKNESS HDPE ADJUSTING RINGS AS REQUIRED. MINIMUM OF 4" ADJUSTMENT AND MAXIMUM OF 12" ADJUSTMENT. USE LARGER ADJUSTMENT RINGS TO MINIMIZE THE NUMBER OF JOINTS. INCLUDE MIN. 1-2" RING IMMEDIATELY UNDER THE CASTING. THERE CAN BE NO MORE THAN 3" OF OFFSET IN ANY DIRECTION IN THE ADJUSTING RING PLACEMENT. USE TAPERED RINGS TO MATCH CASTING TO STREET GRADE. APPLY BUTYL SEALANT BETWEEN THE FIRST RING AND THE STRUCTURE AND BETWEEN THE UPPER RING AND THE CASTING. DON'T APPLY SEALANT TO THE MIDDLE JOINTS. WRAP THE OUTSIDE OF THE RINGS WITH A NON-WOVEN GEOTEXTILE FABRIC.



STANDARD DETAILS
 SUMP CATCH BASIN MANHOLE
 CITY OF PLYMOUTH

PUBLISHED
 1-18
 CITY PL. NO.
 ST-11
 REVISED 3-16

CONSTRUCTION STANDARDS AND SPECIFICATIONS (ADAPTED FROM STORMWATER MANAGER'S RESOURCE CENTER, WWW.STORMWATERCENTER.ORG/NET/FILES/STORMWATERCONSTRUCTIONGUIDE... WITH SOME ADJUSTIONS)

1. TEMPORARY EROSION CONTROL MEASURES IN ACCORDANCE WITH MNDOT GENERAL ORDINANCE 2573 SHALL BE INSTALLED PRIOR TO THE START OF ANY CONSTRUCTION OPERATION THAT MAY CAUSE ANY SEDIMENTATION OR SILTATION AT THE SITE. AREAS DESIGNATED FOR BORROW PILES, EMBANKMENT, SPOIL PILES, AND OTHER MATERIALS SHALL BE CLEARED FROM POND VEGETATION AND OTHER MATERIAL SHALL BE CLEARED FROM POND AREA.
2. TOPSOIL SHALL BE STOCKPILED FOR FUTURE USE AS SPECIFIED.
3. BARRELS SHALL BE TAKEN FROM APPROVED BORROW AREAS AND SHALL BE FREE OF ROOTS, STUMPS, WOOD, RUBBISH, STONES GREATER THAN 6", FROZEN MATERIAL, AND OTHER OBJECTIONABLE MATERIALS.
4. FILL MATERIAL FOR CENTER OF EMBANKMENT SHALL CONFORM TO UNITED SOIL CLASSIFICATION GC, SC, CH, OR CL AND MUST HAVE AT LEAST 20% PASSING THE #200 SIEVE. CONSIDERATION MAY BE GIVEN TO THE USE OF OTHER MATERIALS IN THE OUTER PORTIONS OF THE EMBANKMENT MUST HAVE THE CAPABILITY TO SUPPORT VEGETATION OF THE QUALITY REQUIRED TO PREVENT EROSION OF THE EMBANKMENT.
5. AREAS ON WHICH FILL IS TO BE PLACED SHALL BE SCARIFIED PRIOR TO PLACEMENT OF FILL. MATERIALS SHALL BE PLACED IN MAXIMUM 8" HIGH THICK (BEFORE COMPACTION) LAYERS WHICH ARE TO BE CONTIGUOUS OVER THE ENTIRE EMBANKMENT. THE TOP SURFACE OF THE EMBANKMENT SHALL BE FINISHED TO THE DOWNSTREAM PORTIONS OF THE EMBANKMENT. THE PRINCIPAL SPILLWAY MUST BE INSTALLED CONCURRENTLY WITH FILL PLACEMENT AND NOT EXCAVATED INTO THE EMBANKMENT.
6. WHEN REQUIRED BY THE REVIEWING AGENCY THE MINIMUM REQUIRED DENSITY SHALL NOT BE LESS THAN 95% MAXIMUM DRY DENSITY WITH A MOISTURE CONTENT OF 2% ABOVE OR BELOW THE OPTIMUM MOISTURE CONTENT. METHODS NECESSARY TO OBTAIN THAT DENSITY, AND IS TO BE CERTIFIED BY THE ENGINEER AT THE TIME OF CONSTRUCTION. ALL COMPACTION IS TO BE DETERMINED BY AASHTO METHOD T-99 (STANDARD PROCTOR).
7. THE CORE OF THE EMBANKMENT SHALL BE PARALLEL TO THE CENTERLINE OF THE EMBANKMENT. THE TOP WIDTH OF THE CORE SHALL BE A MINIMUM OF 12" AND SHALL BE FINISHED TO THE PROPER GRADE. THE TOP OF THE WATER ELEVATION UP AS SHOWN ON THE PLANS. THE SIDE SLOPES SHALL BE 1 TO 1 OR FLATTER. THE CORE SHALL BE COMPACTED WITH CONSTRUCTION EQUIPMENT, ROLLERS, OR HAND TAMPERS TO ASSURE MAXIMUM DENSITY AND MINIMUM PERMEABILITY. IN ADDITION, THE CORE SHALL BE PLACED CONCURRENTLY WITH THE OUTER SHELL OF THE EMBANKMENT.

STRUCTURE BACKFILL

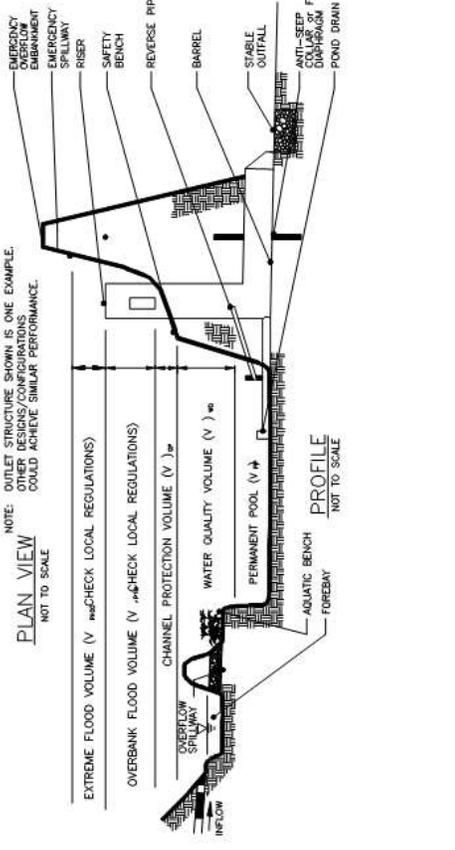
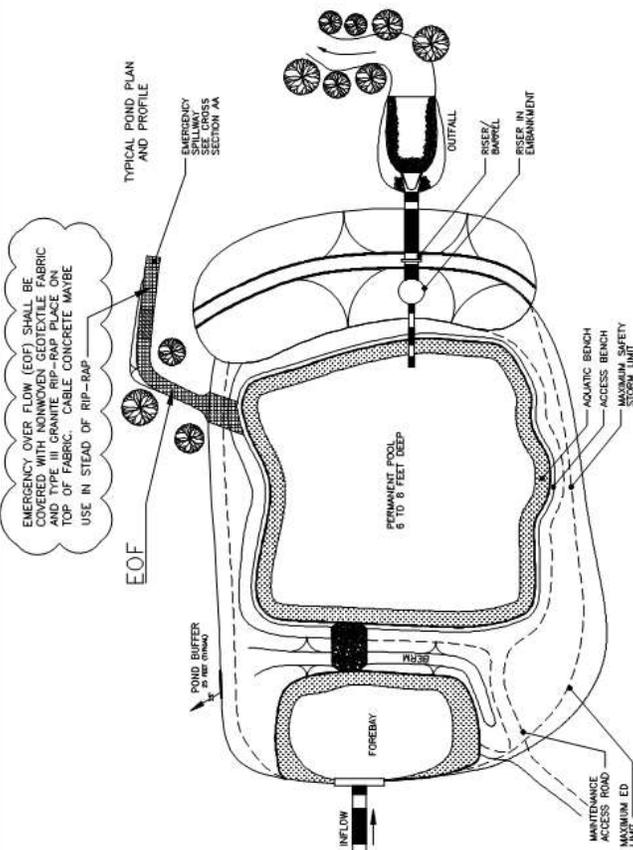
1. BACKFILL ADJACENT TO PILES OR STRUCTURES SHALL BE OF THE TYPE AND QUALITY CONFORMING TO THAT SPECIFIED FOR THE ADJOINING FILL MATERIAL. THE FILL SHALL BE PLACED IN HORIZONTAL LAYERS NOT TO EXCEED FOUR INCHES IN THICKNESS AND COMPACTED BY HAND TAMPERS OR OTHER MANUALLY DIRECTED COMPACTION EQUIPMENT. THE FILL SHALL NEED TO FILL COMPLETELY ALL SPACES UNDER AND ADJACENT TO THE PILE.
2. AT NO TIME DURING THE BACKFILLING OPERATION SHALL DRIVEN EQUIPMENT BE ALLOWED TO OPERATE CLOSER THAN FOUR FEET, MEASURED HORIZONTALLY, TO ANY PART OF A STRUCTURE. UNDER NO CIRCUMSTANCES SHALL EQUIPMENT BE DRIVEN OVER ANY PART OF A CONCRETE STRUCTURE OR PIPE UNLESS THERE IS A COMPACTED FILL OF 24" OR GREATER OVER THE STRUCTURE OR PIPE.

CARE OF WATER DURING CONSTRUCTION

1. ALL WORK ON PERMANENT STRUCTURES SHALL BE CARRIED OUT IN AREAS FREE FROM WATER. TEMPORARY DICES, LEVES, COFFERDAMS, DRAINAGE CHANNELS, AND STREAM DIVERSIONS NECESSARY TO PROTECT THE AREAS TO BE OCCUPIED BY THE PERMANENT STRUCTURES SHALL BE INSTALLED AND MAINTAINED THROUGHOUT THE CONSTRUCTION PERIOD FOR REMOVAL OF WATER FROM VARIOUS PARTS OF THE WORK.
2. AFTER HAVING SERVED THEIR PURPOSE, ALL TEMPORARY PROTECTIVE WORKS SHALL BE REMOVED OR LEVELED AND GRADED TO THE EXTENT REQUIRED TO PREVENT OBSTRUCTION OF THE FLOW OF WATER TO THE SPILLWAY OR OUTLET WORKS.
3. STREAM DIVERSIONS SHALL BE MAINTAINED UNTIL THE FULL FLOW CAN BE PASSED THROUGH THE PERMANENT WORKS.

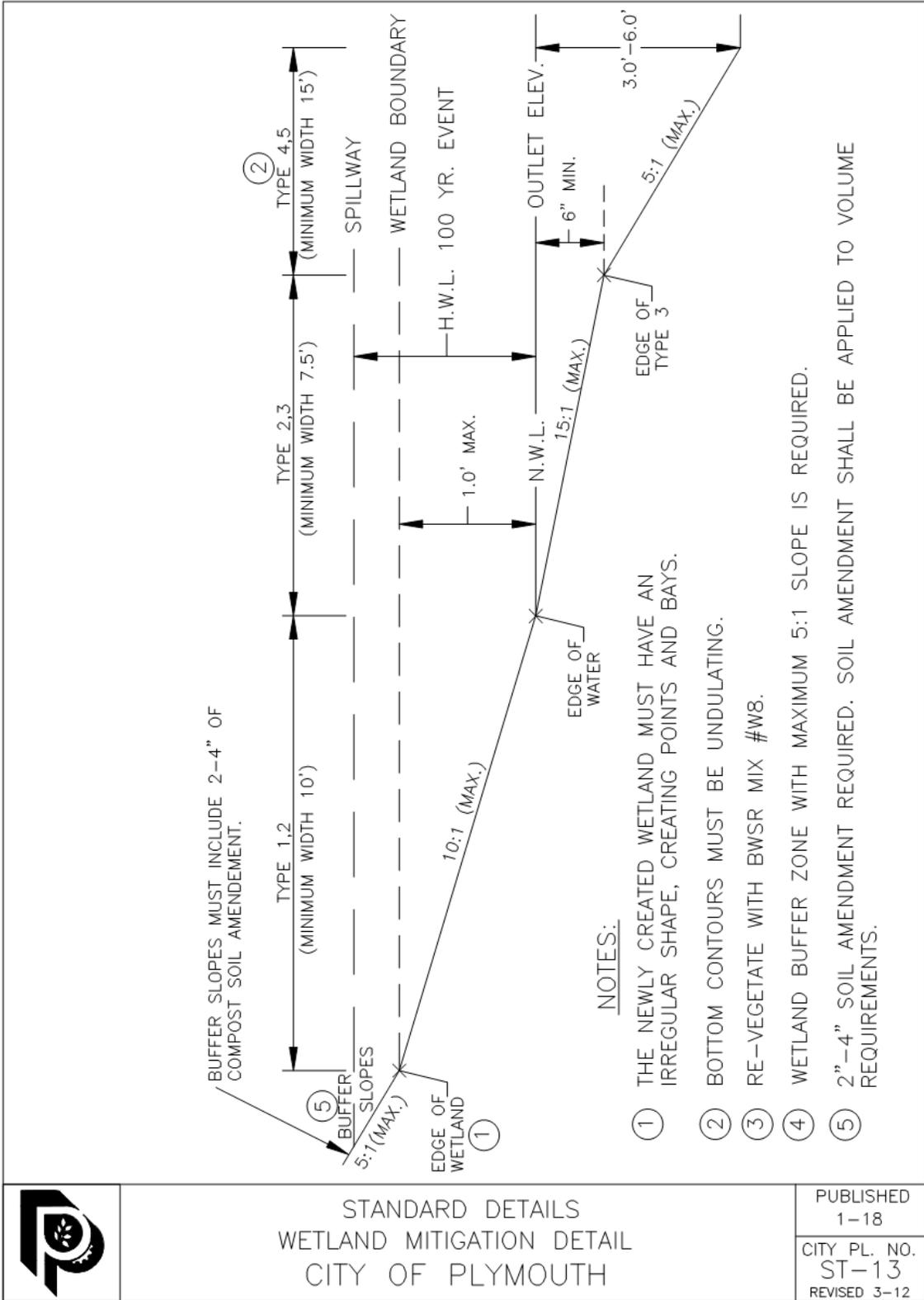
STABILIZATION AND EROSION CONTROL

1. ALL EXPOSED SURFACES OF THE EMBANKMENT, SPILLWAY, SPOIL AND BORROW AREAS, AND BERMS SHALL BE STABILIZED BY SEEDING, LIMING, FERTILIZING AND MULCHING IN ACCORDANCE WITH LOCAL NATURAL RESOURCES CONSERVATION SERVICE STANDARDS FOR EROSION CONTROL. THE TOPSOIL SHALL BE PLACED ON THESE AREAS TO SUPPORT STABILIZING VEGETATION.
2. FILTER FABRIC PLACED BENEATH THE RIP-RAP SHALL MEET STATE OR LOCAL DEPARTMENT OF TRANSPORTATION REQUIREMENTS FOR A CLASS "C" FILTER FABRIC.



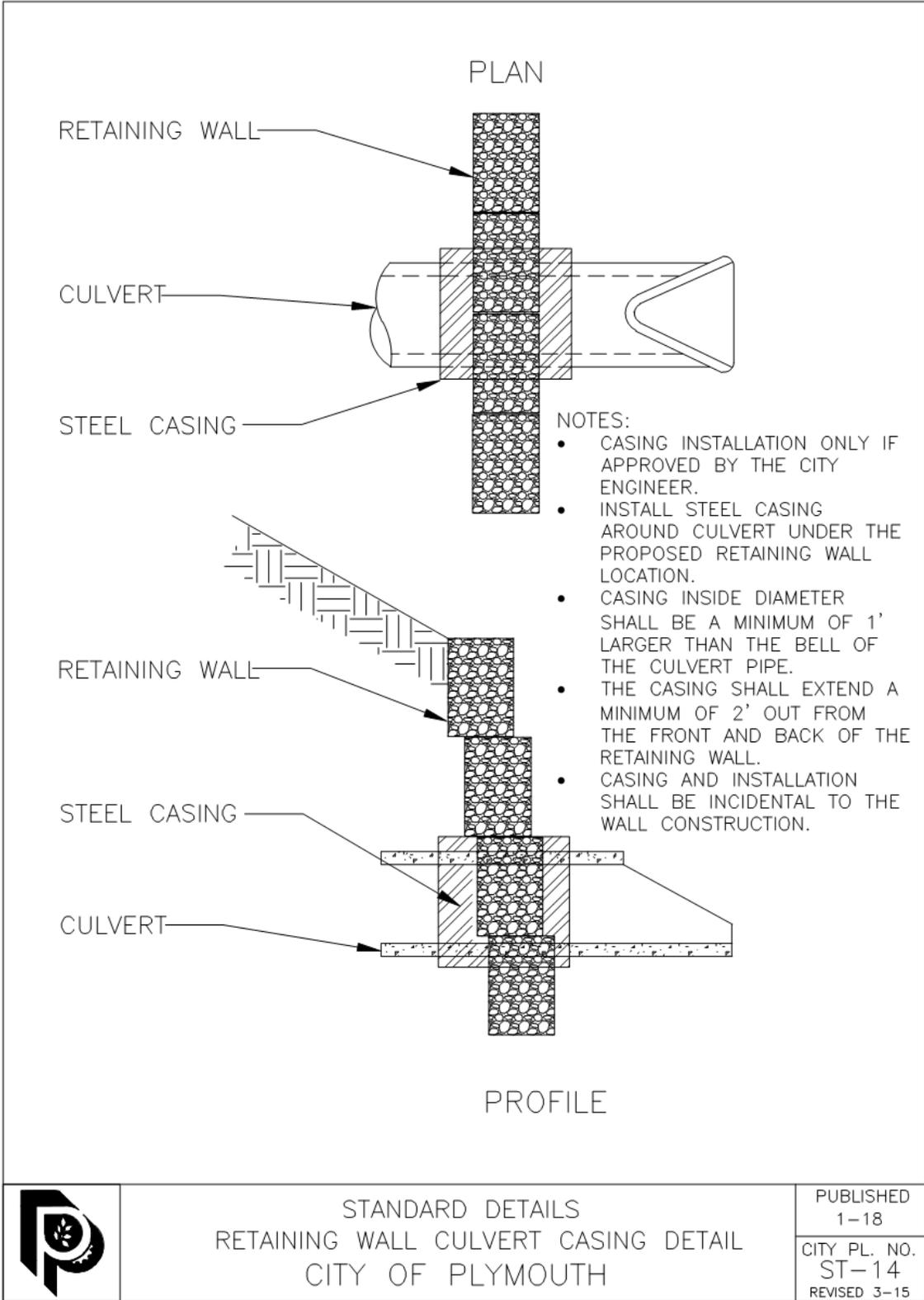
STANDARD DETAILS
TYPICAL TREATMENT POND
CITY OF PLYMOUTH

PUBLISHED
1-18
CITY PL. NO.
ST-12
REVISED 1-18



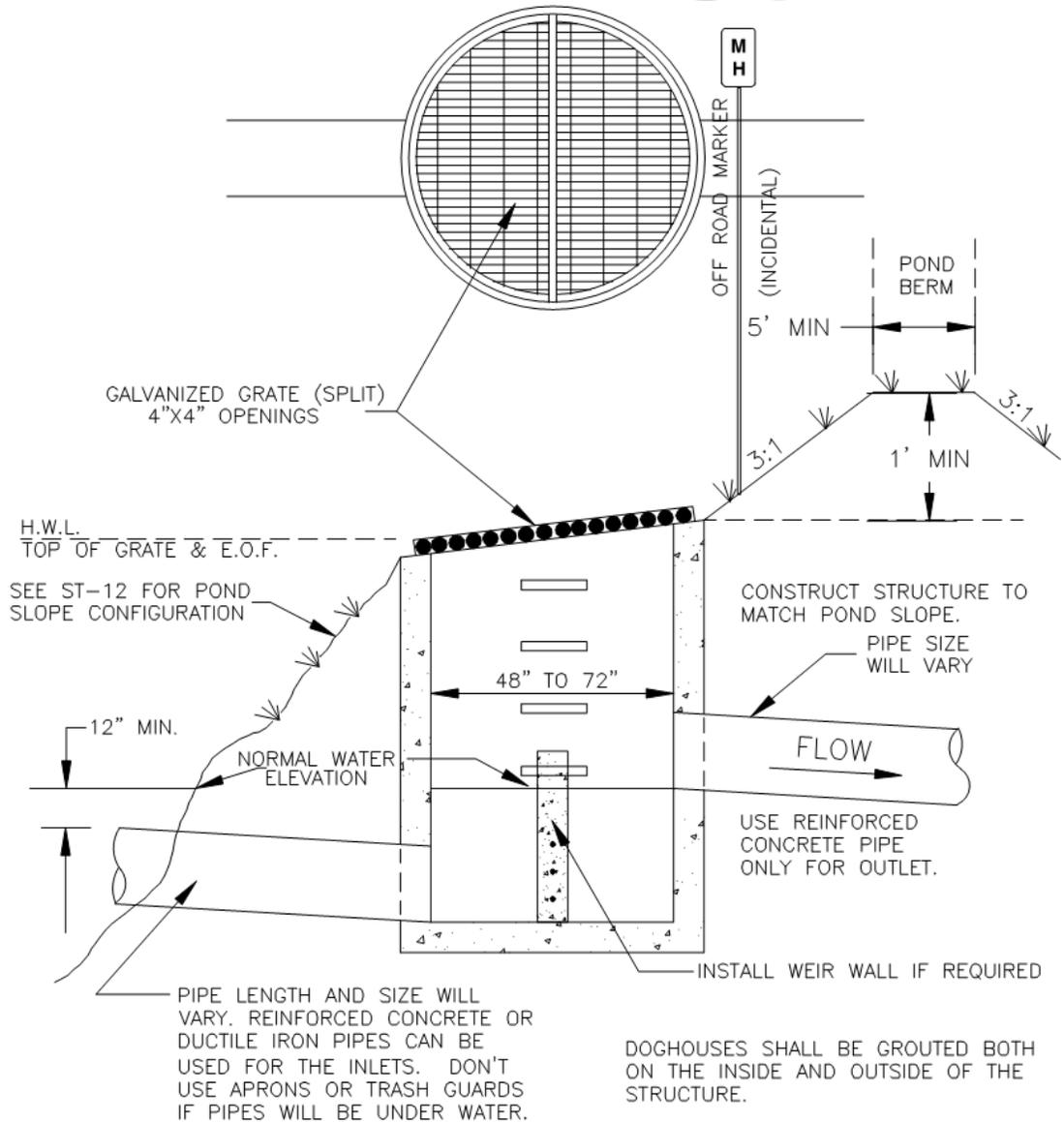
STANDARD DETAILS
WETLAND MITIGATION DETAIL
CITY OF PLYMOUTH

PUBLISHED
1-18
CITY PL. NO.
ST-13
REVISED 3-12



EOF's SHALL BE ARMORED. GRANITE RIP-RAP OR CABLE CONCRETE SHALL BE PLACED ON TOP OF NONWOVEN GEOTEXTILE FABRIC.

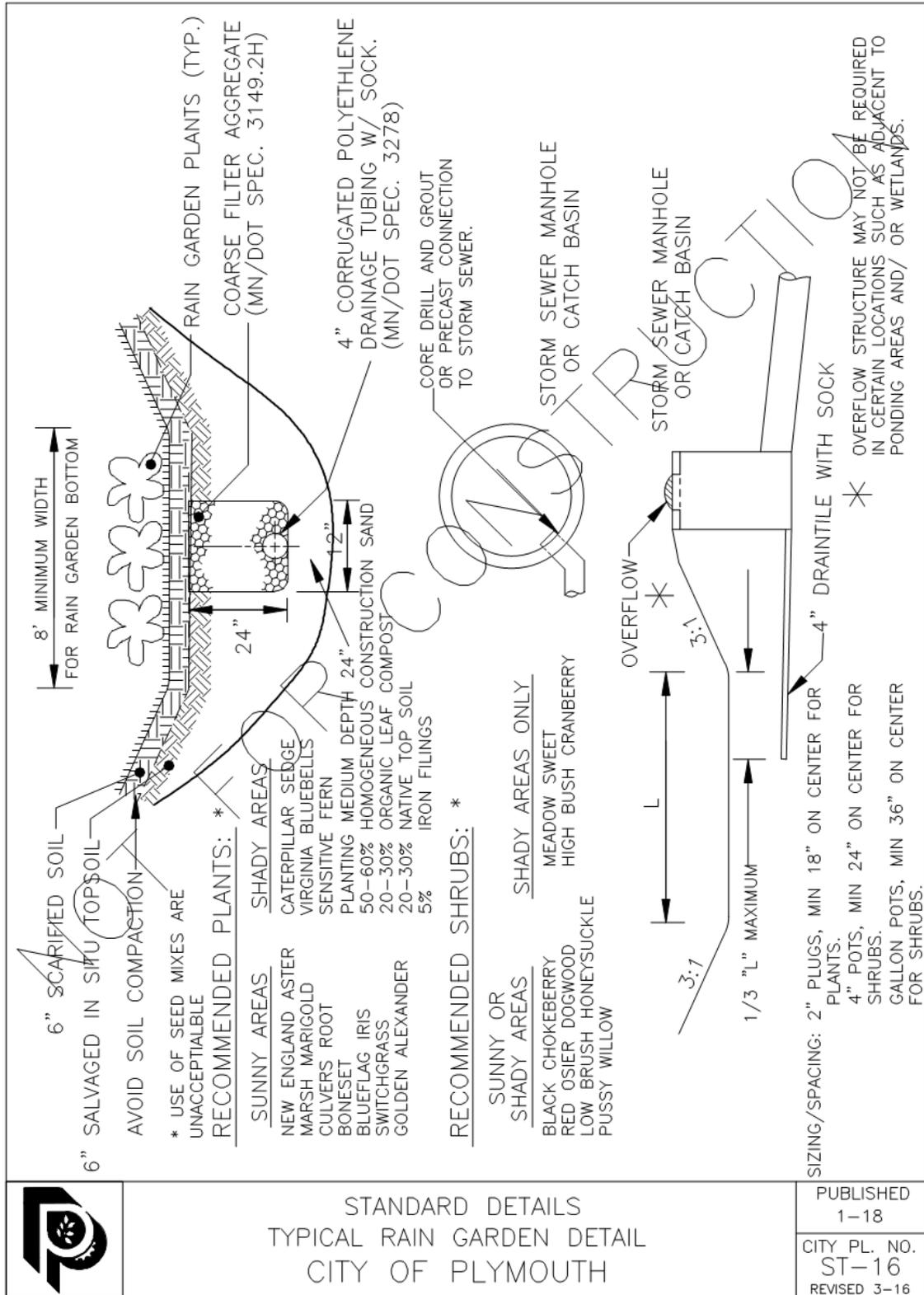
RESTRAIN ALL JOINTS ON THE INLET AND OUTLET PIPES.



STANDARD DETAILS
SKIMMER STRUCTURE
CITY OF PLYMOUTH

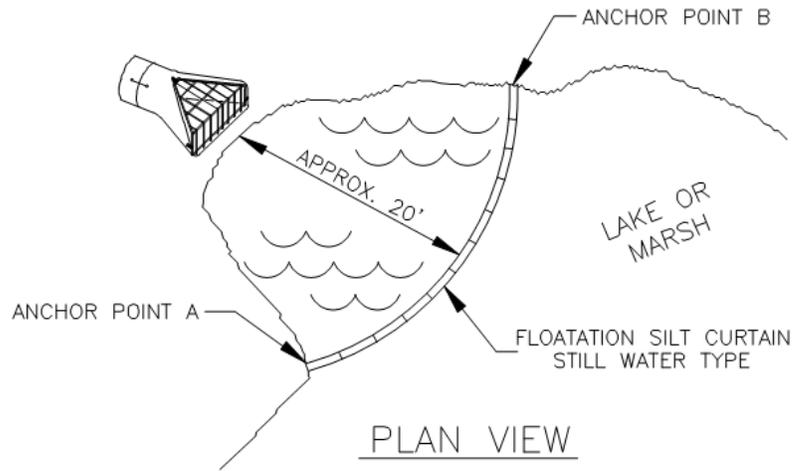
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1-18

CITY PL. NO.
ST-15
REVISED 3-16

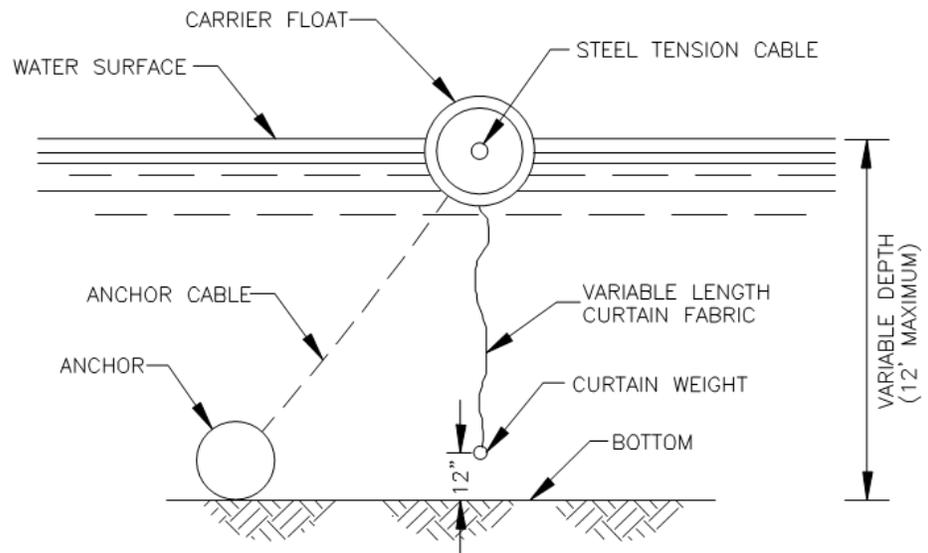


STANDARD DETAILS
TYPICAL RAIN GARDEN DETAIL
CITY OF PLYMOUTH

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1-18
CITY PL. NO.
ST-16
REVISED 3-16



PLAN VIEW



SIDE VIEW



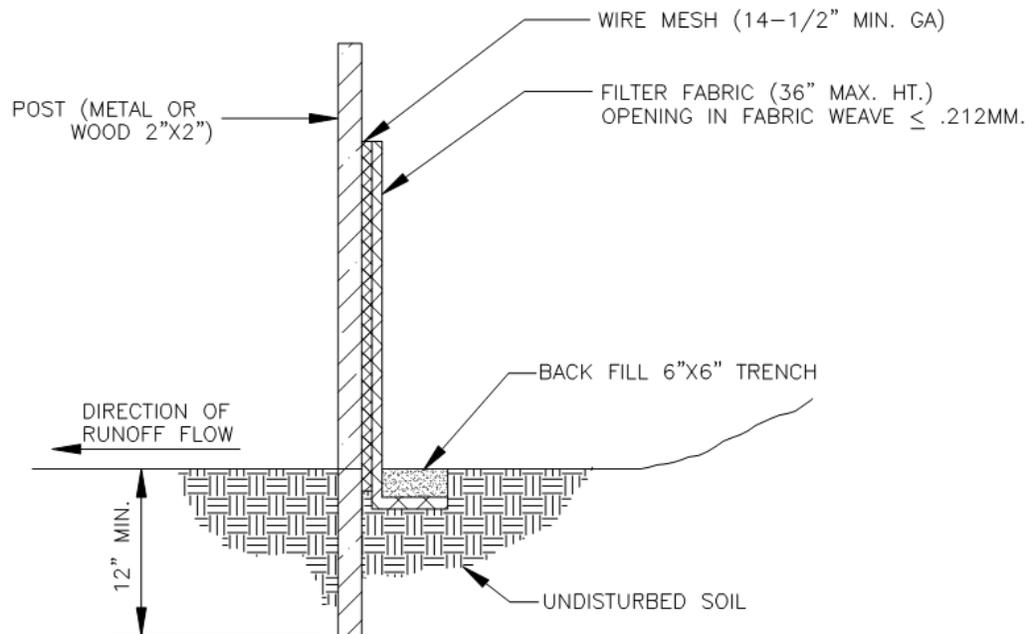
STANDARD DETAILS
 FLOATATION SILT CURTAIN DETAIL
 CITY OF PLYMOUTH

PUBLISHED
 1-18

CITY PL. NO.
 ST-17
 REVISED 3-16

NOTES:

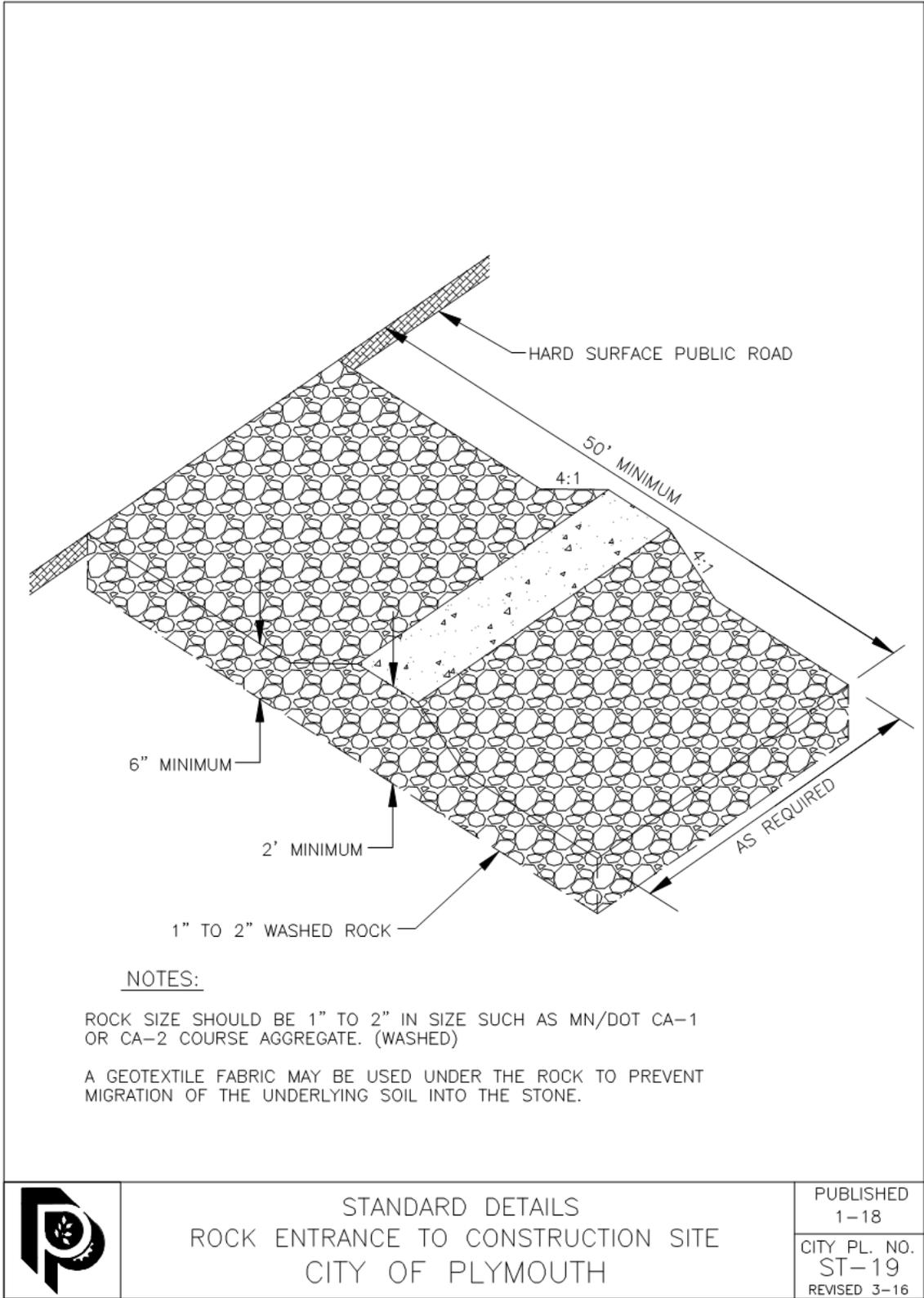
1. DIG A 6"x6" TRENCH ALONG THE INTENDED FENCE LINE.
2. DRIVE ALL POSTS INTO THE GROUND AT THE DOWNHILL SIDE OF THE TRENCH.
3. WIRE FENCING PER HENNEPIN COUNTY CONSERVATION DISTRICT EROSION AND SEDIMENT CONTROL MANUAL. WIRE MESH MUST BE A MINIMUM OF 2" INTO THE GROUND AND NO MORE THAN 36" ABOVE THE ORIGINAL GROUND SURFACE.
4. LAY OUT SILT FENCE ON THE UPHILL SIDE ALONG THE FENCE LINE, AND BACK FILL.
5. WOOD POSTS MAY BE SPACED UP TO 4 FEET APART IF WIRE MESH IS NOT USED TO SUPPORT THE FABRIC. IF WIRE MESH IS USED TO SUPPORT THE FABRIC STEEL POSTS MAY BE SPACED UP TO 8 FEET APART.
6. REMOVE SILT FENCE AFTER TURF IS ESTABLISHED.



STANDARD DETAILS
SILT FENCE DETAIL
CITY OF PLYMOUTH

PUBLISHED
1-18

CITY PL. NO.
ST-18
REVISED 3-16





SPECIFICATIONS:

MONUMENT

CONSISTS OF A POST AND A WETLAND BUFFER SIGN

WETLAND BUFFER SIGNS

PURCHASED FROM THE CITY OF PLYMOUTH,
COMMUNITY DEVELOPMENT DEPT.

MOUNTED FLUSH WITH THE TOP OF THE POSTS
FASTENED WITH NON-REMOVABLE SCREWS OR RIVETS

POST MATERIALS

4" X 4" SQUARE
TREATED WOOD OR OTHER CITY APPROVED MATERIAL

POST INSTALLATION

INSTALL POST PLUMB TO A HEIGHT OF FOUR FEET ABOVE GRADE.
SET AT LEAST 42 INCHES IN THE GROUND
INSTALLED AT EACH LOT LINE WHERE IT CROSSES A WETLAND BUFFER, WITH A MAXIMUM SPACING OF 200 FEET BETWEEN SIGNS (IF NO BUFFER IS REQUIRED, THE MONUMENT SHALL BE AT THE EDGE OF THE WETLAND)
PLACE ADDITIONAL POSTS AS NECESSARY TO FOLLOW BUFFER CONTOUR LINE



STANDARD DETAILS
WETLAND BUFFER MONUMENT
CITY OF PLYMOUTH

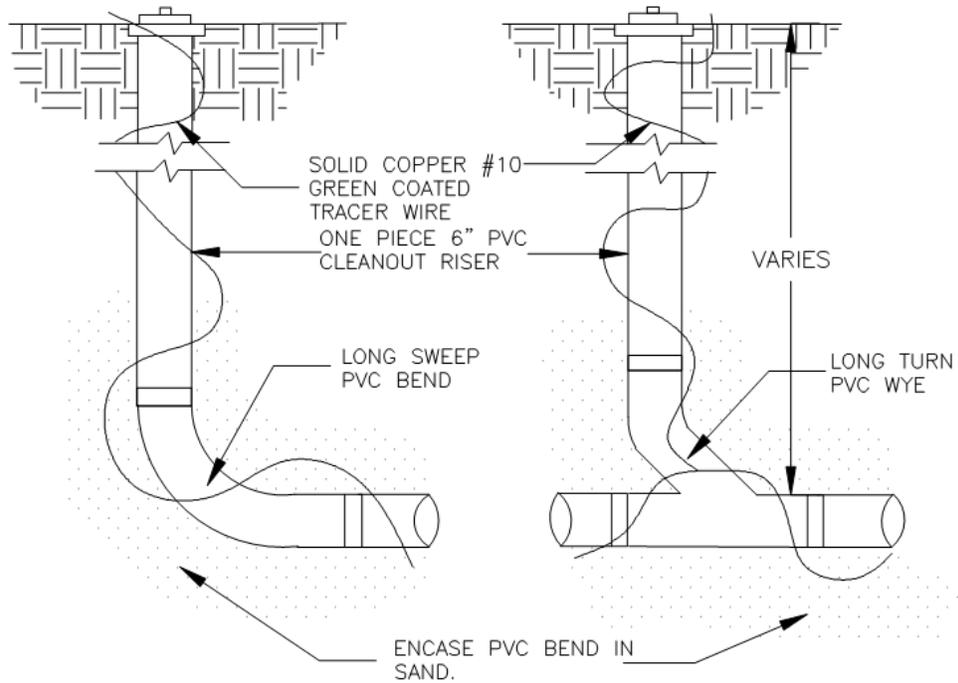
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1-18
CITY PL. NO.
ST-20
REVISED 3-16

NOTE:

- 6" HUB WITH THREADED PVC CAP, DO NOT GLUE.
- COVER WITH FORD METER BOX A-32 CASTING OR APPROVED EQUAL. SET COVER FLUSH WITH FINISHED GRADE AND PLACE TEMPORARY STEEL FENCE POST NEXT TO EACH CLEAN OUT.
- TERMINATE SOLID #10 GREEN COATED TRACER WIRE UNDER THE METER BOX CASTING AND INSIDE THE CATCH BASINS.
- CLEANOUTS AND ALL THE RELATED MATERIALS ARE INCIDENTAL UNLESS OTHERWISE NOTED.

NOTE:

- ENCLOSE LONG SWEEP BEND OR WYE IN AGGREGATE MATERIAL AS SHOWN.
- BENDS SHALL NOT BE GREATER THAN $22\frac{1}{2}$ DEGREES
- FLEXIBLY 6" DRAIN TILE MAYBE USED IN CIRCLES.



END OF
LINE
CLEANOUT

IN LINE
CLEANOUT



STANDARD DETAILS
PVC STREET DRAIN TILE CLEANOUTS
CITY OF PLYMOUTH

PUBLISHED
1-18

CITY PL. NO.
ST-21
REVISED 1-17



**STANDARD SPECIFICATIONS
FOR
STREET CONSTRUCTION**

CITY OF PLYMOUTH, MINNESOTA

JANUARY 2018

ENGINEERING DIVISION

3400 PLYMOUTH BLVD.
PLYMOUTH, MN USA 55447-1482
TELEPHONE (763) 509-5500

A handwritten signature in black ink, appearing to read 'Jim Renneberg', is positioned above the printed name.

Jim Renneberg, P.E.
City Engineer

These specifications are intended for inclusion into the contract documents. They only address the technical specifications and construction details of the referenced section.

**SECTION 02400
STANDARD DETAIL SPECIFICATIONS
FOR
STREET CONSTRUCTION
CITY OF PLYMOUTH, MINNESOTA USA**

JANUARY 2018

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MnDOT ADA Compliance Curb Ramp Check List

02401 SCOPE OF WORK

The work to be done under this contract shall include the furnishing of all labor, materials, tools and equipment to perform the grading, soil stabilization, placement of aggregate base, bituminous surfacing, concrete curb and gutter, sidewalk, trails and all appurtenant construction as shown on the drawings and as specified herein. Water applied for grading and compaction of base material shall be incidental to the placement. **NO CONCRETE WORK OR BITUMINOUS SURFACING SHALL BE PLACED BEFORE APRIL 15TH OR AFTER OCTOBER 31ST.** Bituminous or concrete installation after October 31st must receive approval from the City Engineer and if approved, the street warranty period will be extended one additional year for a total of two years. Any bituminous or concrete installed after October 31st that fails any test or inspection shall be completely removed and replaced as directed by the City Engineer.

02402 SPECIFICATIONS WHICH APPLY

All specifications contained herein, including attached detail drawings, together with the construction plans for the designated project or projects and including current versions of those portions of the following specification, as indicated by paragraph or designation number, shall apply: Minnesota Department of Transportation (MnDOT) "[Standard Specifications for Construction](#)" including Special Provisions and updates, unless noted otherwise.

In the above referenced MnDOT Specifications and the Special Provisions the word State shall also mean the City of Plymouth, Hennepin County, Minnesota, and Commissioner of Highways to read City Engineer or designee, City of Plymouth, 3400 Plymouth Blvd, Plymouth, Minnesota, 55447.

02403 STREET CONSTRUCTION MATERIALS

02403.1 SELECT GRANULAR BORROW -Materials

Select Granular borrow shall meet the requirements of MnDOT [3149.2B2](#). The contractor shall provide Certification of the materials being used and will be required to perform field sampling for gradation test of any bedding materials used as required by the City Engineer. Copies of test results shall be submitted to the City in a timely manner. The source of supply and quality of the material is subject to approval by the City Engineer or a designee, in accordance with MnDOT Specifications [1601](#) & [1603](#).

02403.2 GEOTEXTILE FABRIC (MnDOT [3733.1](#) Type V) -Materials

Geotextile shall be a woven, nonwoven, or knit fabric of polymeric filaments or yarns such as polypropylene, polyethylene, polyester, or polyamide formed into a stable network such that the filaments/yarns retain their relative position to each other. Knit fabric will only be allowed for use as perforated pipe wrap. The geotextile shall be inert to commonly encountered chemicals and shall be free of any chemical treatment or coating that might significantly reduce porosity or permeability. Geotextile shall be uniform in texture, thickness and appearance, and be free of defects, flaws or tears that would significantly alter its strength or filtering properties. All authorized repairs shall be completed to the satisfaction of the City Engineer or a designee. All rolls of geotextile or geotextile-wrapped perforated pipe shall be delivered to the Project with an opaque plastic covering to prevent degradation due to ultraviolet rays of the sun or contamination with mud, dirt, dust or debris. Rolled geotextile shall be identified by manufacturer,

product name, and roll number, both on the outside wrap and inside the core, as well as other requirements of ASTM D4873-02 (Identification, Storage, and Handling). Geotextile shall not be left exposed to the sun for a period in excess of 7 days without being covered by the appropriate protective soil or rock layer. The City Engineer or a designee may require replacement of any geotextile exposed to the sun for periods longer than 7 days or if the geotextile is contaminated with foreign matter. When a geotextile fabric is used for stabilization (Type V) or earth reinforcement (Type VI), the Contractor shall place the fabric with a 2 foot overlap at the seams.

02403.3 AGGREGATE BASE -Materials

The source of supply and quality of the material is subject to approval by the City Engineer or a designee in accordance with MnDOT Spec. 1601. The contractor shall provide Certification of the materials being used and will be required to perform field sampling for gradation test of any bedding materials used as required by the City Engineer. Copies of test results shall be submitted to the City in a timely manner. The subgrade stabilization rock for 3 Inch Recycle Minus shall be 70% passing 3", and 30% between 1 1/2" and 3". All Class 5 aggregate base shall be 100% crushed virgin quarry or mine rock conforming to MnDOT specification table [3138-1](#) or recycled per specification table [3138-2](#) can be used as aggregate base. However, the composite aggregate mixture/blend shall not contain sod, roots, plants, building rubble, building brick, wood, and plaster, reinforcing steel or other similar objectionable or deleterious materials and shall be free of lumps or balls of clay. Material quality from the source to be used must be demonstrated prior to use.

02403.4 CONCRETE -Materials

Concrete mix No. 3F52 MnDOT Specification [2461.2](#) shall be used for hand placed formed curb and gutter, medians, driveways, cross gutters, sidewalks, pedestrian ramps and medians. Concrete Mix No. 2F32, MnDOT Specification [2461.2](#) shall be used for an extrusion machine placement of concrete. In the production of concrete, an air entraining agent shall be added to the mix according to MnDOT Specification [2461.2](#).

Calcium chloride may be incorporated into the mix, **upon written permission of the City Engineer or a designee**, whenever the temperature may be expected to reach 50° Fahrenheit or lower during the 24 hour period following placement of the concrete. If Calcium chloride is used, it shall be introduced into the concrete mix as a slurry at the job site, allowing approximately one (1) minute mixing time. The quantity of calcium chloride added shall be determined by the City Engineer or a designee, but in no case shall it exceed two (2) percent of weight of the cement incorporated into the mix.

.4A ADMIXTURES FOR CONCRETE

MnDOT Specification [3113](#).

.4B CALCIUM CHLORIDE

Type 1 or 2, MnDOT Specification [3911](#).

.4C PREFORMED EXPANSION JOINT FILLER

MnDOT Specification [3702](#).

.4D MEMBRANE CURING COMPOUND

Type 2, white pigmented, MnDOT Specification [3754](#).

.4E FORM COATING MATERIAL

MnDOT Specification [3902](#).

.4F EPOXY COATED REINFORCING BARS

MnDOT Specification [3301](#)

02403.5 PLANT MIX BITUMINOUS PAVEMENT -Materials

Bituminous material shall conform to MnDOT Specification [2360](#). Final mix design and ADT estimate shall be approved by the City Engineer or a designee based upon the following.

New Construction:

- Medium volume roads (ADT >1000) - Wear course mix design shall be 2360 Type SPWEA340C
- Low volume roads (ADT <1000) - Wear course mix design shall be 2360 Type SPWEA240C
- Medium volume roads (ADT > 1000) - Base/Binder course mix design shall be 2360 Type SPNWB330C
- Low volume roads (ADT <1000) - Base/Binder course mix design shall be 2360 Type SPNWB230C

Overlays:

- Medium volume roads (ADT > 1000) - Wear course mix design shall be 2360 Type SPWEA340B
- Low volume roads (ADT <1000) - Wear course mix design shall be 2360 Type SPWEA240B

Driveways & Trails:

- 2360 Type SPWEA240B

02403.6 TACK COAT -Materials

Tack coat shall conform to MnDOT Specification 2357

02403.7 REFLECTORIZED PAVEMENT MARKINGS -Materials

.7A REFLECTORIZED PAINT

ReflectORIZED Paint, White or Yellow per MnDOT Specification [3501 & 3591](#).

.7B GLASS BEADS

Glass beads, moisture resistance, drop-on type for use with acrylic latex traffic marking paint to meet MnDOT Specification [3592](#).

.7C PLASTIC PAVEMENT MARKINGS

Preformed plastic pavement markings, white or yellow, 1.5 mm (60 mils) thick, shall be in accordance with the provisions of MnDOT Specification [3354](#).

02403.8 TRAFFIC SIGNS AND DEVICES -Materials

Street and traffic signs shall meet the requirements of MnDOT Specification [3352](#) for Standard No. 2 Reflective Sheet "3M" DG3 High Intensity", the Minnesota Manual on Uniform Traffic Control Devices, and Standard Detail Plates [STRT-20](#) through [STRT-24](#).

.8A FLANGED CHANNEL SIGN POSTS

The sign supports will be a U channel post, painted green. They will be punched with a 3/8" DIA. – 1" on center holes. The posts will be 2 & 3 Lbs. per foot and 6, 7 or 8 foot in length. All signs up to 18" shall be mounted on 2 U-Channel posts each 2 Lbs., one 7' long and one 6' long. The longer post shall be driven in the ground first. All signs up to 30" shall use an 8' – 3 Lb. post and a 7' -2 Lb. Post, with the 3 Lb. Post driven into the ground first. All signs over 30" shall use 2 sets of posts. (The heavier post placed in the ground first). All U-Channel posts will be driven 36" into the ground.

.8B SIGN POSTS

All sign posts located in concrete or bituminous areas shall use the "Minneapolis Style" sign post assembly as shown in Standard Detail Plate [STRT-22](#).

.8C BRACKETS

The marker bracket used shall be the "Lyle Sign" (E-Series) or approved equal. They shall have a galvanized 5/8" square center rod welded onto the tubular pole cap and will accommodate an ornamental nut on the top of the rod. Star shaped center clips will be used to accommodate facing the sign at different angles (See Standard Detail Plate [STRT-23](#)). The top nut, plate holder and post cap shall be green. Sign mounting brackets shall be "Earl F Anderson's" (BR-5 series) aluminum brackets or approved equal.

.8D MARKERS

Street name sign materials (markers) shall be "Lyle Sign" E-Series or approved equal. The markers are to be a .080 inch minimum thickness flat aluminum plate, single-faced, fully reflectorized with "3M" DG3 high intensity reflective sheeting. The size is to be 9 inch plates with 6 inch, upper case letters or numbers (suffixes such as: TH, ND, etc., will be 4 inch letters in upper case). No more than three blades per pole shall be used.

The markers will have white letters or numbers and border, on green background. All streets that are private will be marked by reversing the colors (green letters on a white background). Series "C" letters shall be used for all markers. If sign exceeds 48" in length, "B" series letters may be used.

Note: If the street markers are damaged during the course of construction, it will be the responsibility of the developer to replace it. The City will assume ownership when the project has been accepted by the City and the financial guarantees have lapsed.

.8E TUBULAR POLES

Tubular poles will be galvanized with a minimum wall thickness of .080 inch. The pole shall have a 2-3/8" outside diameter. The tubular pole will be either 10' or 12' long. A 12' tubular pole will be used for locations where a stop sign is planned or anticipated. The stop sign will be mounted on the same tubular pole as the street marker. The City will determine the locations where stop signs may be installed.

All tubular poles will be placed in an auger drilled, 36" deep x 10" diameter concrete footing. At one interval on the tubular pole, either the pole shall be crimped or doweled to prevent the pole from turning in the concrete footing. The placement of the tubes will vary depending on conflicts with utilities or other obstacles. All poles should be placed in the boulevard area 6' behind the back of the curb. If this cannot be accommodated, placement of the tube should be as close to this requirement as possible.

The City will approve all materials, sign names and locations prior to installation. Submit shop drawings for review and approval. No more than three street name signs can be placed on any single pole assembly.

It will be the responsibility of the installer to have all underground utilities located prior to starting installations.

02403.10 TRUNCATED DOMES FOR PEDESTRIAN RAMPS –Materials Neenah Foundry Company, East Jordan Iron Works or approved equal from the [MnDOT's approved products page](#), charcoal grey coated cast iron truncated dome panels shall be used for all pedestrian ramps. Use only one supplier of panels within a project. See Standard Detail Plates STRT-3 through STRT-8.

02404 CONSTRUCTION REQUIREMENTS

02404.1 WORKING HOURS –Construction Requirements

The City Engineer or a designee shall be notified at least 48 hours prior to commencing any work. Phone # (763) 509-5500. Contractors are subject to being shut down and or having work rejected if proper notification is not given to the City.

Work shall not commence before 7:00 a.m. nor extend beyond sundown Monday through Friday. On Saturdays, work hours are from 8:00 a.m. to 6:00 p.m. No work is permitted on Sundays or Holidays unless authorized by the City. Existing roadways shall not be restricted between 7 & 9 AM and 3 & 6 PM unless approved by the City Engineer.

The definition of "Work" also includes the starting of equipment and the delivery of materials to the job site.

02404.2 EXCAVATION –Construction Requirements

Roadway excavation shall be performed in accordance with the provisions of MnDOT Specification [2105](#) except as modified below:

The Contractor shall eliminate any and all top soils organic material and non-granular soils from the "subgrade", as directed by the City Engineer or a designee and defined herein as that material below the bottom of the selected granular base material and excavation and fill sections. (Refer to typical sections). Suitable topsoil, (not including sod), which is encountered during excavation may be stockpiled and used as backfill material behind the curb where directed by the City Engineer or a designee. Stockpile locations are to be provided by the Contractor with the approval of the City Engineer or a designee.

During construction, all excavation shall be maintained in such a condition that they will be well drained at all times. Temporary ditches or gutters shall be constructed when necessary to maintain drainage and avoid damage to the roadway and existing utilities. No excavated material shall be placed or stockpiled in such a manner as to restrict free surface drainage of the subgrade or base courses. The Contractor shall remove and replace existing signage, guard posts and mail boxes as required. The Contractor shall also install erosion protection devices according to the erosion control plan and or as directed by the City Engineer or a designee.

02404.3 EMBANKMENT –Construction Requirements

Roadway embankment shall be performed in accordance with the provisions of MnDOT Specification [2105](#) except as modified below:

Material for embankment shall be obtained from common excavation unless otherwise specified in the special conditions or directed by the City Engineer or a designee.

The material used for embankment material may be from excess common excavation material as directed and approved by the City Engineer or a designee. If the required amount of material is more than can be obtained from excess common excavation, the Contractor shall provide additional material from outside sources subject to the approval of the City Engineer or a designee. This material shall be in accordance with MnDOT Specification [2105.2B](#) (CV). All roadway embankments shall be thoroughly compacted in accordance with MnDOT Specification [2105.3F1](#) "Specified Density Method" unless specifically provided otherwise in the Special Conditions.

"Where this method is specified, the Engineer will sample and test the soils that are to be used, to determine the maximum density and Optimum Moisture, and will make density and moisture tests on the compacted embankment, using methods described in the MnDOT Grading and Base Manual.

*The upper **3 feet** of the embankment, together with those portions of the embankment that are below the upper **3 feet** but that are adjacent to structures and are subject to the same maximum layer thickness as the upper **3 feet**, shall be compacted to a density of not less than 100 percent of maximum density. Those portions of the embankment that are below the upper **3 feet** and that are not adjacent to structures shall be compacted to a density of not less than 95 percent of maximum density.*

At the time of compaction, the moisture content of the embankment material shall be not less than 65 percent nor more than 115 percent of Optimum Moisture where 95 percent of maximum density is required and shall be not less than 65 percent nor more than 102 percent of Optimum Moisture where 100 percent of maximum density is required."

Subsequent to subgrade preparations and prior to placement or construction of roadbed base material in areas where concrete curb and gutter is to be placed, all backfilling behind the curbing shall have been completed. Any damage inflicted on the subgrade or new construction while placing the embankment shall be

repaired by the Contractor at his or her expense. All embankments shall be completed prior to any excess suitable material being disposed of.

02404.4 SUBGRADE PREPARATION –Construction Requirements

Subgrade preparation shall be performed in accordance with the provisions of MnDOT Specification [2112](#) except as modified below:

Subgrade preparation shall entail the final shaping and compaction of the subgrade to plus or minus 0.05 feet of proposed elevation and cross section.

Any soft spots or displacements which appear during subgrade preparation shall be corrected by scarifying, aerating, or watering and re-compacting as required to obtain stability or by excavating to solid material and backfilling with material suitable for base construction. Unsuitable material, such as vegetation, rubbish, large stones, peat, and wet clay shall be removed and disposed of as directed by the City Engineer or a designee. After correction, the area shall be test rolled as directed by the City Engineer or a designee.

Any further roadway work after subgrade preparation may only proceed when all the utility testing has been complete.

02404.5 GEOTEXTILE FABRIC –Construction Requirements

Commence installation of geotextile fabric after material has been approved by the City Engineer or a designee and the preparation of the sub-grade has been completed. Install geotextile fabric to the complete limits of the roadway sub-grade including intersections and turning lanes or as directed by the City Engineer or a designee. Unroll geotextile fabric as smooth as possible on the prepared sub-grade in the direction of the construction traffic. Install geotextile fabric in the longest continuous practical length, free from tension, stress, folds, wrinkles and creases. Install geotextile fabric in accordance with this specification and procedures recommended by the manufacturer. Overlap joints a minimum of 2 feet. Install pins or place piles of sub-base material as required to hold geotextile fabric in place. Cut or fold geotextile fabric to conform to curves. Place geotextile fabric to ensure it does not extend more than (4) inches over the sub drain trench. Construction vehicles shall not be permitted to drive on the geotextile fabric. Remove or replace geotextile fabric improperly installed or damaged as directed by the City Engineer or a designee.

02404.6 AGGREGATE BASE -Construction Requirements

Place aggregate in layers to produce a maximum 3" of compacted thickness. With vibratory compaction, place the produce to a maximum 6" of compacted thickness. Deposit only the amount of aggregate which is intended to be spread and compacted during the same day. Add water as may be required during mixing to produce proper compaction. Replace aggregate for existing gravel driveways with a minimum of 6" or match existing thickness, whichever is greater. Mix aggregate uniformly to maintain proper gradation. Spread and compact each layer to the required cross-section and density prior to placing a succeeding layer. Compact each layer until no visible evidence of further consolidation and to a density not less than 100% of standard proctor density using a steel-wheeled or pneumatic tired roller and a water truck. Construct each course to within 0.05' of the planned grades and staked elevations at all locations. The ENGINEER must be present during tolerance in order to accept the work, but it is the CONTRACTORS responsibility to ensure the acceptable tolerance.

02404.7 CONCRETE CURB, AND FLAT WORK –Construction Requirements

02404.7A BASE PREPARATION FOR CONCRETE

The base for curb and gutter, medians, driveways and sidewalk shall be constructed of materials as shown on the plans and details and shall be well drained and compacted with an approved vibratory compactor to a firm surface with a uniform bearing power. It shall be thoroughly wet down so as to be in a moist condition when the concrete is placed.

02404.7B CONCRETE CURB

Concrete curbing shall be in conformance with MnDOT Specification [2531](#) using B612, B618 or City standard Surmountable type. See Standard Detail Plate [Detail STRT 1](#).

Two (2) No. 4 epoxy coated reinforcing rods [MnDOT Specification 3301](#), shall be placed in the lower portion of the curb twenty feet (20') in length at all sewer and water service trenches, fire hydrant leads and other sewer and watermain trenches. Two (2) ten (10) foot or longer No. 4 epoxy coated reinforcing rods shall also be placed on each side of all catch basins. (See Standard Detail Plates ST-5 & [Detail STRT 1](#)).

All initial curbs shall be placed using "Slip Form Machine Placement" except at structure "fill ins", where the radius is too tight for the machine or as directed by the City Engineer or a designee.

02404.7C CONCRETE SIDEWALKS AND PEDISTRIAN RAMPS

Concrete sidewalk pedestrian ramps shall be in conformance with MnDOT Specifications [2521](#) & [2531](#) using a 3F52 mix, being a minimum of 5 foot wide and 4" thick standard. Where sidewalk crosses a residential driveway it shall be 6" thick. Where the sidewalk crosses a commercial or private road it shall be 8" thick minimum. See Standard Detail Plate [STRT-10](#).

Sidewalks and pedestrian ramps shall be constructed on a 4" thick aggregate base using either CL 5 aggregate base per the detail plate [STRT-10](#). Concrete pedestrian ramps shall be constructed to conform to MnDOT details [STRT-3](#) through [STRT-7](#).

Complete the [MnDOT ADA compliance Checklist](#) for Curb Ramps for each pedestrian ramp that is installed. The form is included along with the details at the end of this specifications.

02404.7D CONCRETE FINISHING

Concrete shall be struck true to cross section as shown on the plans. No additional water may be added to aid in the finishing process. A light broom finish will be required at right angles to the center line on all concrete work unless directed otherwise. All exposed edges and joints in curb, gutter, sidewalk and steps shall be rounded with a suitable edging tool. Before final finishing, the Contractor shall check the concrete with a ten (10) foot steel straight edge to ensure there is no variation greater than 3/16" from the straight edge on tangent lines or grades. If deviations greater than 3/16" are found the work will be considered as unacceptable and will be required to be removed and replaced at no expense to the OWNER.

02404.7E CONCRETE CURING

Curing shall be performed by applying a membrane curing compound (Type 2, white pigmented, MnDOT Specification [3754](#)) to the exposed surface of the concrete within one (1) hour after finishing the concrete surfaces. When the forms are removed in less than 72 hours after placing the concrete, the curing compound shall be applied immediately to the exposed surfaces, or the trenches shall be backfilled immediately with suitable backfill material. The rate of application of curing compound shall be 150 square feet per gallon. The compound shall appear as white as a sheet of paper after application on the concrete surface.

[MnDOT 2531.3 G.3](#) "Protection against Cold Weather

If the national weather service forecast for the construction area predicts air temperatures of 36 °F [1 °C] or less within the next 24 hours and the Contractor wishes to place concrete, submit a cold weather protection plan. Protect the concrete from damage including freezing due to cold weather. Should any damage result, the Engineer will suspend operations until the Contractor takes corrective action, and may subject the damaged concrete to [1503](#), Conformity with Contract Documents, and [1512](#), Unacceptable and Unauthorized Work."

02404.7F CONCRETE CONTRACTION/EXPANSION JOINTS – Construction Requirements

Preformed expansion joints shall meet [MnDOT specification 3702](#), and shall be provided at the following locations:

- At the beginning and end of all curb and gutter radii.
- Where new concrete surrounds, adjoins, or abuts any existing fixed objects such as fire hydrants, building foundations, concrete driveways, sidewalks, and other rigid structures.
- After each load of concrete when placing curb and every 100 feet when placing sidewalk.

Contraction joints will not be sealed but will be required at a spacing of 10 feet on curb and gutter and 6 foot spacing on sidewalk construction. Contraction joints will be cut to a depth 1/3 the thickness of the concrete, surface and back of all curbs. Contraction joints shall be placed so that no slab is larger than 100 square feet in area. The contractor is responsible for constructing contraction joints that prevent concrete from cracking at other locations.

02404.7G CONCRETE DIMENSIONS AND STRENGTH REQUIREMENTS –Construction Requirements

02404.7G1

Concrete sidewalk will be (5') wide and a minimum of four (4") thick with the exception of a six (6") thickness requirement through residential driveways, and eight (8") thickness requirements through industrial/commercial driveways, unless specified otherwise on the plans or Special Conditions.

Concrete sidewalk steps shall be equal in width to the existing or new sidewalk. Residential concrete steps shall have an eight (8") rise per

step and a nine (9") tread and commercial concrete steps shall have a seven (7") rise per step and an eleven (11") tread.

02404.7G2

Random concrete cylinders will be taken for 7 & 28 day compression strength tests at the rates addressed in the testing portion of this specification. Prior to final acceptance of the work, the City may take cores at random at any suspected weak spots from the concrete to determine thickness and strength.

Where the compressive strength is less than 4500 p.s.i. for 3F32 & 3F52 mixes, after 28 days, the City will designate whether or not such defective concrete must be removed and replaced at the Contractor's expense. Where the concrete strength is less than 4500 p.s.i., additional cores shall be taken at the Contractor's expense to determine the extent of such deficiency.

02404.7H EXISTING CONCRETE REMOVALS

Replace sections of concrete curb and gutter within 48 hours of removal. Friday removals should be avoided unless they can be replaced that same day.

Completely remove concrete as marked by the ENGINEER.

A clean, vertical edge, approved by the ENGINEER, is required for all removals.

Sawcut curb to at least 1/2 the curb thickness where 1/2 or more of the existing curb section does not require removal.

Sawcut concrete at locations directed by the ENGINEER to provide a clean joint or limit removal.

Protect concrete not designated for removal.

Protect landscaping adjacent to concrete removed. Replace disturbed landscaping in kind. Landscaping restoration shall be considered incidental to curb placement.

Protection including temporary relocation of mailboxes and posts to facilitate construction is incidental to curb installation unless otherwise noted. Damaged mailboxes will be replaced by the CONTRACTOR at the CONTRACTOR'S expense.

02404.8 BITUMINOUS PAVEMENT –Construction Requirements

02404.8A RESTRICTIONS –Construction Requirements

Bituminous surfaces shall be placed and rolled only during daylight hours and over a dry road surface.

MnDOT 2360.3 D.2.c Mixture Temperature

Refer to Table 2360-26, —Minimum Temperature Control for the minimum laydown temperatures in all courses of the asphalt mixture as measured behind the paver or spreading machine. Do not pave when the air temperature is less than 32° F [0° C] unless otherwise directed by the Engineer in writing.

Air Temperature, °F	Compacted Mat Thickness, †			
	1 in	1½ in	2 in	≥3 in
32 – 40	—	265	255	250
41 – 50	270	260	250	245
51 – 60	260	255	245	240
61 – 70	250	245	240	235
71 – 80	245	240	235	235
81 – 90	235	230	230	230
≥ 91	230	230	230	225

* Not applicable if using a Warm Mix Asphalt (WMA) additive or process that meets the requirements in 2360.2.C.4.
 || Use at least one pneumatic-tire roller for intermediate rolling unless otherwise directed by the Engineer. The Engineer may specify or modify the minimum laydown temperature in writing.
 † Based on the lift thicknesses shown on the plans.

Under no circumstances will bituminous wear be allowed to be placed until all gate valves can be keyed and all valve boxes and manholes castings have been raised. Mixture shall not be placed when, in the opinion of the City Engineer or a designee, the weather or roadway conditions are considered unfavorable.

Final wear course placement will be allowed in a new housing development only after one freeze – thaw cycle and after 75% of all units have been issued a certificate of occupancy (C.O.). Placement of wear course on non-housing projects shall be after one freeze – thaw cycle or by the direction of the City Engineer. An inspection of the roadway will be performed by the City Engineer or a designee prior to wear course placement. From this inspection, any deficiencies or damage to the street, sidewalk and curb will be noted and will need to be corrected prior to the placement of the wear course.

- 1) The developer after the first freeze the cycle and upon approval of the City Engineer, may pave the final wear course prematurely provided the street line items in the developments "Letter Of Credit" remains at 80% of their original amount until they are accepted. The streets acceptance process will remain unchanged and begin once 75% of the development units have a C.O. An inspection of the roadways, sidewalks and trails will be performed at that time and any repairs found, be corrected. If more than 50% of the curb is replaced, per specification section [\(2404.15J\)](#) we will also require that all the wear course be milled off and all the curb and wear course be replaced.

02404.8B BASE PREPARATION –Construction Requirements

Final shaping and compaction of the aggregate base shall be done just prior to construction of the plant mix bituminous surface. The finished surface of the base shall show no variation greater than 1/2 inch from a ten (10) foot straight edge laid parallel or perpendicular to the center line of the roadway.

02404.8C PLACEMENT OF PLANT MIX BITUMINOUS SURFACE –Construction Requirements

Mixture shall be spread without segregation, at the specified rate to the cross section shown in the plans and per MnDOT Specification [3151](#). See Standard Detail Plate [STR-14](#).

The thickness of each bituminous course shall be within 1/4 inch of the thickness as shown on the plans. The total thickness of all bituminous courses shall be within 1/2 inch.

Adjust all surface courses to not greater than 1/4" above adjacent curb front edges, or 1/2" above manhole frames, valve boxes or other fixed structures.

Prior to constructing the bituminous binder and/or wearing courses, the Contractor shall sweep the streets. The sweeper shall be a self-propelled pick-up (with water) sweeper. A side-throw sweeper will not be allowed.

All areas to be patched with bituminous wear course shall be saw cut. All areas to be patched in the base course can be either saw cut or jack-hammered out. A minimum of 12" shall be maintained around structures and only square or rectangular shaped areas are acceptable. Bituminous patching shall be done in lifts not to exceed 3 inches per lift. A vibratory compactor shall be used.

All manholes, gate valves, catch basins, etc. shall be covered to prevent adherence of the bituminous. Suitable covering includes plywood disks, or other approved methods. Castings and pick holes shall be clean of bituminous after each paving operation.

02404.8D COMPACTION –Construction Requirements

All pavements will be compacted in accordance with MnDOT Specification [2360.3.D.1](#) "Maximum Density Method" unless otherwise specified in the Special. After compaction, the thickness of each course shall be within plus or minus 1/4" of the thickness shown on the plans for that course.

02404.8E CONSTRUCTION JOINTS –Construction Requirements

The longitudinal joint in the center of the road will be made last and shall overlap any previous laid bituminous course longitudinal joint by at least six (6) inches. Transverse joints in adjacent strips shall be separated by a minimum of five (5) feet. Connections to an existing asphaltic mat shall be allowed only after the existing mat has had a vertical joint prepared for final connection. This joint shall be constructed by milling the existing surface in accordance with MnDOT Specification [2232](#), mill pavement surface. The milled horizontal distance into the existing bituminous shall be at least 6" in width and 2" in depth. Any other method in providing the connections shall first be approved by the City Engineer or a designee. All costs for milling operations shall be considered incidental to the paving costs.

02404.9 TACK COAT –Construction Requirements

Coordinate application to allow traffic movement in at least one direction without pick-up or tracking. Provide warning signs indicating "FRESH OIL" if bituminous is not to be placed immediately after tack coat has been applied. Limit application to only the area on which the subsequent course will be placed on the same day. Areas not paved on the same day will have to be re-tacked with no additional compensation.

The contact surfaces of curbs, concrete pavement or other fixed surfaces, and transverse joints shall be sprayed with a uniform coat of tack coat material. The rate of Tack coat application shall be per MnDOT specification [2357.3 D table 2357-2](#). Apply on a clean surface with all preparation work completed prior to placement. Protect adjacent curb and gutter, sidewalk and other exposed surfaces from overspray. Do not apply during or immediately prior to precipitation. Do not apply to wet surfaces. Sand applied at pedestrian crossings will be considered incidental. Protect tacked surfaces from dust, debris and water. Apply materials with a distributor meeting the requirements of MnDOT [2360.3.B.2.d](#). Temperature of the material at application shall be in accordance with MnDOT [2357.3.E](#).

02404.10 REFLECTORIZED PAVEMENT MARKINGS

–Construction Requirements

02404.10A PREPARATION OF PAVEMENT

At the time of applying the marking material, the application area shall be dry and free of all contamination, including oil, dirt, grease, curing compound and other matter that might adversely affect adhesion or durability of the marking material. Cleaning shall be accomplished with rotary brooms, air blast, hand brooms, scrapers or whatever combination of equipment that is necessary to produce a clean surface without damage. Particular care shall be taken to remove vegetation and soil from the areas to be edge striped. Should other methods fail, hand scraping or brushing will be required to secure an acceptable surface.

02404.10B APPLICATION EQUIPMENT – PAINT

Application equipment for painted markings shall consist of a machine of the spray type capable of applying the paint under pressure at a controlled temperature through nozzles equipped with remotely controlled cut-off mechanisms and suitable line guides that will produce clean cut lines and prevent excessive paint drift. Except where the use of portable sprayers is specifically approved by the City Engineer or a designee, the marking stripes shall be applied with truck mounted traveling units properly equipped to apply the paint stripes as required. Where two or more lines are to be applied at closely controlled spacing (such as double solid lines), the machine shall be equipped to apply those stripes simultaneously. For application of skip lines, the spray unit shall include an automatic control device capable of being set to produce the specified stripe to gap ratio.

The paint tanks mounted on the traveling unit shall have provisions for continuous agitation and mixing for the marking material during application. If necessary to maintain uniform flow and application, the paint tank shall be equipped with heating facilities capable of heating and automatically controlling the paint temperature within acceptable limitations as recommended by the paint manufacturer.

02404.10C METHOD OF APPLICATION – PREFORMED PLASTIC PAVEMENT MARKINGS

Prefomed plastic markings shall be in accordance with MnDOT Specification [3354](#) and inlaid as recommended by the material manufacturer at the locations indicated on the plans or specifications. The Contractor shall use a certified installer of the pavement marking material.

02404.10D PROTECTION OF TRAFFIC AND MARKINGS

Furnish and install all necessary warning and directional signs and devices in order to maintain traffic wherever pavement markings are applied in the presence of traffic, and to protect uncured markings as needed without damaging markings. When necessary, a pilot car and flaggers shall be used to provide adequate control and direction of traffic. Warning signs and barricades shall be placed only where marking operations are in progress, shall be relocated as often as necessary, and shall not be left in place overnight. Traffic shall be allowed to keep moving at all times and the striping equipment shall be operated in a manner that will not make it necessary for traffic to cross uncured markings. Protective devices such as "cones" shall be of an approved type that will not cause damage to the vehicle when accidentally struck. Protect traffic and markings in accordance with applicable details of the Field Manual.

02404.10E RESTRICTIONS

Painted pavement markings shall only be applied in seasonable weather when the air temperature is 50° F. or higher and shall not be applied when there is any moisture on the pavement surface or when the wind or other conditions cause a film of dust to be deposited on the pavement surface after cleaning and before the marking material can be applied.

The filling of paint tanks, pouring of paint or cleaning of equipment shall not be performed on unprotected pavement surfaces unless adequate provisions are made to prevent spillage of paint.

Application of pavement markings during hours of darkness will only be allowed after approval of the City Engineer or a designee. On pavements open to traffic, the work may be suspended by direction of the City Engineer or a designee during peak traffic hours or at any other time traffic is being unduly hampered or delayed by the work in progress.

02404.11 TRAFFIC SIGNS AND DEVICES –Construction Requirements

Traffic signs including street name, warning and regulatory signs shall conform to the [MN MUTCD](#) manual. See detail plates STRT21 through STRT-27 for further information. New traffic and street signs shall be installed in new developments once the roadways are in service. If a delay is anticipated in installation of the permanent signs, temporary sign shall be installed in the interim at the contractor’s expense.

02404.12 TRAFFIC CONTROL AND DETOURS –Construction Requirements

All traffic control shall be in conformance with the Minnesota Manual on Uniform Traffic Control Devices ([MN MUTCD](#)), "[Temporary Traffic Control Zone Layouts Field Manual](#), Current Edition" and or as directed by the City Engineer or a designee.

Traffic control plans shall be submitted to the City Engineer or a designee for approval prior to implementation. Closures and Detours need 10 working days minimum prior notice before they can be implemented. Contact the City Engineering Division at (763) 509-5500 for assistance in implementation of an approved plan.

02404.13 TRAILS AND PARKS –Construction Requirements

Soil sterilants shall be used where necessary under the trails as determined by the Parks and Recreation Department. All trees, stumps, brush, etc., shall be cleared out within four (4) feet of the edge of the trail, except for hardwood trees or others that the plan shows to remain. Trails are to be installed when the adjacent street is constructed. Two rolls of sod will then be placed along both sides of the trail. See Standard Detail Plate [STRT-15](#).

02404.14 RESTORATION –Construction Requirements

All seeding and sodding shall be performed in conformance with MnDOT Specification [2575](#) (Establishing Turf and Controlling Erosion). All disturbed areas must be covered by a minimum of 4" of topsoil, free of unsuitable materials, prior to turf establishment. Slopes steeper than 4:1 shall be stabilized with wood fiber blanket in accordance with MnDOT Specification [2575.3K2](#).

02404.15 CRITERIA FOR DAMAGED CONCRETE CURB, AND FLAT WORK REPLACEMENT FOR NEW STREET WARRANTY WORK –

Construction Requirements

The following criteria shall be used to determine concrete curbing and flat work that must be removed and replaced prior to wear course paving. Its primary use is for the markup of damaged curb or sidewalks that are in a new residential development. It can be referenced for use on any project at the engineer's discretion. City staff will mark all the concrete sections that need to be removed and replaced. All concrete areas must be clean prior to inspection and marking.

Glossary

Control Joints: Expansion and contraction joints installed by the contractor during curb and sidewalk construction.

Gouges: Portions of concrete that are missing due to damage to the curb section during or subsequent to curb construction. Gouges shall be measured from the front edge, back edge or top of curb to the maximum projection of the gouge both into and along the curb section.

Flat Work: Includes sidewalks, aprons, driveways, cross gutters and medians.

CURB AND FLAT WORK DAMAGE CRITERIA

.15A All curb and flat work panels that have visible cracks at locations other than control joints shall be replaced. (No Saw & Seal)

.15B All curb and flat work panels that have settled shall be replaced. (No mud jacking will be allowed)

.15C A minimum of two consecutive non-damaged curb or flat work panels is required between panels identified for replacement; i.e. a non-damaged panel between two damaged panels shall also be identified as damaged curb and shall be replaced.

.15D All curb and flat work replacement shall be full panels unless otherwise directed by City Engineer.

.15E Horizontal or vertical alignment offsets of curb and flat work panels at control joints greater than 3/8" will require curb replacement to correct the offset.

.15F Curb and flat work panels with street side/front edge damage shall be removed and replaced if the damage meets the following criteria:

- Curb and flat work with horizontal gouges greater than 1" from the street edge regardless of vertical gouge depth.
- Curb and flat work with horizontal gouges between 1/2" and 1" from the street edge with a cumulative length along the curb panel greater than 6" regardless of vertical gouge depth.

.15G Curb panels with house side/back edge damage, adjacent driveways or other hard surfaces, shall be removed and replaced if the damage meets the following criteria:

- Curb with horizontal gouges greater than 1" from the curb edge regardless of vertical gouge depth
- Curb with horizontal gouges between 1/2" and 1" from the curb edge with a cumulative length along the curb panel greater than 6" regardless of vertical gouge depth.

.15H Curb panels with house side/back edge damage, adjacent sod/landscaped areas, shall be removed and replaced if the damage meets the following criteria:

- Curb with horizontal gouges 2" or greater from the curb edge regardless of vertical gouge depth.
- Curb with horizontal gouges between 1" and 2" from the curb edge with a cumulative length greater than 1' regardless of vertical gouge depth.

.15I Curb and flat work panels with top surface damage shall be removed and replaced if the damage meets the following criteria:

- Curb and flat work with vertical gouges or scrapes 1" or greater regardless of horizontal length.
- Curb and flat work with vertical gouges or scrapes between 1/2" and 1" with a cumulative horizontal length greater than 1'.

.15J Partial curb panel replacement shall not be allowed if the percentage of curb panels to be replaced exceeds 50% of the total curb length of each block. When the amount of curb damage exceeds 50% of the total block curb length, 100% of that's block's curb must be removed and replaced per City standards. The City reserves the right to determine the street segment or length to which the 50% rule will be applied.

02405 TESTING

The City shall be copied on all test reports. Samples shall be taken in rates called out in this section or as directed by the City Engineer or a designee or addressed in the special provision for this project. All testing will be considered incidental unless otherwise noted.

02405.1 SOILS TESTING

Soil tests required to determine 20-year pavement design. Unsuitable soils shall be excavated and recommendations made for the necessary corrective work. See Standard Detail Plate [SRT-14](#).

02405.2 COMPACTION TESTING

Compaction tests on sub-grade and base courses shall be in accordance with MnDOT Specification [2105.3F1](#).

02405.3 TEST ROLLING

Test rolling shall be performed in accordance with the provisions of MnDOT Specification [2111](#) except as modified below.

Perform test rolling after subgrade or aggregate base is established to the proposed width and is within specified tolerance of the staked grades at all locations. Test rolling will be required on all new street sub grades prior to placement of the roadway structural section. On roadway reconstruction projects the Engineer will decide whether to test roll the subgrade or aggregate base. Test rolling may also be required on bituminous or concrete trails and sidewalks. This will be determined in the field by the City Engineer or a designee prior to placing the trail or sidewalk section. The City Engineer or a designee, Project Engineer designee and a Soils Engineer shall be present to witness the test. The Contractor shall provide a loaded tandem axle truck with a minimum gross weight of 25 tons. The Contractor shall provide a weight ticket for the test roll vehicle to the City Engineer or their designee prior to the test roll.

The test rolling shall be at the direction of the City Engineer or their designee. A Soils Engineer will be present during test rolling and provide a written certification to the City that the test passed or what corrections or recommendations are necessary if there is a failure. The City may also require test rolling of the aggregate base, once the base section has been constructed.

The City Engineer or a designee may require a subgrade stabilization, geotextile fabric, or subgrade excavation where poor subsoils exist. The Contractor's Soils Engineer shall evaluate these conditions, and a recommendation made to the Engineer. The expense of test rolling shall be incidental to construction of the roads or walks unless otherwise modified in the contract documents.

Protect all culverts and other structures during test rolling. Provide additional cover as required over in place structures as protection during test rolling. Replace structures damaged during test rolling.

After completing the test rolling, heavy traffic shall be prevented from using the subgrade until it is covered with the required sand and aggregates. Truck traffic shall not use the subgrade when delivering the sand and aggregate to construct the road section. All loads shall be dumped, pushed and spread over the newly prepared and tested subgrade.

02405.4 AGGREGATE AND BITUMINOUS TESTING

Roadway aggregate gradation testing shall be as specified in MnDOT Specification [2211](#). One test for gradation for each 500 tons of material delivered. All bituminous testing shall be in accordance with MnDOT Specification [2360](#). The test procedure shall be the Quality Assurance (QA) method for streets, and the Quality Control (QC) method for patching, driveways, parking lots, and trails. The contractor shall provide an independent, MnDOT trained and certified, testing company to provide QA testing for the Engineer. All testing shall be paid for by the contractor.

02405.5 CONCRETE AIR TESTING

Concrete Air - in accordance with MnDOT Specification [2461](#) Test the first load of the day and one test per every 100 cubic yards placed thereafter.

02405.6 CONCRETE SLUMP TESTING

Concrete Slump - in accordance with MnDOT Specification [2461](#) Test the first load of the day and one test every 100 cubic yards placed thereafter.

02405.7 CONCRETE STRENGTH TESTING

Concrete Strength - MnDOT Design 3F52 Take one set of cylinders per day minimum regardless of quantity. Cylinders sets shall be taken per every 100 cubic yards placed.

02405.8 CONCRETE MIX DESIGN TESTING

Concrete mix design shall be prepared by testing laboratory and submitted to the City Engineer or a designee for approval.

02405.9 BITUMINOUS AND CONCRETE CORES

Bituminous and concrete cores may be taken as determined by the City Engineer or a designee. The cores shall be taken at any locations within the roadway or trail as directed by the City Engineer or a designee. The contractor shall pay the cost of all core tests and any corrections required by the City.

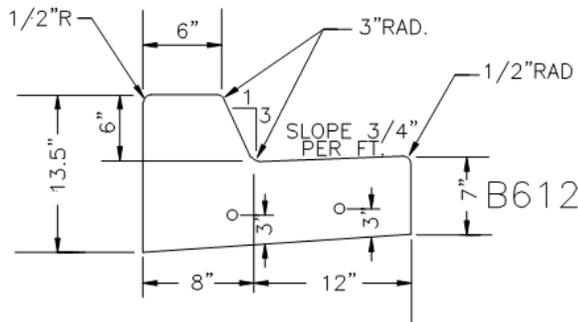
02406 MEASUREMENT AND PAYMENT

All items will be measured separately according to design designation as indicated in the Pay Item name and as may be detailed and defined in the Plans, Specifications, or Special Provisions. Complete-in-place items shall include all component materials/parts thereof as described or required to complete the unit, but excluding any excesses covered by separate Pay Items.

02407 STREET DETAIL PLATES

STRT -1 through STRT-30

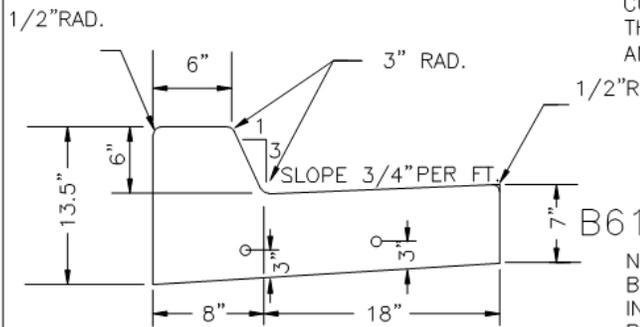
NOTE: B612 CURB MAY BE USED FOR PRIVATE DRIVES AND PARKING LOTS, BUT NOT PUBLIC STREETS



INSTALL AT ALL TRENCHES CROSSINGS OF THE CURB, 2 #4 EPOXY COATED REINFORCING RODS 20' IN LENGTH AND SHALL BE PLACED IN THE LOWER PORTION OF THE CURB

2 # 4 EXPOXY COATED REINFORCING RODS EXTENDING FROM BOTH SIDES OF CATCH BASINS NO LESS THEN 10' IN LENGTH

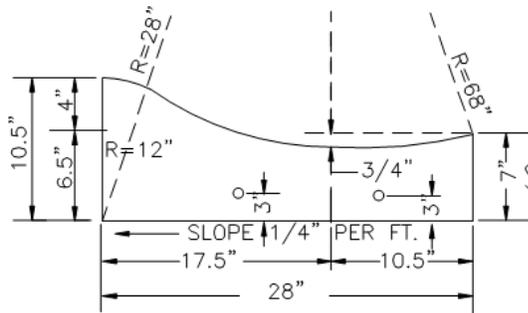
CONTROL JOINTS SHALL CONFORM WITH MNDOT SPEC. 2531.3C. (10' SPACING) CONTROL JOINTS SHALL EXTEND TO BOTH THE FRONT AND BACKS OF THE CURB AND BE 2" DEEP.



B618

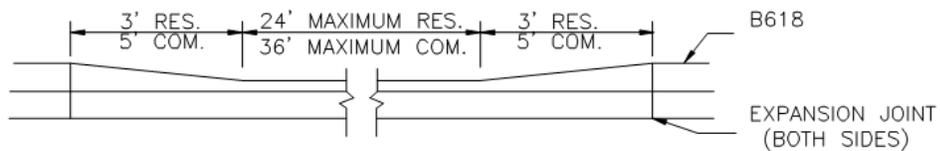
NOTE: B618 CURB TO BE INSTALLED AT ALL INTERSECTION RADIUS, ALONG OUTLOTS, PARKS, PLAY LOTS, MAJOR ARTERIES, AND SUSTAINED STRETCHES WITH NO DRIVEWAYS.

GENERALLY SURMOUNTABLE CURB TO BE INSTALLED WHERE RESIDENTIAL DRIVEWAYS ARE PLANNED.



SURMOUNTABLE

CURING COMPOUND SHALL BE APPLIED IMMEDIATELY AFTER FINISHING AND TO ALL EXPOSED SURFACES INCLUDING THE FRONT AND BACK OF THE CURBS. COVERAGE SHALL BE UNIFORM AND SHALL MATCH THE APPEARANCE OF A WHITE SHEET OF PAPER.

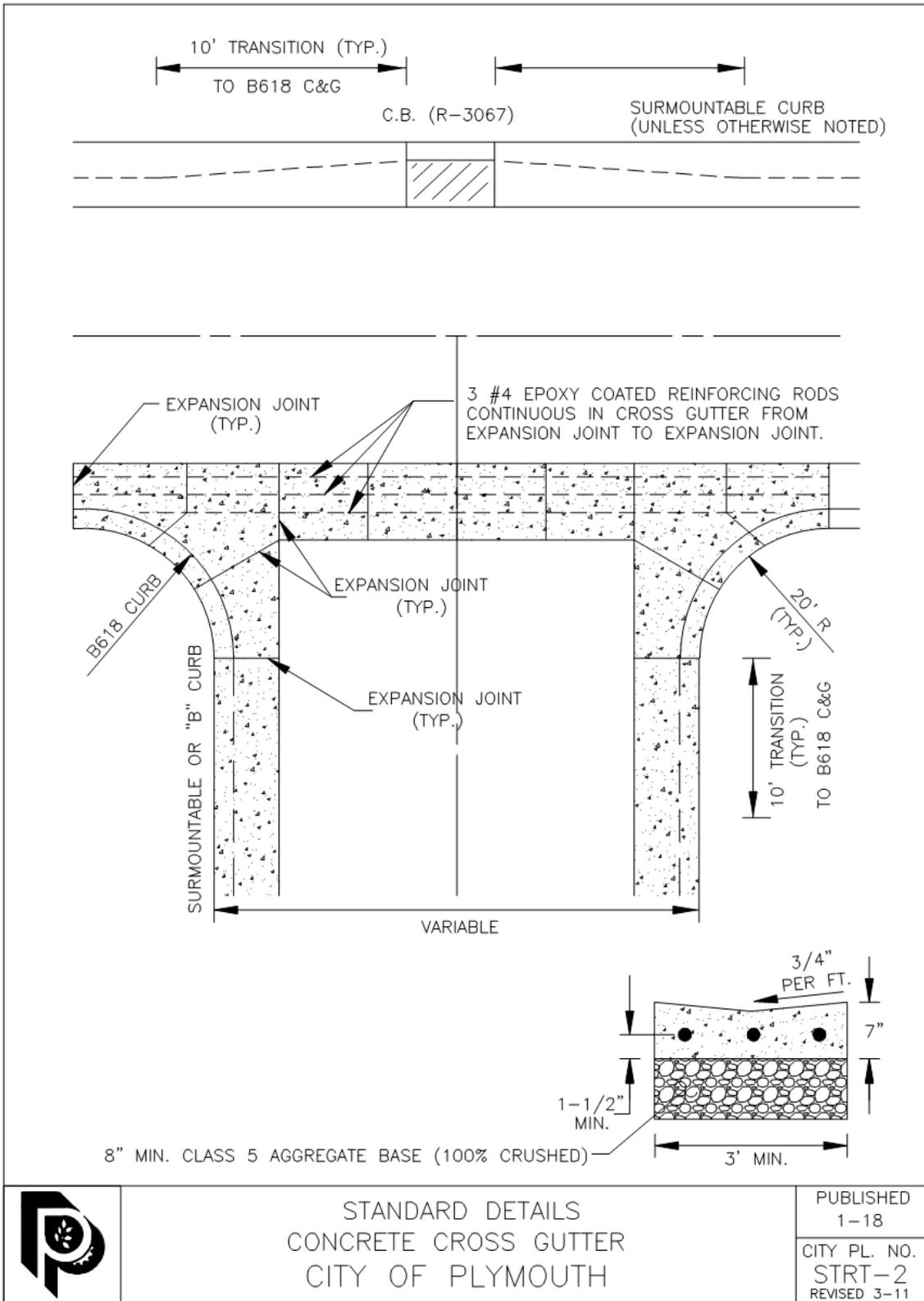


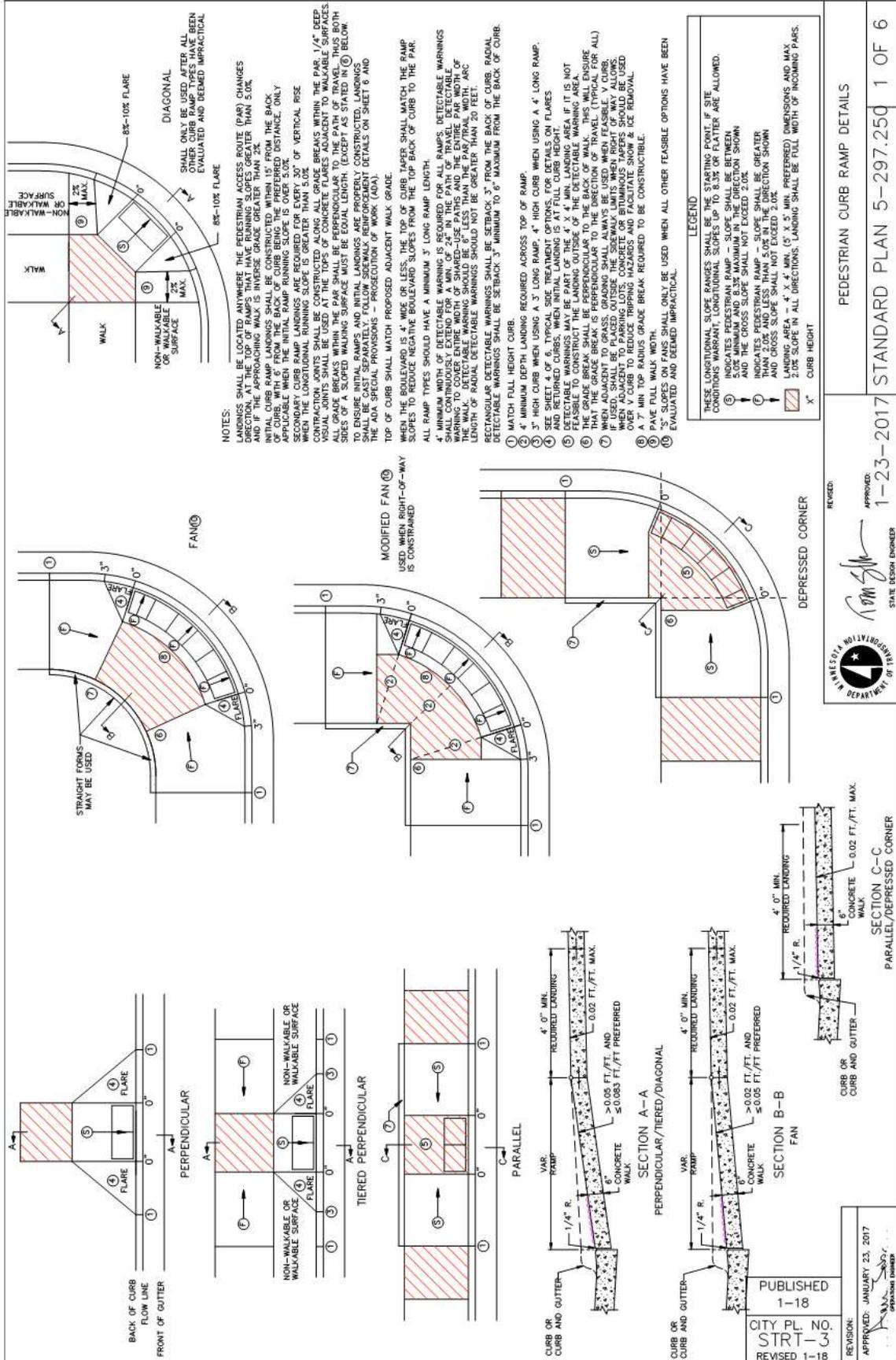
CURB CUT DETAIL

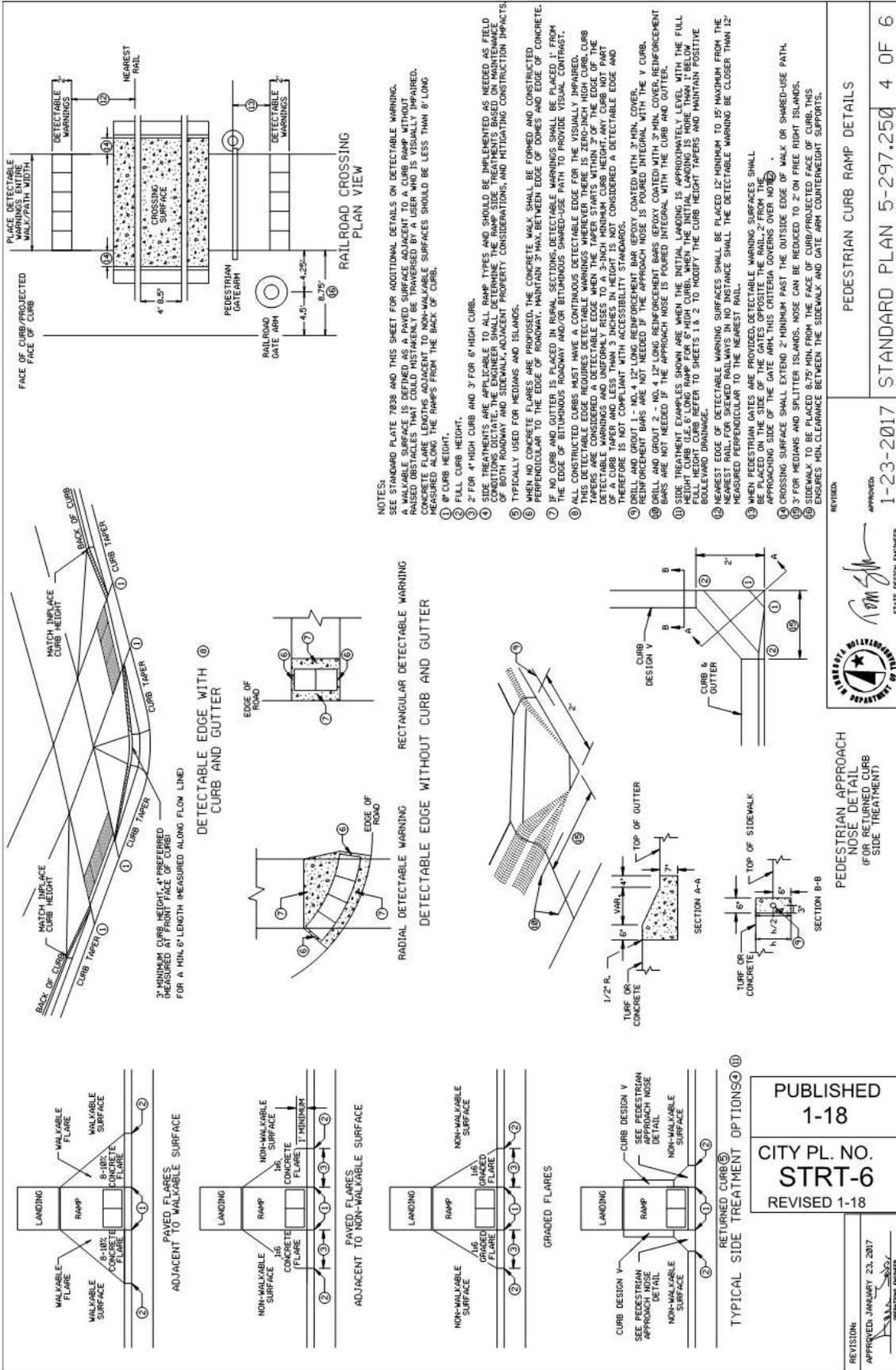


STANDARD DETAILS
STANDARD CURB DETAILS
CITY OF PLYMOUTH

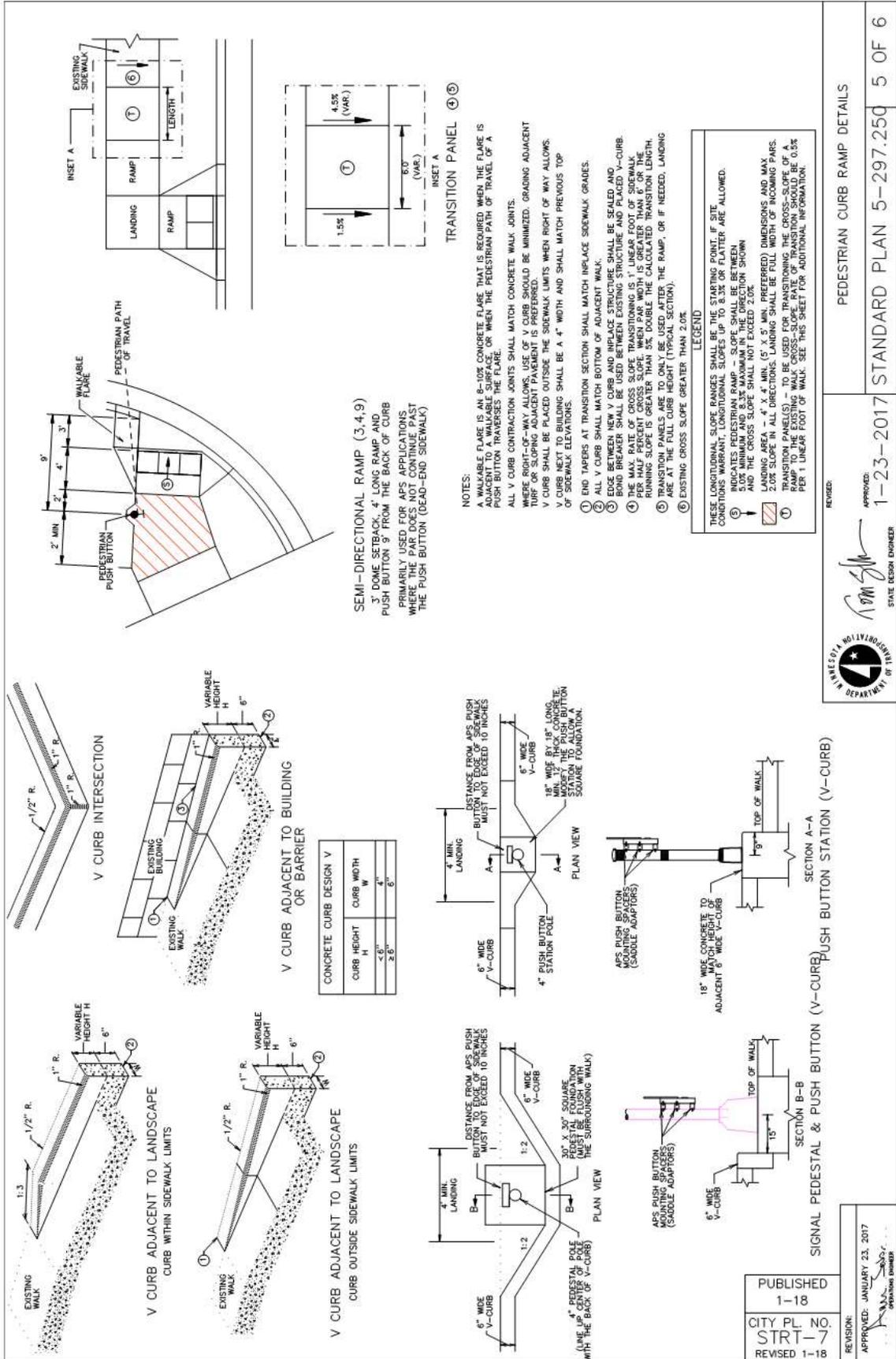
PUBLISHED
1-18
CITY PL. NO.
STRT-1
REVISED 3-14

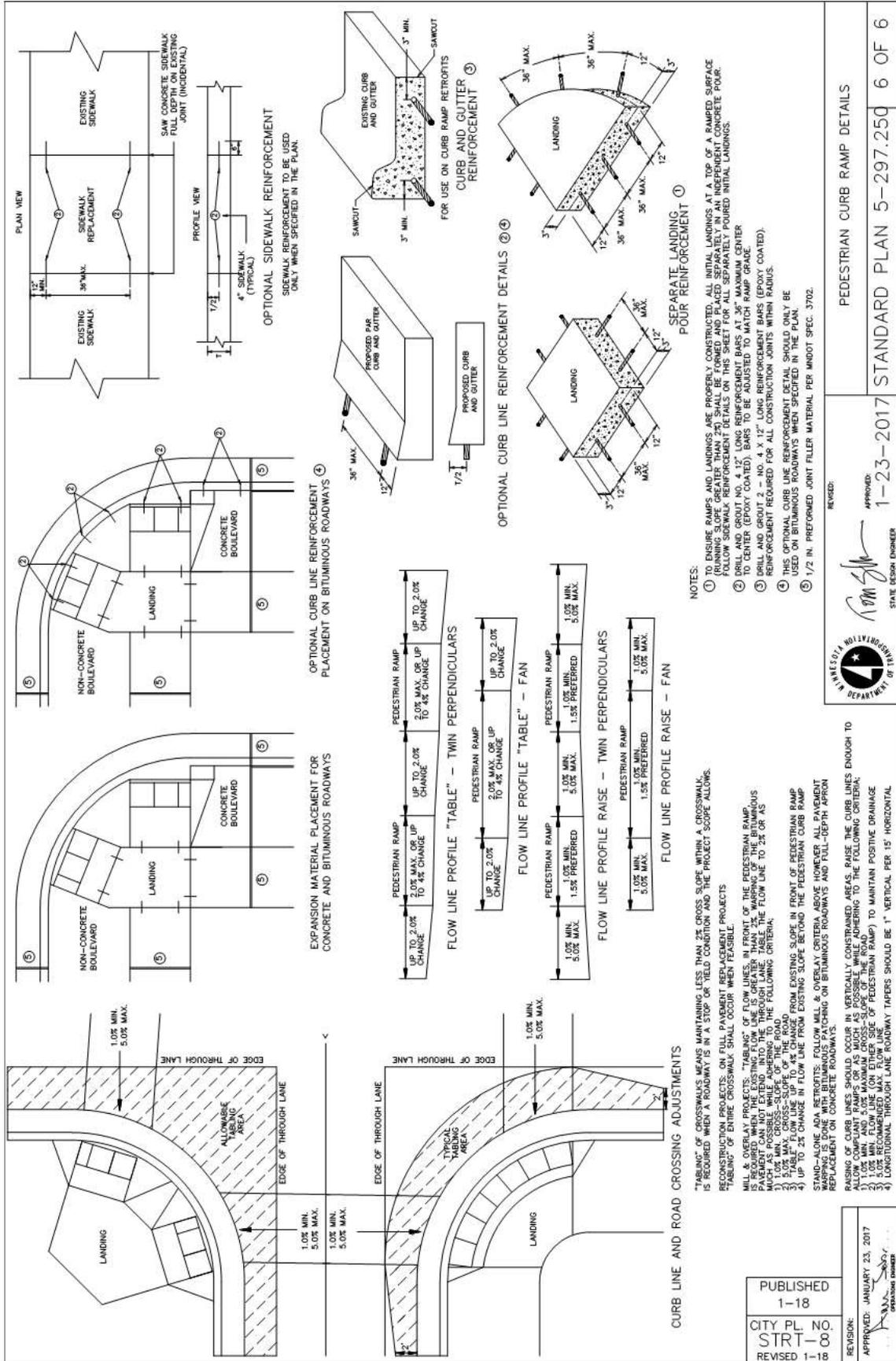






REVISION	1-23-2017	STANDARD PLAN 5-297.250	4 OF 6
APPROVED	 STATE DESIGN ENGINEER		
REVISION	PEDESTRIAN CURB RAMP DETAILS		
REVISION	PEDESTRIAN APPROACH NOSE DETAIL (FOR RETURNED CURB SIDE TREATMENT)		
REVISION	TYPICAL SIDE TREATMENT OPTIONS		
REVISION	PUBLISHED 1-18 CITY PL. NO. STRT-6 REVISED 1-18		
REVISION	APPROVED JANUARY 23, 2017  STATE DESIGN ENGINEER		



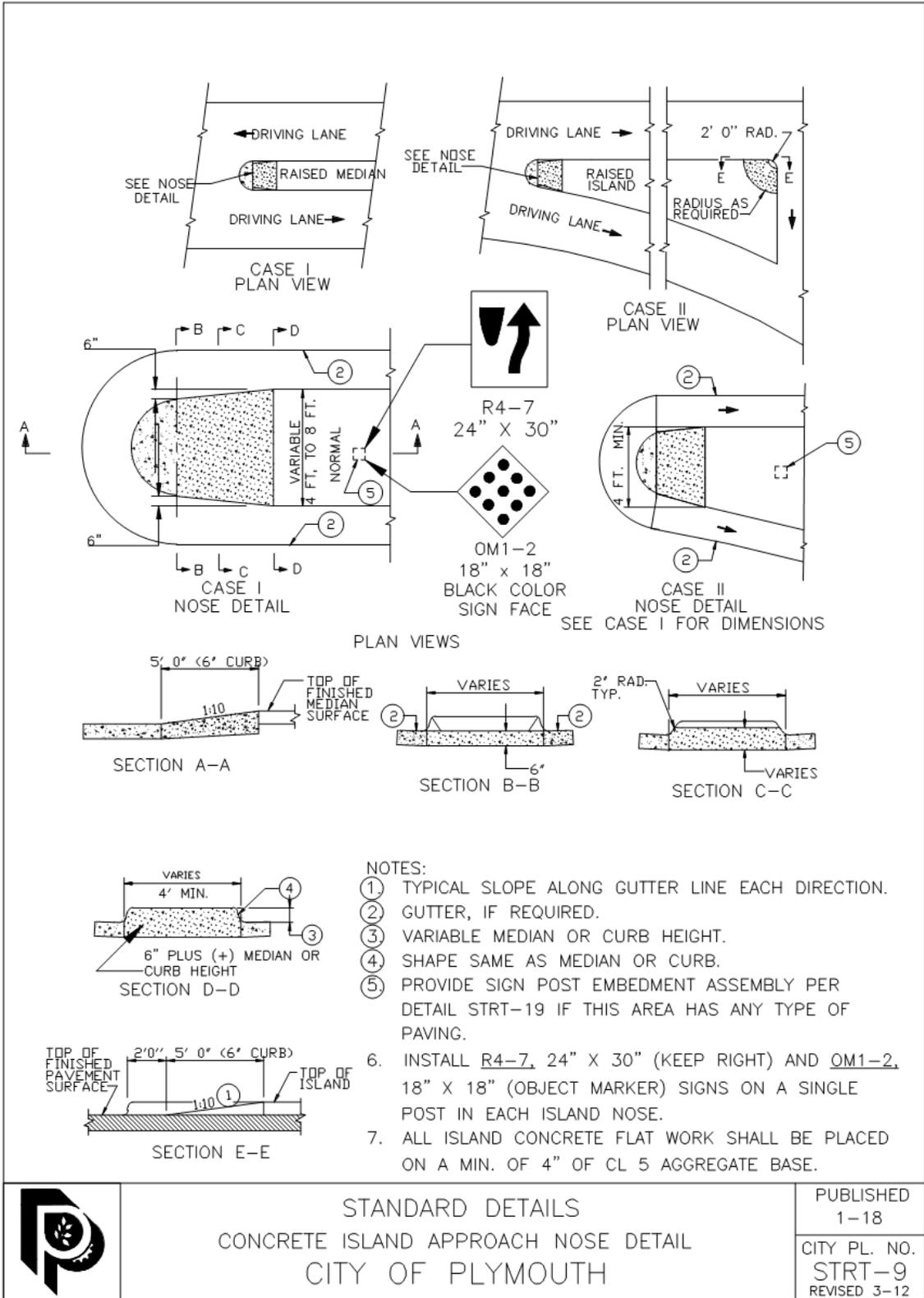


APPROVED: *[Signature]*
STATE DESIGN ENGINEER

REVISIONS:

REVISION	DATE	DESCRIPTION
1	JANUARY 23, 2017	PUBLISHED
2		CITY PL. NO. STR 1-08
3		REVISED 1-18

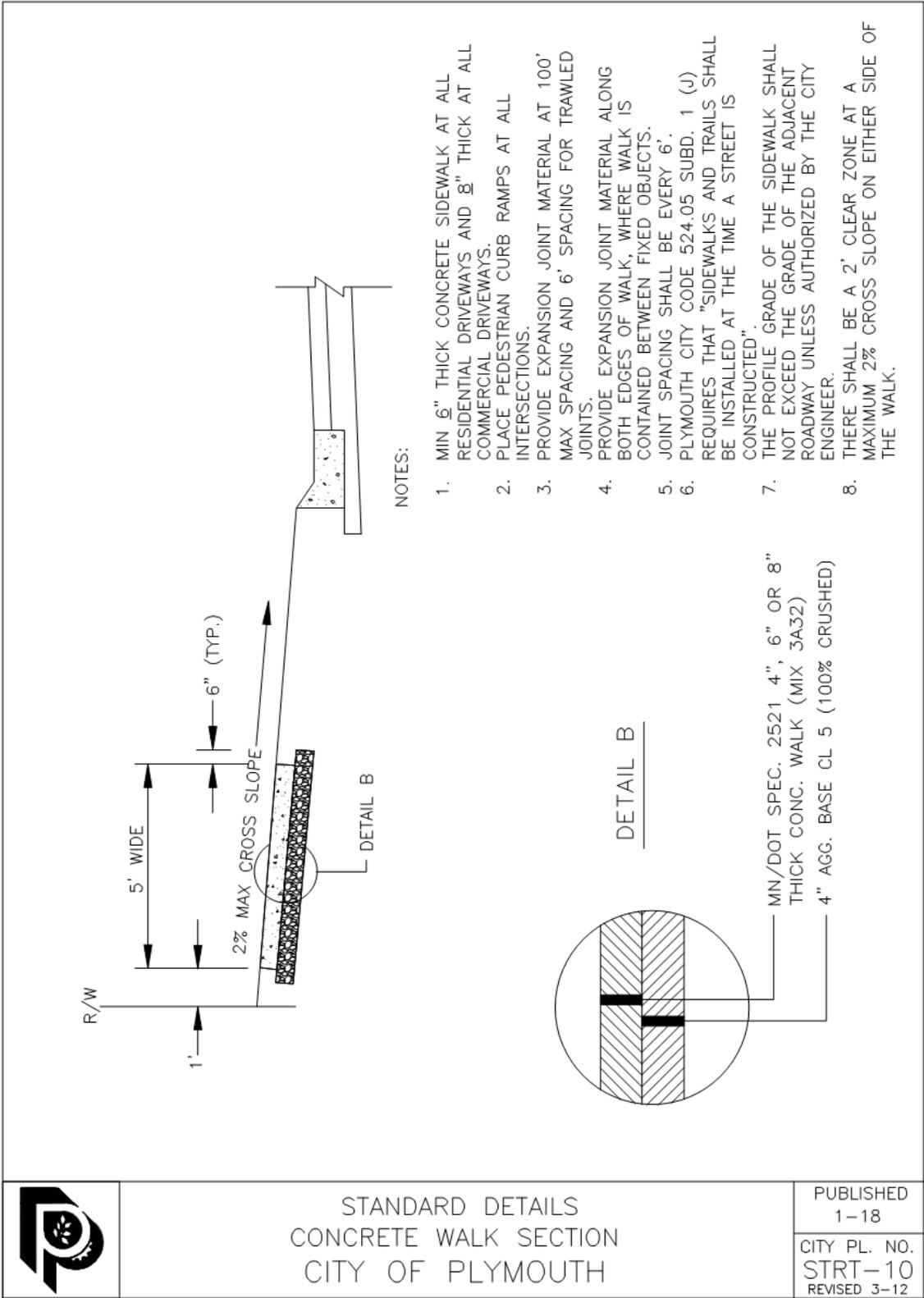
STANDARD PLAN 5-297.250 6 OF 6



STANDARD DETAILS
 CONCRETE ISLAND APPROACH NOSE DETAIL
 CITY OF PLYMOUTH

PUBLISHED
 1-18

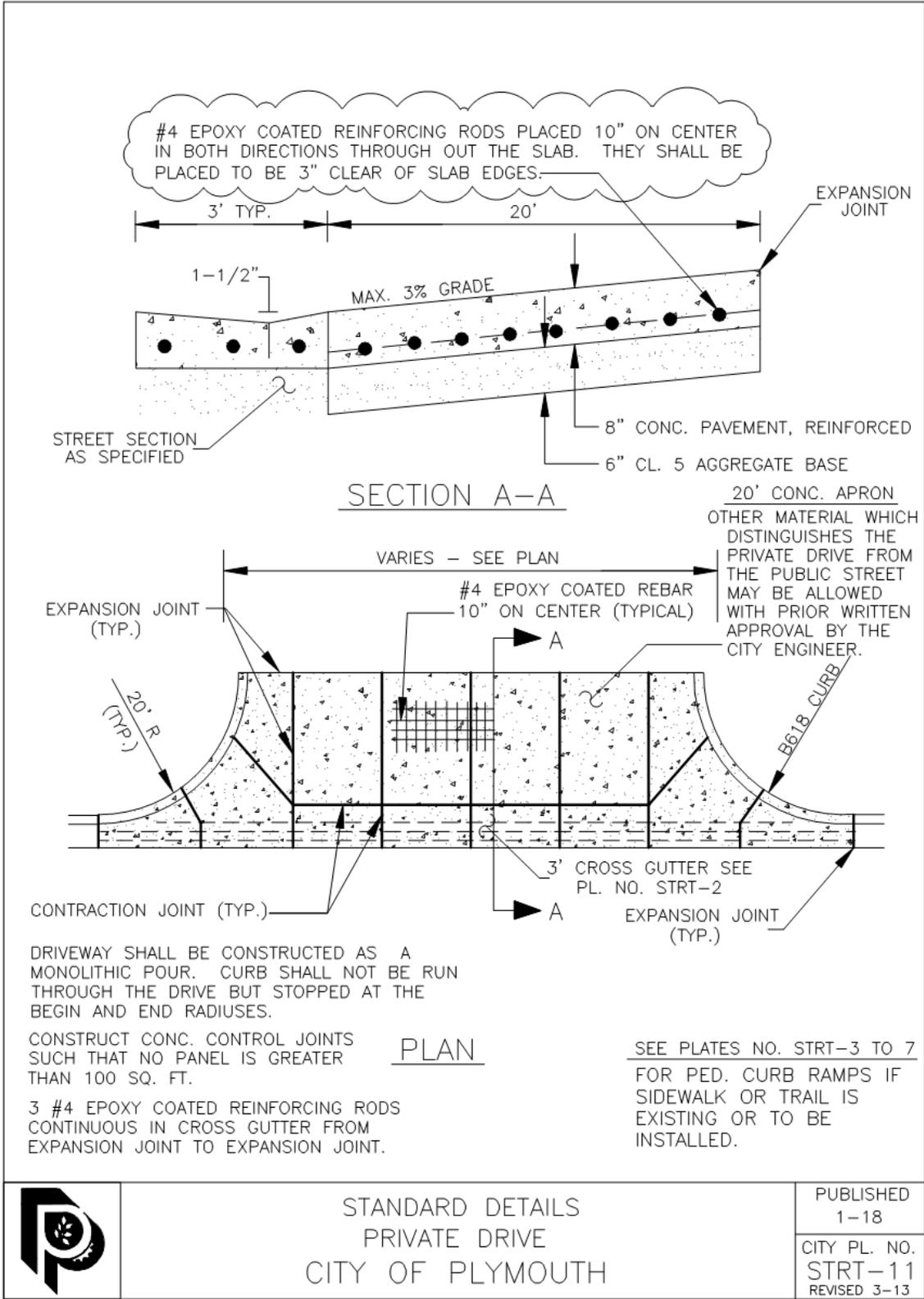
CITY PL. NO.
 STRT-9
 REVISED 3-12



STANDARD DETAILS
CONCRETE WALK SECTION
CITY OF PLYMOUTH

PUBLISHED
1-18

CITY PL. NO.
STRT-10
REVISED 3-12



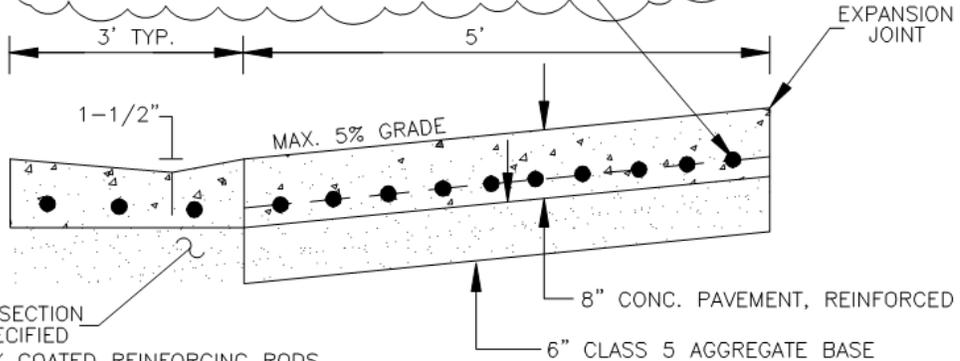
STANDARD DETAILS
PRIVATE DRIVE
CITY OF PLYMOUTH

PUBLISHED
1-18

CITY PL. NO.
STRT-11
REVISED 3-13

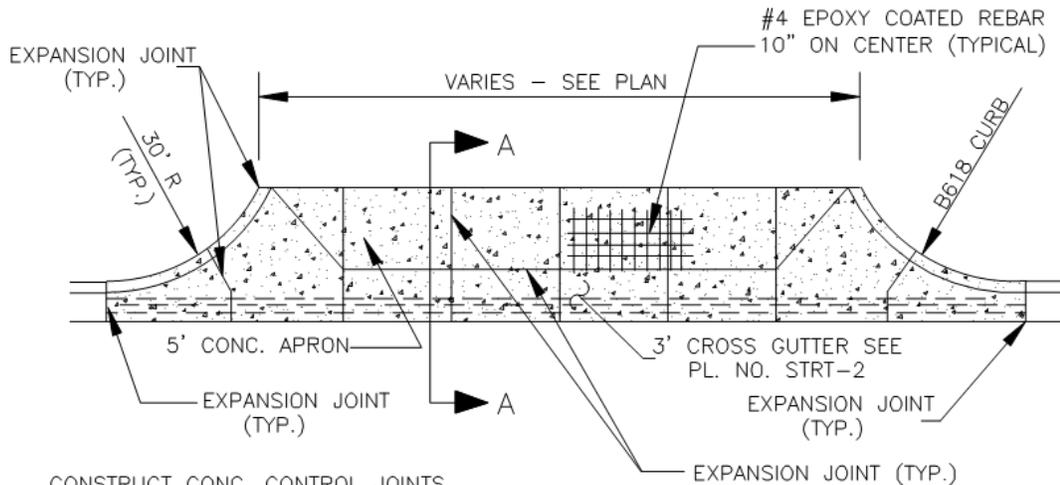
MINIMUM DRIVEWAY WIDTH - 24 FEET
 MAXIMUM DRIVEWAY WIDTH - 36 FEET

#4 EPOXY COATED REINFORCING RODS PLACED 10" ON CENTER IN BOTH DIRECTIONS THROUGH OUT THE SLAB. THEY SHALL BE PLACED TO BE 3" CLEAR OF SLAB EDGES.



STREET SECTION AS SPECIFIED
 3 #4 EPOXY COATED REINFORCING RODS CONTINUOUS IN CROSS GUTTER FROM EXPANSION JOINT TO EXPANSION JOINT.

SECTION A-A



CONSTRUCT CONC. CONTROL JOINTS SUCH THAT NO PANEL IS GREATER THAN 100 SQ. FT.

PLAN

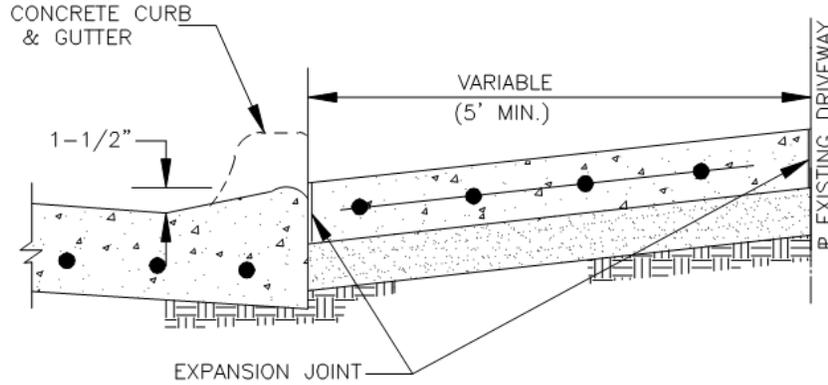
SEE PLATES NO. STRT-3 TO 7 FOR PED. CURB RAMPS IF SIDEWALK OR TRAIL IS EXISTING OR TO BE INSTALLED.



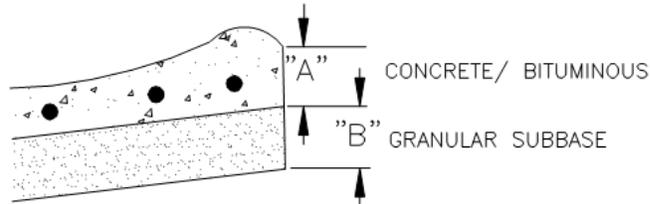
STANDARD DETAILS
 INDUSTRIAL / COMMERCIAL DRIVEWAY
 CITY OF PLYMOUTH

PUBLISHED 1-18
 CITY PL. NO. STRT-12
 REVISED 3-13

CONCRETE SLAB 6" MIN. THICKNESS, REINFORCED WITH #4 EPOXY COATED REINFORCING RODS PLACED 10" ON CENTER IN BOTH DIRECTIONS THROUGH OUT THE SLAB. THEY SHALL BE PLACED TO BE 3" CLEAR OF SLAB EDGES. SLAB SHALL BE PLACED ON 6" OF COMPACTED CL 5 AGGREGATE BASE.

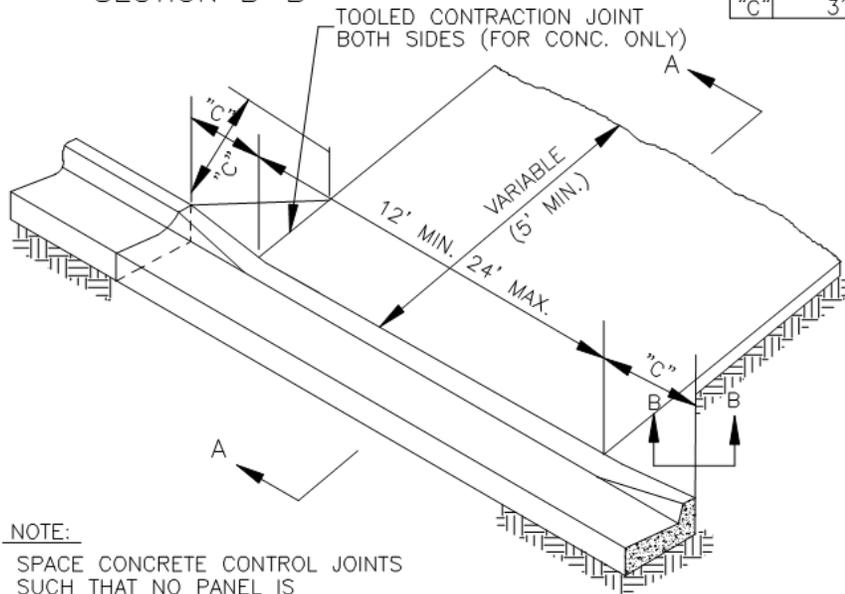


SECTION A-A



SECTION B-B

	CONCRETE	BITUMINOUS
"A"	6"	3"
"B"	6"	6"
"C"	3'	3'



NOTE:
SPACE CONCRETE CONTROL JOINTS SUCH THAT NO PANEL IS GREATER THAN 100 SQUARE FEET.

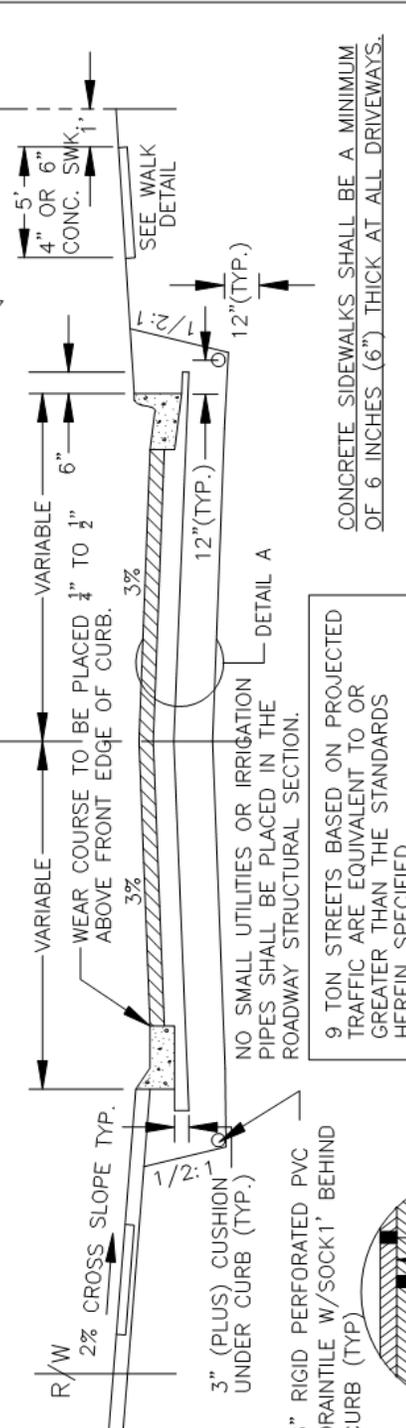


STANDARD DETAILS
RESIDENTIAL DRIVEWAY DETAIL
CITY OF PLYMOUTH

PUBLISHED
1-18

CITY PL. NO.
STRT-13
REVISED 3-13

- STREET SECTIONS SHALL BE DESIGNED BY A QUALIFIED ENGINEER BASED ON ACTUAL SITE SOIL CONDITIONS. THE STREET SECTION SHOWN IS THE MINIMUM SECTION ALLOWED.
- GRADES ON MINOR STREETS SHOULD PROVIDE AN AREA OF NOT MORE THAN A 3% GRADE AT INTERSECTIONS WITH STREETS OF A HIGHER TRAFFIC PRIORITY.
- RURAL SECTION GRAVEL SHOULDERS SHALL BE CONSTRUCTED WITH MNDOT CLASS 2, 100% CRUSHED (3138, TABLE 3138-1)
- RESIDENTIAL C.D.S.— 82' MIN. RADIUS TO BACK OF CURB
- COMMERCIAL C.D.S.— 102' MIN. RADIUS TO BACK OF CURB



MINIMUM SECTION
DETAIL A

MATERIAL	SPECIFICATIONS	G.E. FACTORS
BITUMINOUS WEAR COURSE	2360	2.25
BITUMINOUS BINDER & BASE	2360	2.25
AGGREGATE BASE	CL.5 (3138)	1.00
AGGREGATE SUBBASE	CL.3, CL.4 (3138)	0.75
SELECT GRANULAR MATERIAL	3149	0.50

GRANULAR EQUIVALENT (MN/DOT SPECIFIED)

DESIGN CRITERIA

PRESENT ADT=1000 VPD (MIN.)
 ANNUAL GROWTH FACTOR=3.0%
 20 YEAR DESIGN PERIOD
 DESIGN SPEED IS 30 MPH, UNLESS OTHERWISE NOTED BY CITY
 MIN. $\sum N18_{20} = 150,000$

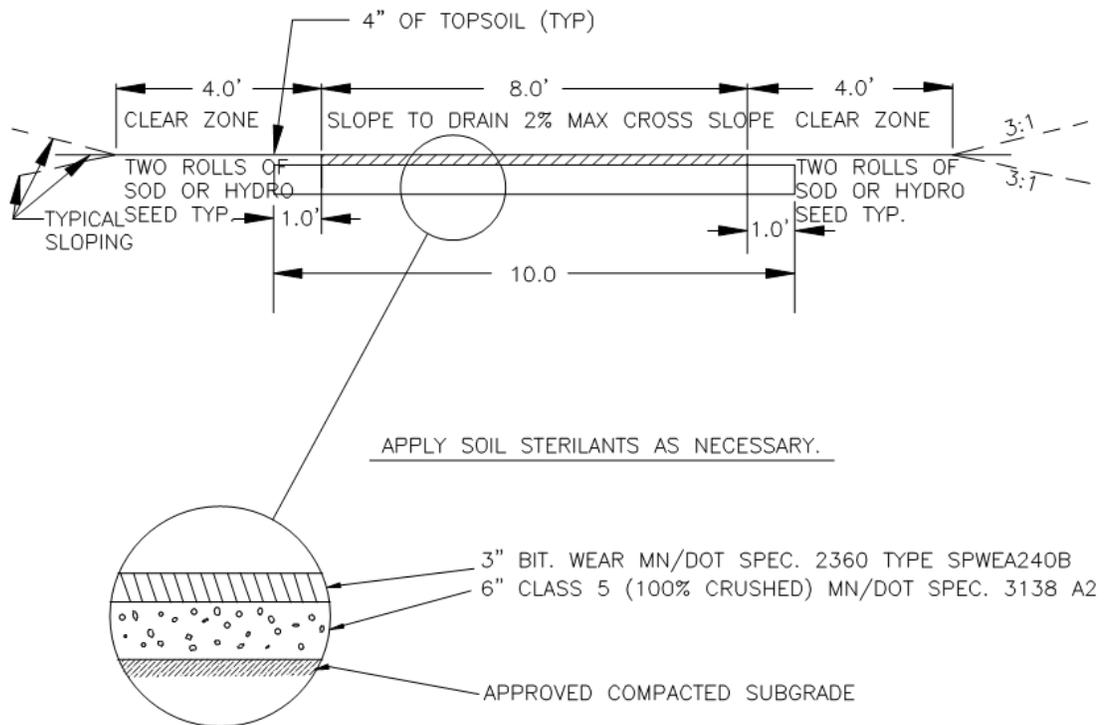


STANDARD DETAILS
 RESIDENTIAL STREET SECTION
 CITY OF PLYMOUTH

PUBLISHED
1-18

CITY PL. NO.
STRT-14
REVISED 3-15

PUBLIC OR PRIVATE TRAILS



APPLY SOIL STERILANTS AS NECESSARY.

NOTES:

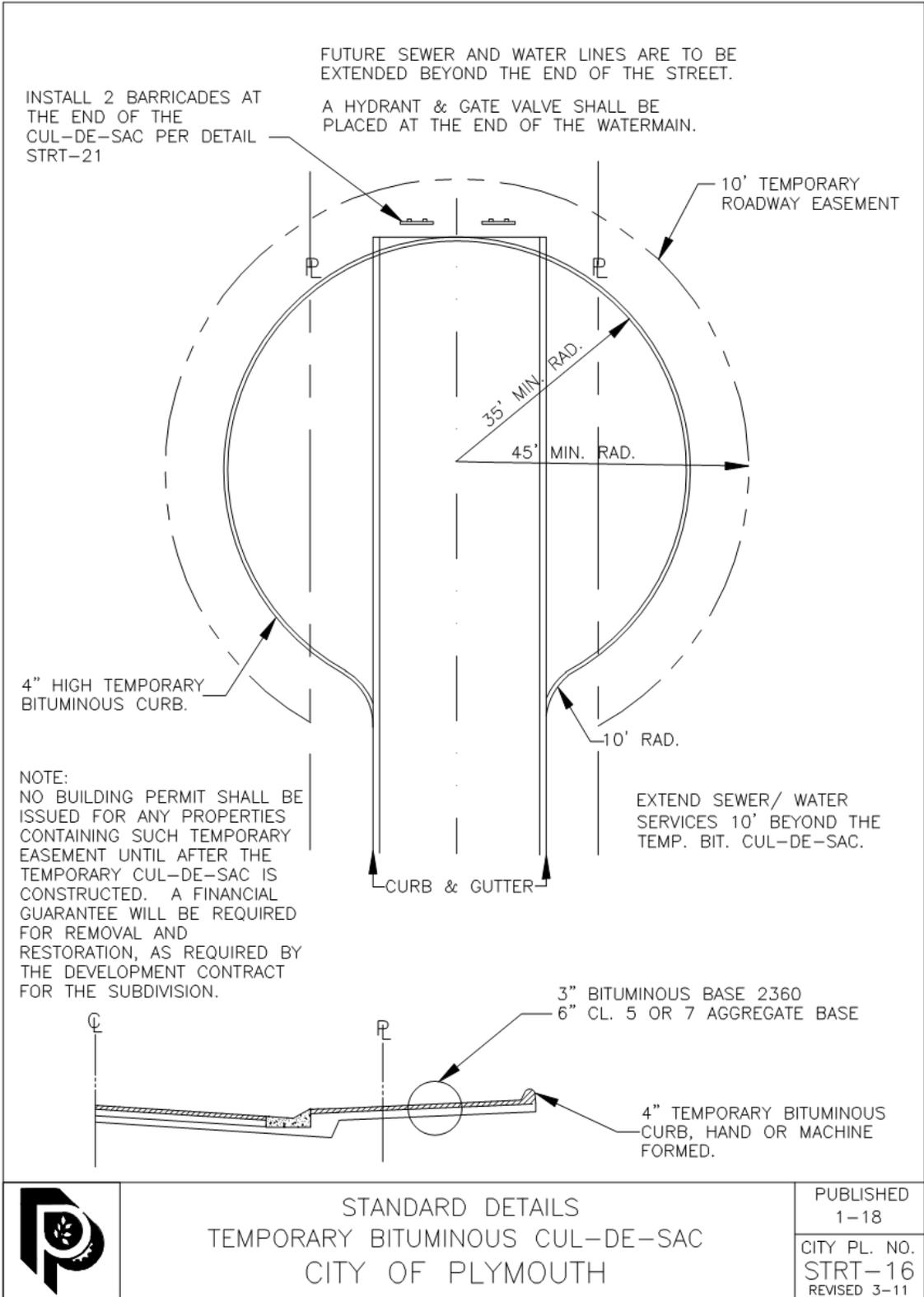
1. PLACE CONCRETE PEDESTRIAN CURB RAMPS AT ALL INTERSECTIONS SEE DETAILS STRT-3 THROUGH STRT-7.
2. PLYMOUTH CITY CODE 524.05 SUBD. 1 (J) REQUIRES THAT "SIDEWALKS AND TRAILS SHALL BE INSTALLED AT THE TIME A STREET IS CONSTRUCTED".
3. THE PROFILE GRADE OF THE SIDEWALK SHALL NOT EXCEED THE GRADE OF THE ADJACENT ROADWAY UNLESS AUTHORIZED BY THE CITY ENGINEER.

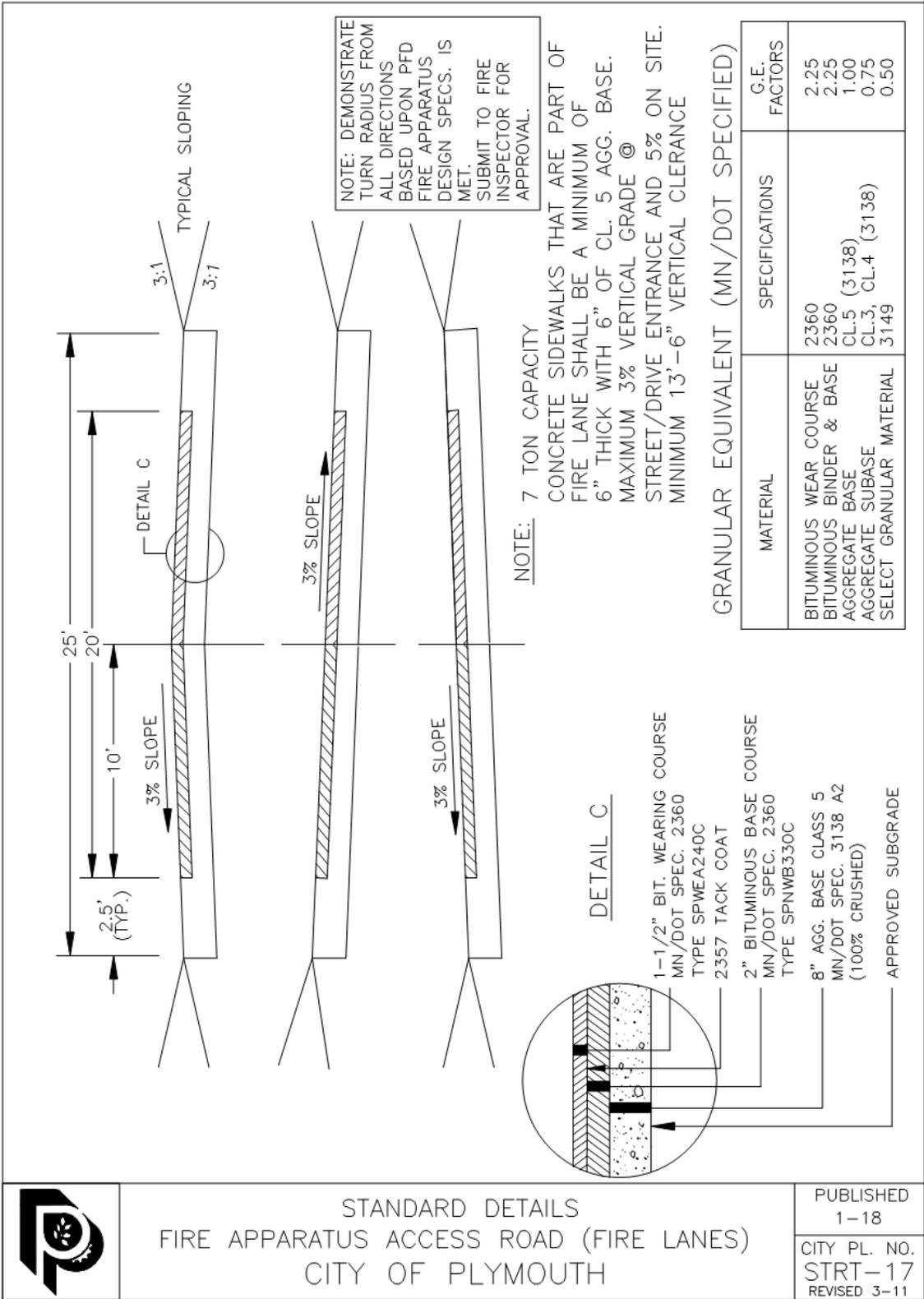


STANDARD DETAILS
 TYPICAL TRAIL CROSS SECTION
 CITY OF PLYMOUTH

PUBLISHED
 1-18

CITY PL. NO.
 STRT-15
 REVISED 1-17

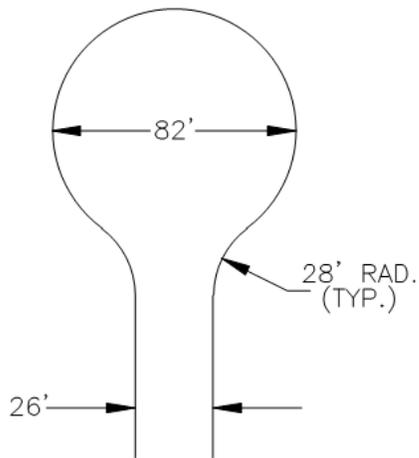




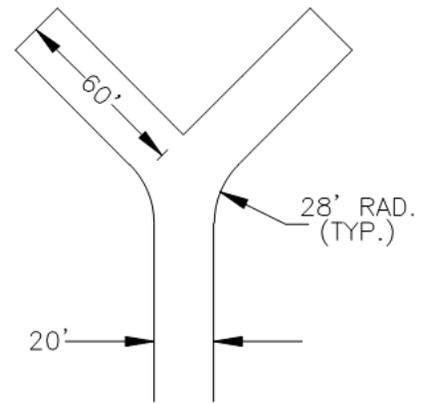
STANDARD DETAILS
FIRE APPARATUS ACCESS ROAD (FIRE LANES)
CITY OF PLYMOUTH

PUBLISHED
1-18

CITY PL. NO.
STRT-17
REVISED 3-11

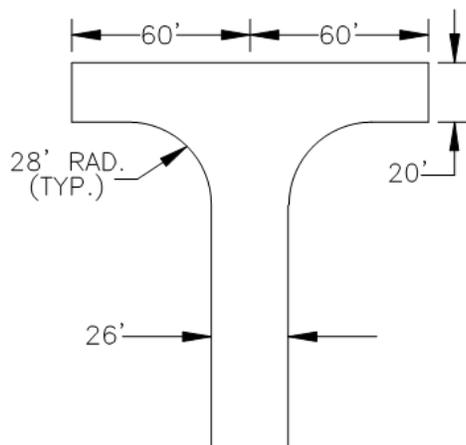


82' DIAMETER CUL-DE-SAC

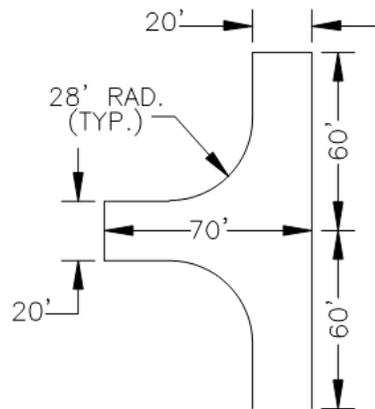


60' "Y"

SEE STD. DETAIL PLATE STRT-13 FOR
SECTION VIEW OF THESE FIRE LANE
LAYOUTS



120' HAMMERHEAD



ACCEPTABLE ALTERNATIVE
TO 120' HAMMERHEAD



STANDARD DETAILS
TURNAROUND REQUIREMENTS FOR DEAD-END FIRE
APPARATUS ACCESS ROADS (FIRE LANES)
CITY OF PLYMOUTH

PUBLISHED
1-18

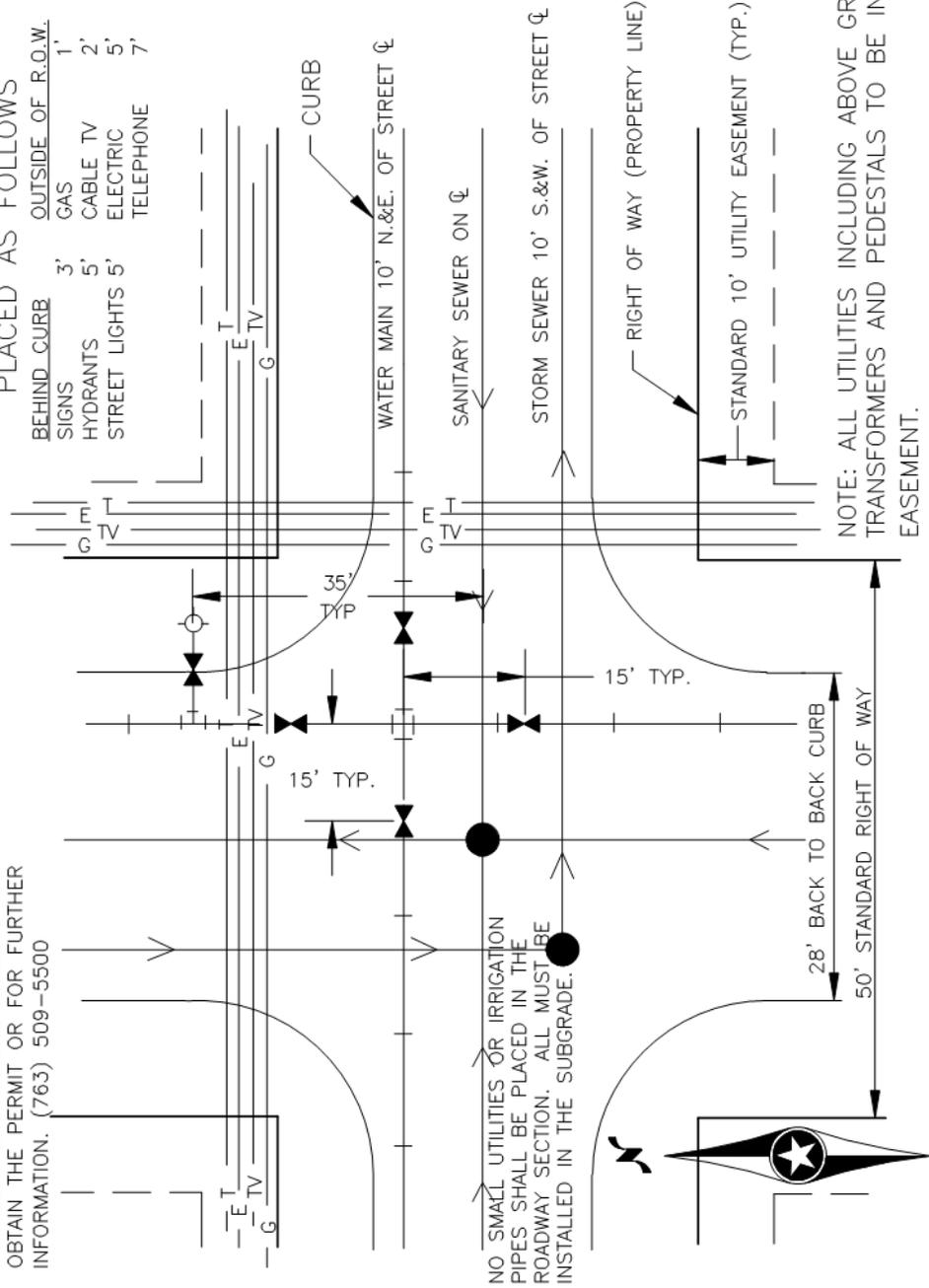
CITY PL. NO.
STRT-18
REVISED 3-11

NOTE: A PERMIT IS REQUIRED TO WORK IN THE PUBLIC RIGHT-OF-WAY. THIS INCLUDES INSTALLATION OF SMALL UTILITIES. CONTACT THE CITY OF PLYMOUTH ENGINEERING DIVISION TO OBTAIN THE PERMIT OR FOR FURTHER INFORMATION. (763) 509-5500

NOTE: SEE CITY PLATE NO. STRT-19 FOR ALTERNATE UTILITY PLACEMENT.

UTILITIES SHALL BE PLACED AS FOLLOWS

BEHIND CURB	OUTSIDE OF R.O.W.
SIGNS	3'
HYDRANTS	5'
STREET LIGHTS	5'
GAS	1'
CABLE TV	2'
ELECTRIC	5'
TELEPHONE	7'



NO SMALL UTILITIES OR IRRIGATION PIPES SHALL BE PLACED IN THE ROADWAY SECTION. ALL MUST BE INSTALLED IN THE SUBGRADE.

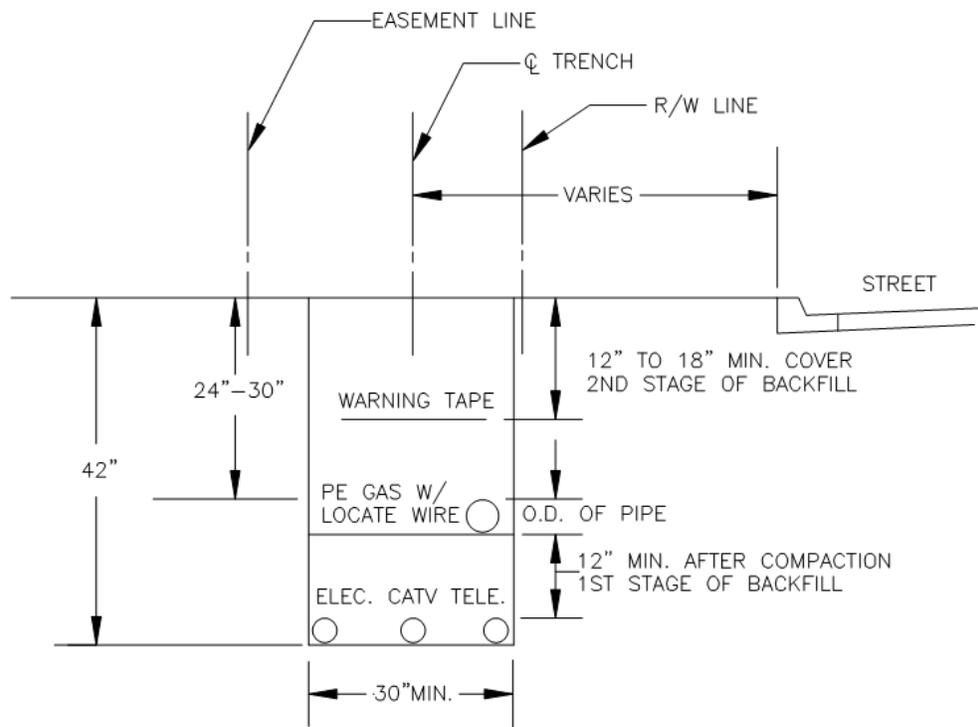
NOTE: ALL UTILITIES INCLUDING ABOVE GROUND TRANSFORMERS AND PEDESTALS TO BE IN EASEMENT.



STANDARD DETAILS
LOCATION OF PUBLIC UTILITIES
CITY OF PLYMOUTH

PUBLISHED
1-18
CITY PL. NO.
STRT-19
REVISED 3-16

NOTE: A PERMIT IS REQUIRED TO WORK IN THE PUBLIC RIGHT-OF-WAY. THIS INCLUDES INSTALLATION OF SMALL UTILITIES. CONTACT THE CITY OF PLYMOUTH ENGINEERING DIVISION TO OBTAIN THE PERMIT OR FOR FURTHER INFORMATION. (763) 509-5500



NOTE:
 ALL SMALL UTILITIES INCLUDING ABOVE GROUND TRANSFORMERS AND PEDESTALS TO BE LOCATED IN THE DRAINAGE AND UTILITY EASEMENTS PARALLEL TO THE RIGHT-OF-WAY. TRANSFORMERS AND PEDESTALS SHALL NOT BE PLACED OVER PUBLIC UTILITIES THAT ARE IN THE D&U EASEMENTS EITHER ALONG THE STREETS OR THROUGH THE LOTS.



STANDARD DETAILS
 SINGLE TRENCH INSTALLATION
 LOCATION OF PUBLIC UTILITIES
 CITY OF PLYMOUTH

PUBLISHED
 1-18

CITY PL. NO.
 STRT-20
 REVISED 3-12

THE INTENT OF THESE SPECIFICATIONS IS TO HAVE A UNIFORM TRAFFIC CONTROL SIGNS THROUGHOUT THE CITY. THIS IS IMPORTANT FOR ESTHETIC PURPOSES AND WILL EASE REPAIRS, KEEPING THE NUMBER AND TYPES OF PARTS NEEDED IN INVENTORY TO A MINIMUM.

THE SPECIFICATIONS INCLUDE, BUT ARE NOT LIMITED TO: REGULATORY, PARKING, SCHOOL, WARNING, PARK AND INFORMATION SIGNS.

ALL SIGNAGE SHALL BE SHOWN ON THE STREET PLANS OR A SEPARATE PLAN SHEET FOR THE PROJECT.

THE CITY PUBLIC WORKS DEPARTMENT SHALL APPROVE ALL SIGNS AND MATERIALS PRIOR TO INSTALLATION. (SUBMIT SHOP DRAWINGS FOR REVIEW AND APPROVAL)

SIGNS:

COMMON SIGN SIZES:

STOP – R1-1, 30" X 30"

"NO PARKING ANY TIME" (SYMBOL W/"ANY TIME" UNDERNEATH)– R7-2A, 12" X 18"

SPEED LIMIT – R2-1, 24" X 30"

STOP AHEAD – W3-1, 36" X 36"

SIGNAL AHEAD – W3-3, 36" X 36"

KEEP RIGHT – R4-7, 24" X 30"

OBJECT MARKER – OM1-2, 18" X 18" (BLACK BACKGROUND W/ YELLOW REFLECTORS)

NO OUTLET – W14-2, 30" X 30"

ALL SIGNS SHALL BE LYLE SIGNS OR APPROVED EQUAL.

ALL SIGNS WILL HAVE "3M" HIGH INTENSITY REFLECTIVE SHEETING OR APPROVED EQUAL.

ALL SIGNS SHALL BE ON ALUMINUM PLATE.

ALL SIGNS UP TO 18" SHALL BE .080 MIN. THICKNESS.

ALL SIGNS OVER 30" SHALL BE 0.100 MIN. THICKNESS.

ALL SIGNS TO BE SIZED ACCORDING TO MN MUTCD MANUAL.

AND PUNCHED WITH $\frac{3}{8}$ " HOLES MEETING MN/DOT SPECS.

POSTS:

THE SIGN SUPPORTS WILL BE EITHER A "U" CHANNEL POST, PAINTED GREEN OR A 3" DIAMETER, 12' LONG TUBE POST. THE POSTS SHALL BE 2 & 3 LBS. PER FT. AND 6,7 AND 8' IN LENGTH. ALL SIGNS UP TO 18" SHALL BE MOUNTED ON 2 U-CHANNEL POSTS, EACH 2 LBS., ONE 7' LONG AND ONE 6' LONG. THE LONGER POST TO BE DRIVEN IN THE GROUND FIRST.

ALL SIGNS 18" TO 30" SHALL USE A 8' – 3 LB. POST AND A 7' – 2 LB. POST, WITH THE 3LB. POST DRIVEN INTO THE GROUND FIRST.

ALL SIGNS OVER 30" SHALL USE 2 SETS OF POSTS. (THE HEAVIER POST PLACED IN THE GROUND FIRST)

ALL U-CHANNEL POSTS WILL BE POUNDED 3' INTO THE GROUND.

PLACEMENT AND MOUNTING HEIGHTS:

SEE PLATES STRT-20 THROUGH STRT-26

ALL TUBE POST SHALL BE PLACED IN A 10" DIAMETER BY 3' DEEP CONCRETE FOOTING FLARED AT THE BOTTOM.

IT WILL BE THE RESPONSIBILITY OF THE INSTALLER TO HAVE ALL UNDERGROUND UTILITIES LOCATED.

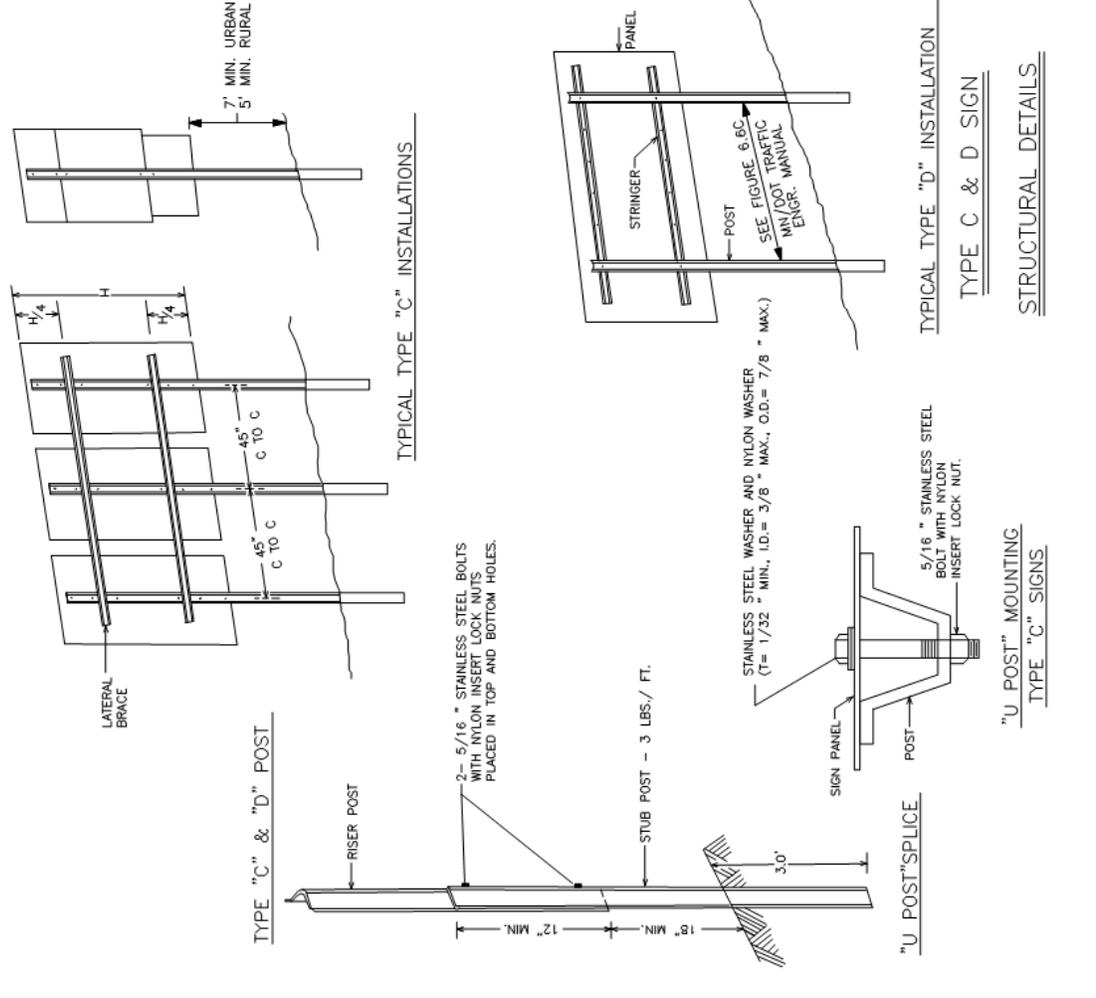


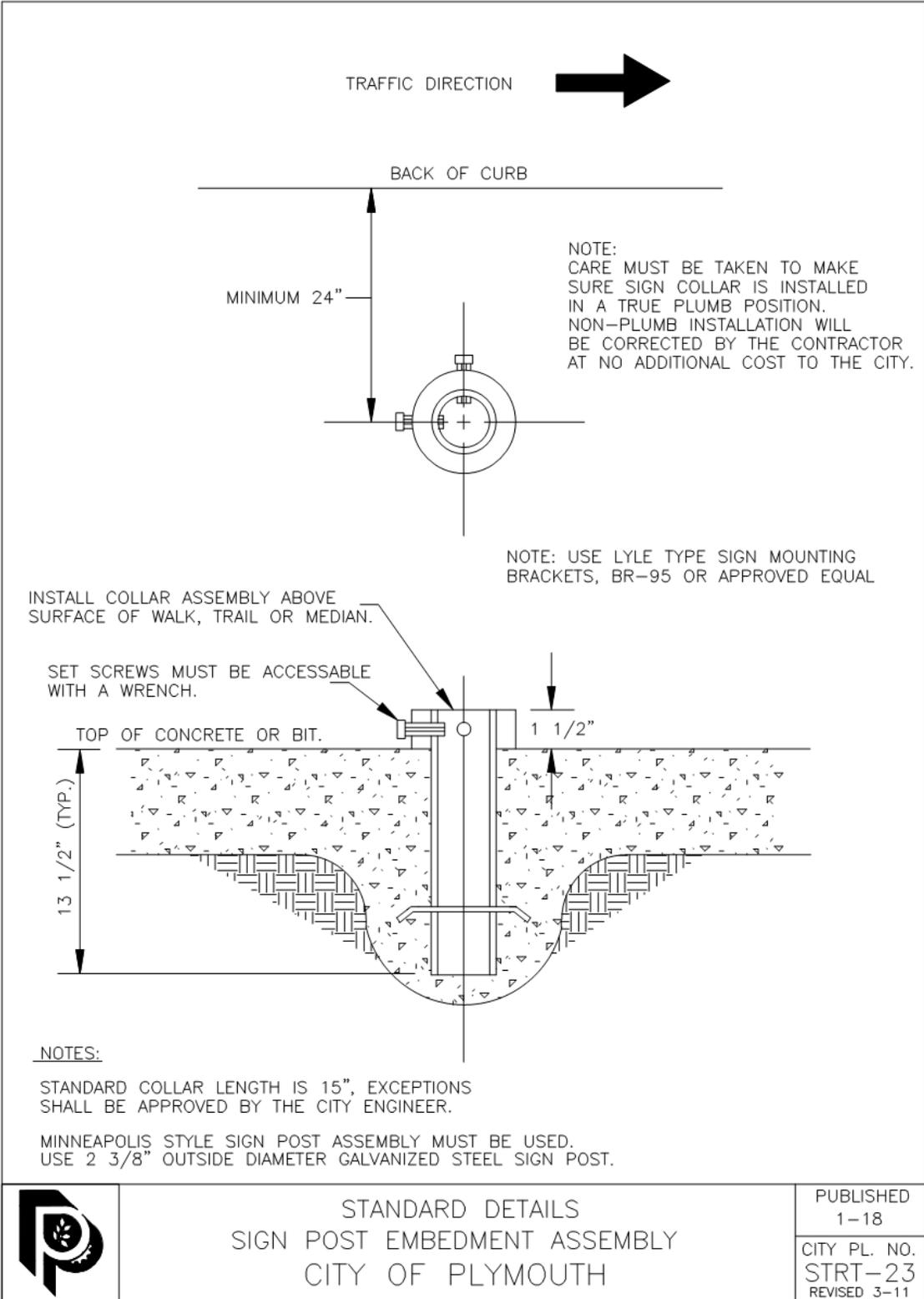
STANDARD DETAILS
TRAFFIC SIGN SPECIFICATIONS
CITY OF PLYMOUTH

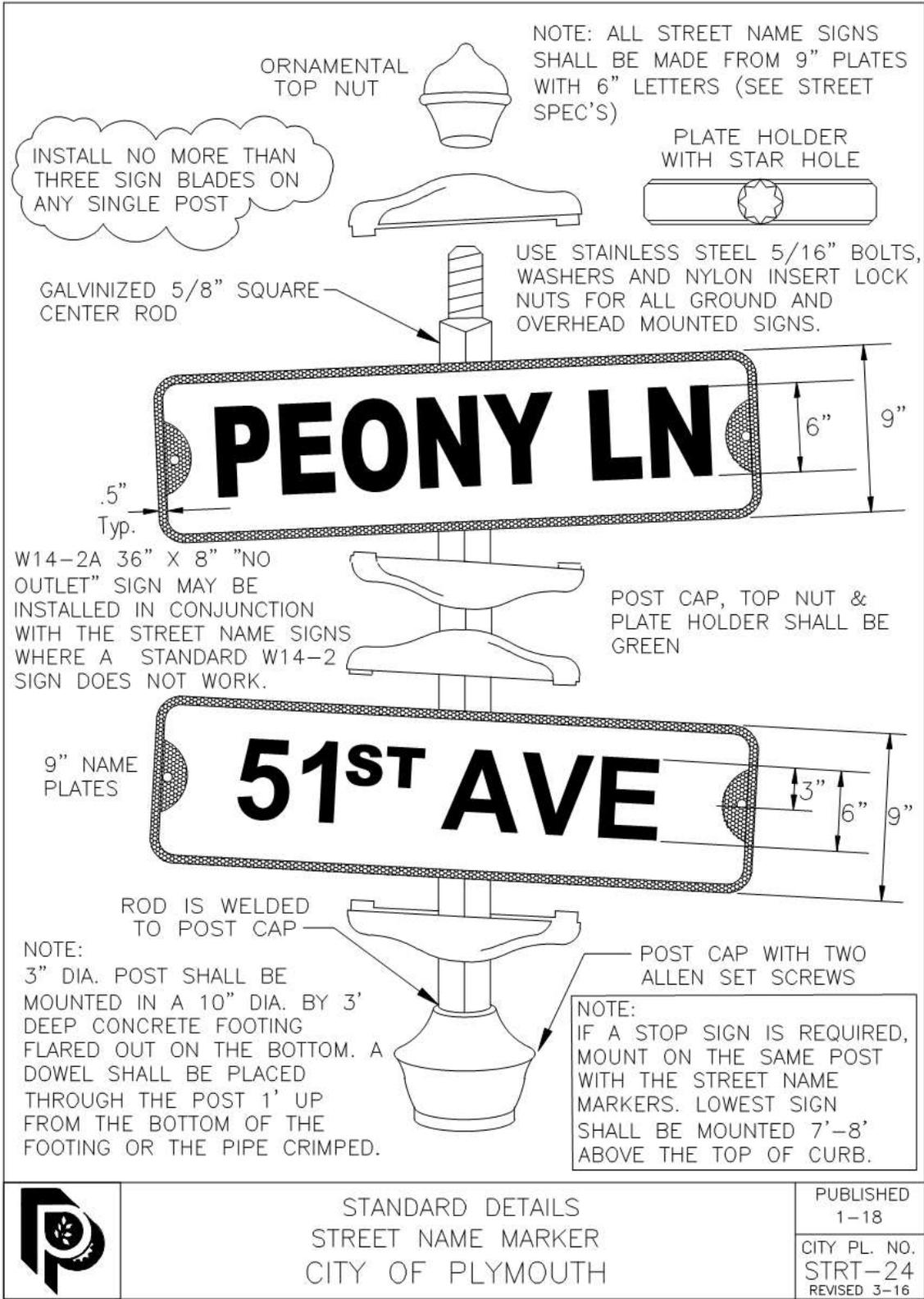
PUBLISHED
1-18

CITY PL. NO.
STRT-21
REVISED 3-16

- NOTES:
- USE 3# STUB POSTS, RISER POSTS, STRINGERS, KNEE BRACES, LATERAL BRACES AND KNEE BRACES STUB POSTS. ALL SHALL CONFORM TO MN/DOT 3401. POST SHALL NOT BE GALVANIZED. THE POSTS SHALL BE COATED WITH AN APPROVED RUST INHIBITIVE GREEN PAINT.
 - ALL SIGNS SHALL MEET THE REQUIREMENTS OF MN/DOT 3352 FOR STANDARD NO. 2 REFLECTIVE SHEETING "3M DIAMOND GRADE DG3" AND THE MINNESOTA MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES.
 - SIGNS PANEL SHALL BE FABRICATED FROM ALUMINUM CONFORMING TO MATERIAL OF MN/DOT 3352.2A1A AND 3352.2A1B.
 - TYPE "D" SIGN PANELS SHALL BE BOLTED TO STRINGERS AT 24" MAXIMUM INTERVALS IN ACCORDANCE WITH TYPE "D" STRINGER AND PANEL-JOINT DETAIL (SEE STANDARD SIGNS MANUAL).
 - MOUNTING (PUNCHING CODE) FOR TYPE "C" SIGN PANELS SHALL BE AS INDICATED IN THE STANDARD SIGNS MANUAL UNLESS OTHERWISE SPECIFIED.
 - ALL RISERS (VERTICAL) "U" POSTS SHALL BE SPLICED. DRIVEN STUB POSTS SHALL BE AT LEAST 7' LONG.
 - KNEE BRACE STUB POSTS SHALL NOT BE MORE THAN 4" ABOVE GROUND AND IMBEDDED AT LEAST 3'.
 - WHERE 3 OR MORE VERTICAL POSTS ARE REQUIRED PER SIGN ASSEMBLY, THERE SHALL BE AT LEAST 45" CENTER TO CENTER BETWEEN ADJACENT POSTS.
 - USE STAINLESS STEEL 3/8" BOLTS, WASHERS AND NYLON INSERT LOCK NUTS AS FOR ALL GROUND AND OVERHEAD MOUNTED SIGNS.
 - STAINLESS STEEL WASHER WITH SAME DIMENSION SHALL BE PROVIDED BETWEEN ALL NYLON WASHERS AND BOLT HEADS.
 - COLLARS SHALL BE USED TO SHIM OVERLAYS AND DE-MOUNTABLE LEGEND AWAY FROM PANEL WHERE INTERFERENCE WITH BOLT HEADS IS ENCOUNTERED. MN/DOT 3352.2A7.
 - MULTIPLE POST INSTALLATIONS SHALL BE REINFORCED WITH AT LEAST ONE LATERAL BRACE. INSTALLATIONS WHERE THE TOTAL PANEL HEIGHT IS 60" OR MORE SHALL HAVE TWO LATERAL BRACES LOCATED APPROXIMATELY AT THE QUARTER POINTS.
 - WHERE 2 OR MORE SINGLE POST SIGNS (TYPE "C") ARE MOUNTED SIDE BY SIDE, THEY SHALL BE REINFORCED LATERALLY BY AT LEAST 2 POST SECTIONS. BOLTED AT EACH POST AND LOCATED APPROXIMATELY AT THE QUARTER POINTS AS SHOWN IN SKETCH.
 - EDGE OF SIGN SHALL BE MINIMUM OF 2" FROM FACE OF CURB OR 6" FROM EDGE OF SHOULDER.
 - SEE STANDARD PLATE NO. STRT-21 FOR SIGN POST EMBEDMENT ASSEMBLY.



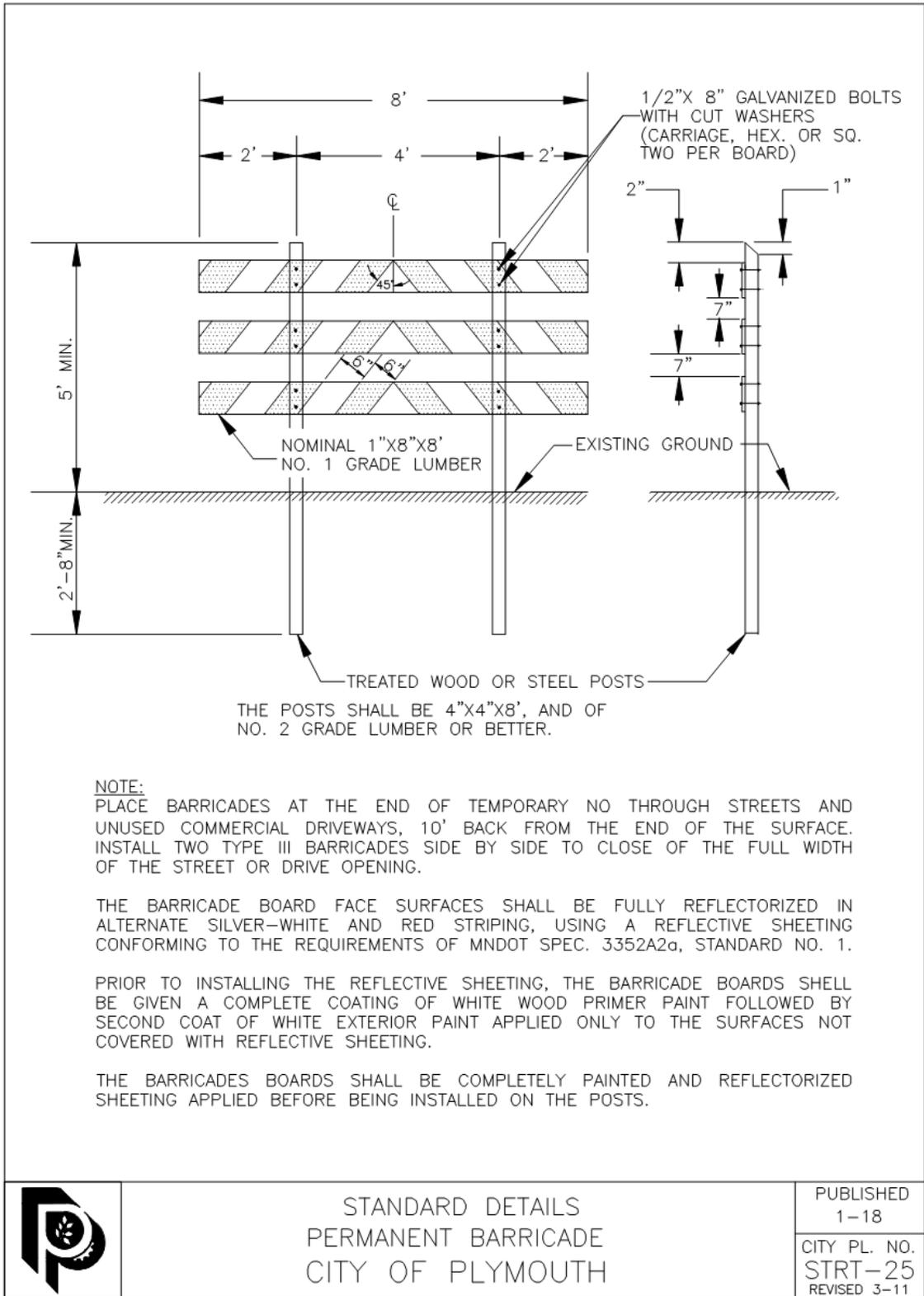


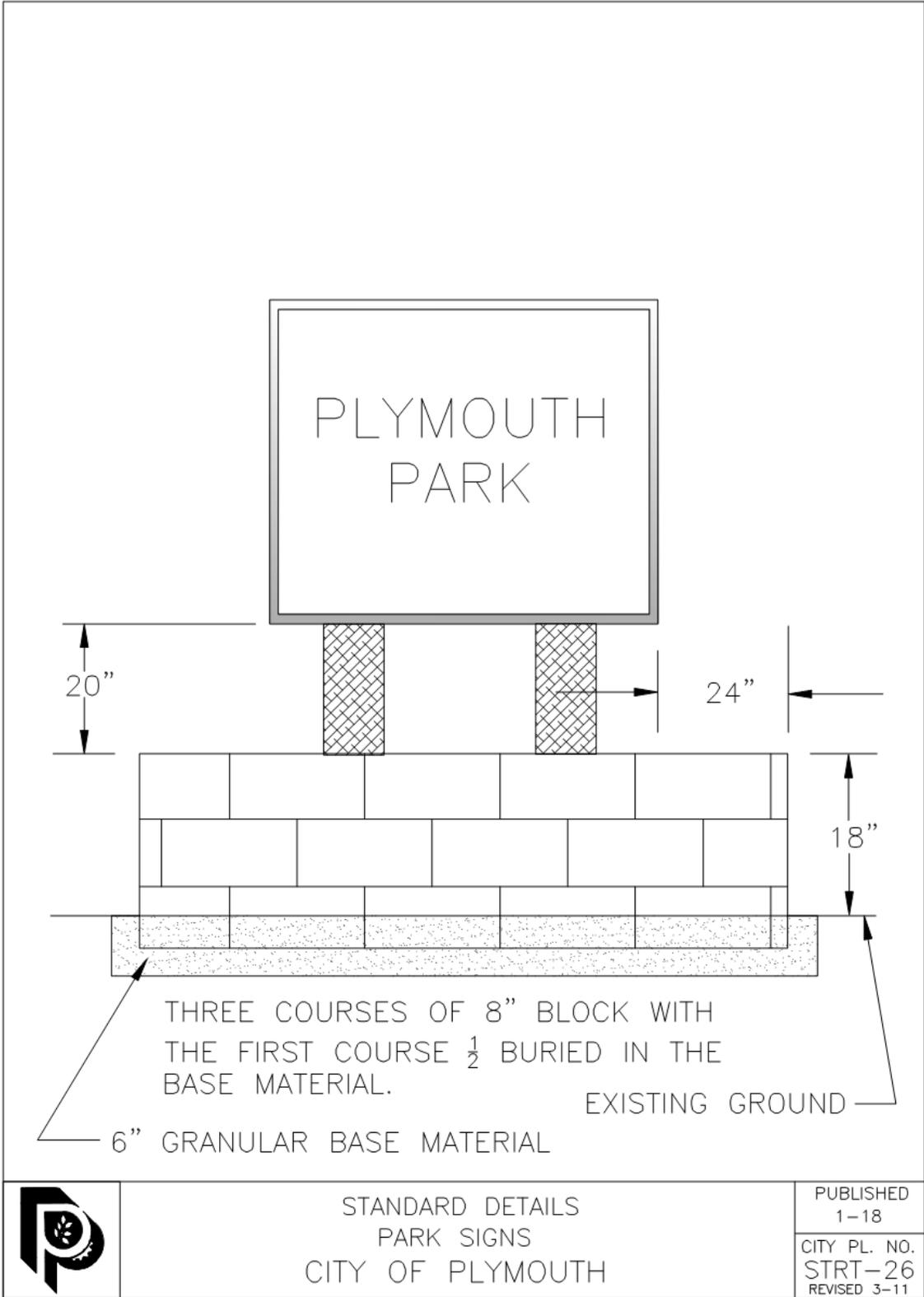


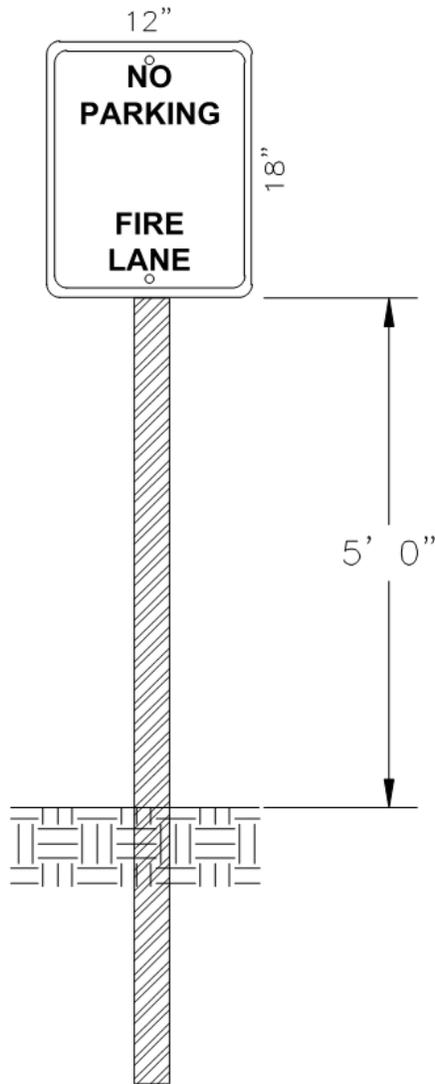
STANDARD DETAILS
STREET NAME MARKER
CITY OF PLYMOUTH

PUBLISHED
1-18

CITY PL. NO.
STRT-24
REVISED 3-16







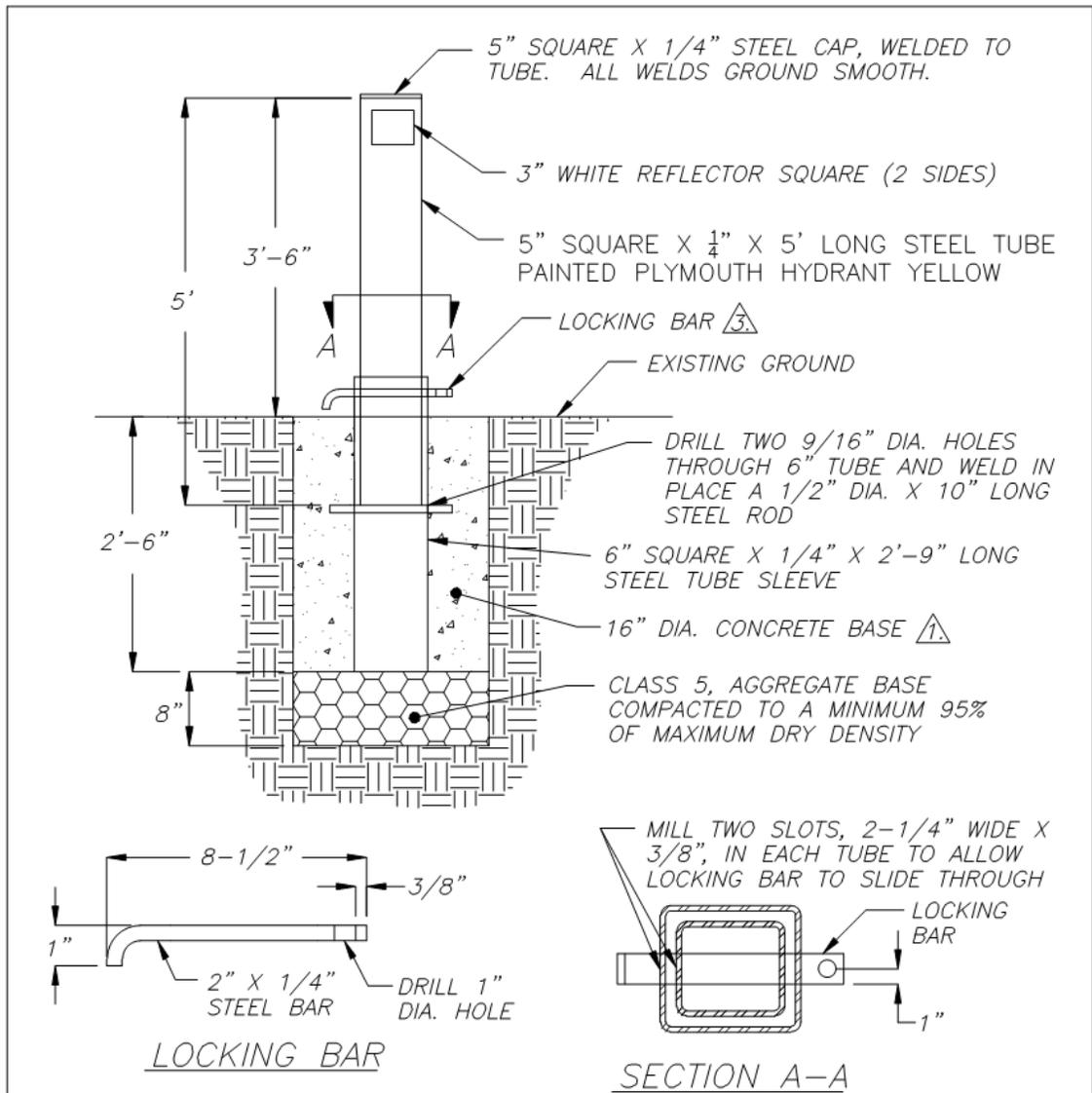
1. USE LYLE SIGN, "NO PARKING FIRE LANE, LR7-22 OR APPROVED EQUAL. SIGN MUST BE A MINIMUM OF 12" X 18", ALUMINUM PLATE, .080 MIN. THICKNESS, HIGH INTENSITY SHEETING, INSTALLED AT A HEIGHT 5' ABOVE GROUND, WITH RED LETTERING ON WHITE BACKGROUND (STANDARD).
2. THE SIGN SUPPORTS WILL BE A U POST, PAINTED GREEN. THE MATERIALS AND INSTALLATION REQUIREMENTS ARE PER DETAIL STRT-20 UNDER THE "POSTS" SECTION.
3. THE SUPPORTING POSTS SHALL BE SET BACK A MINIMUM OF 12" BUT NOT MORE THAN 36" FROM THE CURB ON BOTH SIDES OF THE FIRE LANE/Private Drive.
4. ALL SIGNS SHALL FACE THE DIRECTION OF TRAVEL AND BE INSTALLED ACCORDING TO THE LOCATIONS IDENTIFIED BY THE CITY ON THE APPROVED SITE PLAN FOR THE DEVELOPMENT.
5. A FIRE LANE SHALL BE REQUIRED IN FRONT OF FIRE DEPARTMENT CONNECTIONS EXTENDING 5 FEET ON EACH SIDE AND ALONG ALL AREAS DESIGNATED BY THE BUILDING OFFICAL.
6. ANY DEVIATION FROM THE ABOVE REQUIREMENTS SHALL BE SUBMITTED IN WRITING, WITH A REVISED SITE PLAN, FOR PRIOR APPROVAL BY THE BUILDING OFFICAL.



STANDARD DETAILS
 REQUIREMENT FOR FIRE LANE SIGNAGE ON PRIVATE DRIVES
 CITY OF PLYMOUTH

PUBLISHED
 1-18

CITY PL. NO.
 STRT-27
 REVISED 3-11



NOTES:

- ¹ PORTLAND CEMENT CONCRETE SHALL HAVE THE FOLLOWING CHARACTERISTICS: 3000 PSI MINIMUM COMPRESSIVE STRENGTH AT 28 DAYS, MINIMUM 6 SACKS OF CEMENT PER CUBIC YARD WITH A SLUMP AT 1 TO 4 INCHES.
- 2. ALL WELDS AND BENDS SHALL BE SMOOTH, EVEN AND PAINTED.
- ³ DEPENDING ON THE APPLICATION, THE CITY OF PLYMOUTH SHALL PROVIDE THE PADLOCK AND MAINTAIN THE KEYS.



STANDARD DETAILS
REMOVABLE BOLLARD
CITY OF PLYMOUTH

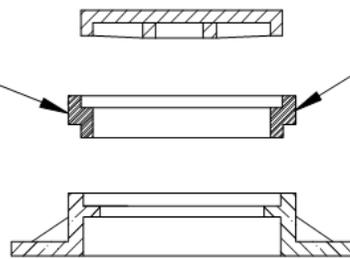
PUBLISHED
1-18
CITY PL. NO.
STRT-28
REVISED 3-11

NEENAH R-1772-B
MANHOLE FRAME (24")

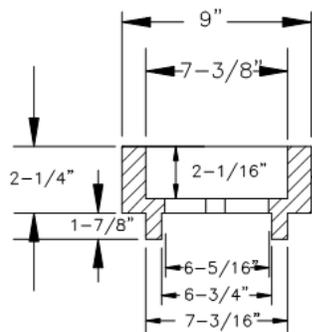
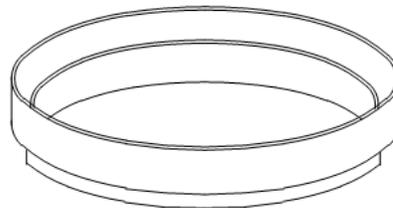
ESS BROTHERS 307,
NEENAH NO. R-1979
D-1=2" RISE
D-2=2-1/2" RISE
D-3=3" RISE
OR APPROVED EQUAL

NEENAH R-1642-B
MANHOLE FRAME (27")

ESS BROTHERS 309,
NEENAH, NO. R-1979
M-1=2" RISE
M-2=2-1/2" RISE
M-3=3" RISE
OR APPROVED EQUAL



NO 2-PIECE RINGS
WILL BE ALLOWED



TYPE A

VALVE BOX RISER TO FIT THE
TYLER NO. 6850, 6855, 6860
OR 6865 TOP SECTION AND THE
TYLER 6850-6855 OR 6860-
6865 DROP COVER, OR APPROVED EQUAL.



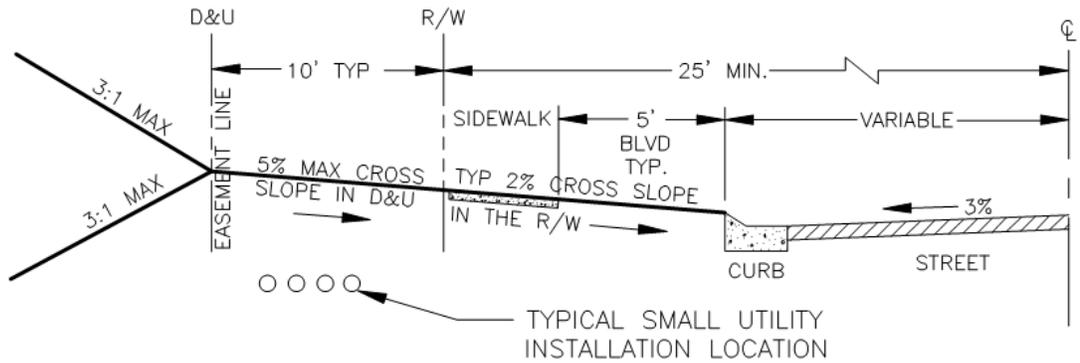
STANDARD DETAILS
RISERS FOR EXTENSION OF
GATE VALVES & MANHOLES
CITY OF PLYMOUTH

PUBLISHED
1-18

CITY PL. NO.
STRT-29
REVISED 3-11

NOTE:

1. RIGHT-OF-WAY BOULEVARDS BEHIND STREET CURBS SHALL BE GRADED WITH A 2% CROSS SLOPE TOWARDS THE STREET. THE D&U EASEMENT AREA MAY BE GRADED WITH A 5% MAXIMUM CROSS SLOPE TOWARDS THE STREET.
2. ALL GRADING SHALL BE SUBSTANTIALLY COMPLETE PRIOR TO THE START OF UTILITY INSTALLATION.
3. NO OFF ROAD GRADING EQUIPMENT SHALL BE DRIVEN OVER ANY NEW OR EXISTING UNDERGROUND UTILITIES.



RETAINING WALL NOTES:

1. RETAINING WALL INSTALLATION REQUIRES A PERMIT.
2. RETAINING WALLS AND THEIR SUPPORTING SYSTEMS CANNOT BE PLACED WITHIN THE STREET RIGHT-OF-WAY OR THE DRAINAGE AND UTILITY EASEMENTS.



STANDARD DETAILS
TYPICAL RIGHT-OF-WAY CROSS SECTION
CITY OF PLYMOUTH

PUBLISHED
1-18

CITY PL. NO.
STRT-30
REVISED 1-17



MnDOT ADA Compliance Checklist (Curb Ramp)

SP: City: District:
 Intersection: Quadrant:
 Ramp Type: Const. Year:

Compile all relevant document (photos, notes, etc) of the completed quadrant and send to ADAComplianceChecklists.dot@state.mn.us

- (1) Minimum 4' wide pedestrian access route (PAR) maintained? Yes No
- (2) Landing meets min. 4'x4' and perpendicular grade break(s)? Yes No
- (3) Are landing(s) located at the top of each ramp and at change(s) in direction and at inverse grades? Yes No
- (4) Landing slopes (%): (TH) (TH) (SS) (SS)
- (5) Ramp's running slope (%): TH Initial TH Secondary SS Initial SS Secondary
- (6) Ramp's cross slope (%): TH Initial TH Secondary SS Initial SS Secondary
- (7) Gutter flow line slope (%): TH SS
- (8) Gutter inslope (%): TH SS
- (9) Roadway cross slope (%): TH SS
- (10) Do truncated domes cover the entire curb opening and are they properly oriented? Yes No
- (11) Are gutter line and ramps draining properly? Yes No
- (12) Are there any vertical discontinuities greater than 1/4"? Yes No
- (13) Do ramps comply with Spec 2521.3? Yes No
- (14) Are ramps fully compliant? Yes No

TH = Trunk Highway
SS = Side Street

If **NO**, check the reason(s) below. Explain why the ramp didn't meet compliance and how the ramp has been improved from the pre-construction condition (see ADA Compliance Checklist Guidance for more info and attach pages if needed).

- Topography Structure(s) Utilities Contractor MnDOT

- (15) Was the curb ramp able to be built according to the plan details? Yes No

If **NO**, please explain:

Printed Name: Date (mm/dd/yyyy):

I certify that the information entered on this form is accurate to the best of my knowledge and that I fully understand the checklist standards and am qualified to carry out the inspection.

FILL OUT FORM AND SAVE. ZIP ALL SAVED FILES AND SUBMIT TO MNDOT ADA

SECTION 02410

BITUMINOUS DRIVEWAY & TRAIL REPLACEMENT (MNDOT 2231)

02410.1 DESCRIPTION

This section includes the removal and replacement of driveway or trail pavements.

02410.2 RELATED SECTIONS AND REFERENCES

- A. [Section 02000](#) - Removing Pavement and Miscellaneous Structures.
- B. [Section 02400](#) - Street Construction Specification
- C. [Section 02990](#) - Measurement and Payment
- D. [MNDOT 2231](#) - Bituminous Surface Reconditioning
- E. [MNDOT 2360](#) - Plant Mixed Asphalt Pavements

02410.3 SUBMITTALS

CONTRACTOR shall submit a mix design for bituminous patching mixture.

02410.4 MATERIALS

- A. Bituminous Patching Mixture:
 - 1. Shall be in accordance with the most current [MNDOT 2360](#) Specification.
 - 2. Shall be Type SPWEA240B, PG 58-28, wearing course mixture for all driveways and trails.

02410.5 CONSTRUCTION REQUIREMENTS

- A. Existing pavement depths are unknown and will vary greatly.
- B. A clean, vertical edge, approved by the ENGINEER, is required for all removal areas. A saw cut is generally required. An approximate removal line will be given prior to curb and gutter installation, however, the final removal mark will be determined once curb and gutter has been installed.

02410.6 DRIVEWAY AND TRAIL INSTALLATION

- A. Replace only portions of trail or driveway marked by the ENGINEER.
- B. Remove pavement, aggregate base and subgrade to accommodate required cross section.
- C. Replace pavements with a minimum of 3" bituminous or the existing pavement cross section, whichever is greater.
- D. Replace aggregate base with a minimum of 6" Class 7 or the existing aggregate cross section, whichever is greater.
- E. Driveway pavements shall be placed in 2" maximum lifts and compacted with appropriate equipment until there is no further evidence of consolidation.

END OF SECTION

SECTION 02420

POROUS BITUMINOUS PAVEMENT

02420.1 DESCRIPTION

This work shall consist of constructing a stabilized aggregate base on the prepared subgrade in accordance with [MNDOT Specification 2211](#) and the placement of a porous pavement section including drain tile.

02420.2 REFERENCES

- A. [Section 02990](#) - Measurement and Payment
- B. [MNDOT - Spec 2360](#), Plant Mixed Asphalt Pavement.
- C. [MNDOT - Spec 2363](#), Permeable Asphalt Stabilized....
- D. [MNDOT - Spec 2365](#), Stone Matrix Asphalt
- E. [MNDOT - Spec 2357](#), Bituminous Tack Coat.
- F. [MNDOT - Spec 3138](#), Aggregates for Surface and Base Courses.
- G. [MNDOT - Spec 3139](#), Grade Aggregate for Bituminous Mixtures.

02420.3 SUBMITTALS

- A. Certification of Materials: Bituminous mix plant shall have, on file, a report by MnDOT certifying that materials are in accordance with Specification requirements.
- B. Job-Mix Design: Bituminous mix plant shall have, on file, a report by an approved testing laboratory (MnDOT or independent laboratory) that indicates the proportions of materials used in each type of bituminous course being provided and temperature of mix.
- C. Samples: Provide samples of materials for laboratory testing and job-mix design.
- D. During paving, Contractor and Engineer shall obtain mix samples for determination of the actual bituminous mixture properties during production. Each paired intersection shall be considered as a separate lot.
- E. Certificates: Provide certificates, signed by the hot mix asphalt producer and Contractor, certifying that materials comply with Specification requirements.

02420.4 QUALITY ASSURANCE

- A. Subcontractor's Qualifications: Construction of bituminous paving, including stabilized aggregate base, shall be done by a responsible Paving Subcontractor having necessary equipment, plant, and not less than 10 years' experience in performing Work similar to that included under this Contract.
- B. Governing Codes: Work of this section occurring on public property shall be constructed in accordance with laws, ordinances, rules, regulations, and orders of any public authority having jurisdiction. Where such work is required to be constructed in a manner differing from the Contract Documents, Contractor shall notify Engineer before proceeding with Work.
- C. Qualifications of Hot Mix Asphalt Producer: Use only materials which are furnished by a bulk asphalt concrete producer regularly engaged in production of hot-mix, hot-laid asphalt concrete. The plant shall be a MnDOT certified plant.
- D. In addition to other specified conditions, comply with the following minimum requirements:
 - 1. The Owner will employ and pay for the services of a testing and inspection service (Engineer) for quality control testing.

2. The Engineer will obtain hot-mix asphalt samples (from the truck box) prior to compaction for purposes of determining maximum specific gravity, bulk density, and in-place voids.
 3. The Engineer will test in-place asphalt concrete courses for compliance with requirements for density, thickness and surface smoothness.
 4. Provide final surfaces of uniform texture, conforming to required grades and cross-sections.
 5. Take not less than six (6) - 4" diameter pavement specimens for each completed course, from locations as directed by Engineer. Provide specimens to the Engineer.
 6. Repair holes from test specimens as specified with porous mix.
- E. Density Requirements; Engineer will determine mixture voids and in-place voids after compaction.
- F. Thickness: In-place compacted thicknesses will not be acceptable if exceeding following allowable variation from thickness shown on drawings.
1. THE TOTAL THICKNESS OF ANY BITUMINOUS PAVEMENT SHALL NOT BE LESS THAN THE AGGREGATE DIMENSION OF THE BITUMINOUS COURSES SHOWN ON THE DRAWINGS. The Contractor is responsible to complete yield checks and monitor thickness determinations so that the constructed dimensions correspond with required plan dimensions throughout the sections.
- G. Surface Smoothness:
1. Test finished surface of each asphalt concrete course for smoothness, using a 10' straight edge applied parallel to and at right angles in Centerline of paved areas.
 2. Check surfaced areas at intervals directed by Engineer.
 3. Surfaces will not be acceptable if exceeding the following:
 1. Wear Course: 3/16" in 10'.
- H. Thickness and surface smoothness requirement is for occasional variations and not for continuous over-running or under-running, unless ordered or authorized by the Engineer.

02420.5

SITE CONDITIONS

- A. Weather Limitations:
1. Construct porous hot mix asphalt courses only when atmospheric temperature is above 50° F, when dry, and when weather is not inclement.
 2. Paving shall not take place when, in the opinion of the Engineer, the weather or surface conditions are considered unfavorable.
- B. Grade Control: Establish and maintain the required lines and grades, including crown and cross-slope, for each course during construction operations.
- C. Protection: Protect grass, vegetation, concrete work, building and other work adjacent to paving, with building paper or other suitable material, so that stains of bitumen shall not reach these surfaces.
- D. Traffic Control:
1. Maintain vehicular and pedestrian traffic during paving operations as required for other construction activities.
 2. Provide flagmen, barricades, warning signs, and warning lights for movement of traffic and safety and to cause the least interruption of work.
- E. Coordination and Responsibility
1. Coordinate pavement construction with casting adjustments.
 2. Coordinate installation of subgrade, drain tile, reservoir layer and geotextile fabric with Contract and any subcontractor.

3. Coordinate street construction with Electrical contractor for installation of conduits, light pole bases and other electrical items.
4. Prime Contractor shall present for approval a program for sequencing activities.

02420.6 REQUIREMENTS

- A. Job-Mix Criteria:
 1. Provide job-mix formulas for each required asphalt-aggregate mixture.
 2. Establish a single percentage of aggregate passing each required sieve size, a single percentage of asphalt cement to be added to aggregate, and a temperature range at which hot mix asphalt is to be produced.
 3. Comply with the mix requirements of the Minnesota Department of Transportation (MnDOT) special provisions [2360](#).
 4. Maintain material quantities within allowable tolerances of the governing standards.

02420.7 MATERIALS

- A. POROUS PAVEMENT SUB-LAYERS
 1. Aggregates consist of a Choker Layer and a Reservoir Layer. These aggregates shall meet the following common requirements:
 - a. Maximum Wash Loss of 1.5%.
 - b. The Los Angeles Rattler (LAR) loss on the coarse aggregate fraction (material retained on the 4.75 mm [No. 4] sieve) shall not exceed 35% for any individual source used within the mix.
 - c. Material shall be 80% crushed (one fractured face).
 - d. The use of recycled materials will not be permitted. Recycled materials shall include, but are not limited to: glass, recycled asphaltic pavement, crushed concrete, and roofing shingles.
 2. Choker Layer. Aggregate for the choker layer shall be uniformly graded meeting modified AASHTO #57:

Modified AASHTO size number 57

U.S. Standard Sieve Size	Percent Passing
1 ½ " (37.5mm)	100
1" (25 mm)	95-100
½ " (12.5 mm)	25-60
4 (4.75 mm)	0-10
8 (2.36 mm)	0-5

Note: Estimate a nominal 1" thickness in place.

3. Reservoir Layer: Coarse aggregate for the reservoir layer shall be uniformly graded meeting modified AASHTO #3:

Modified AASHTO size number 3*

U.S. Standard Sieve Size	Percent Passing
2 ½ " (63mm)	100
2" (50mm)	70-100
1 1/2" (37.5mm)	35-70
½ " (12.5mm)	0-5

*As a substitution, a uniformly graded gradation with a minimum void space of 40% is allowed according to AASHTO T19.

4. Geotextile Fabric: Type V, woven geotextile, or approved equal.
- B. Porous Pavement: MnDOT Spec 2363 with the following modifications:
1. Replace [2363.1](#) DESCRIPTION with:
This work consists of the construction of a Porous Hot Mix Asphalt Wearing Course Mixture (Porous HMA). The work shall be in accordance with these specifications and shall conform to the lines, grades, thicknesses, and typical cross-sections shown on the plans or established by the Engineer.
 2. [3139.2B.1](#). Utilize Class A aggregate in Porous HMA.
 3. Modify table [3139-2](#) Gradation Requirement as follows:

Table 2360.2-E
Aggregate Gradation Broad Bands
(% passing of total washed gradation)

Sieve Size, mm (inch)	Porous HMA
19.0 (3/4")	100
12.5 (1/2")	85-100
9.5 (3/8")	55-75
4.75 (#4)	10-25
2.36 (#8)	5-10
0.075 (#200)	2-4

Note: It is estimated that the mixture unit weight will be approximately 95 to 100 lbs./sq/yd-inch.

4. Replace 2365.2A.2 (Los Angeles Rattler [LAR] Test) with:
The Los Angeles Rattler loss on the coarse aggregate fraction (material retained on the 4.75mm [#4] sieve) shall not exceed 35 percent for any individual source used within the mix.
5. B 1 Mineral Filler AASHTO M17
B1a Composition:
Mineral filler shall consist of carbonate dust, Portland cement, hydrated lime, crushed rock screening, or rotary limekiln dust.

Crushed rock screenings to be used as mineral filler shall be of such composition and quality that the bituminous mixture containing the rock screenings will have stability and durability equivalent to those of the comparable mixture containing one of the other acceptable filler materials. The rock screenings shall be free from clay and shale.

Mineral filler prepared from rock dust, slag dust, and similar materials shall be free from organic impurities and have a plasticity index not greater than 4 (AASHTO T 90).

B1a1 Hydrated Lime:

Hydrated lime used in asphalt mixtures shall meet the requirements of ASTM C977 and have a maximum of eight percent un-hydrated oxides (as received basis).

B1b Gradation:

Mineral filler shall be graded within the following limits:

Percent finer than 0.600mm (#30)	100
Percent finer than 0.300mm (#50)	95-100
Percent finer than 0.075mm (#200)	70-100

B1c Condition:

Mineral filler that is to be added directly to the dried aggregate for the bituminous mixture shall be thoroughly dry and free from lumps consisting of aggregations of fine particles.

Crushed rock screenings used as mineral filler shall be of uniform gradation and shall be processed and handled in such a manner as will prevent segregation. The rock screenings shall be dried by passing through the dryer.

B1d Sampling and Testing

- 1) Sampling.....MNDOT Bituminous Manual
- 2) Fineness
 - Sieve Analysis..... AASHTO T 27
 - Hydrometer Analysis..... AASHTO T 88
 - a) This procedure is modified to permit the use of Gum Arabic as a dispersing agent if flocculation occurs.
- 3) Plasticity IndexAASHTO T 89 & 90
- 4) Specific GravityAASHTO T100

6. Insert: Materials MNDOT 2365.2C

SMA Asphalt StabilizerAASHTO 305

Use a cellulose fiber asphalt stabilizer additive to control drain-down in the SMA mixture. Feed the stabilizing additive through a separate system that proportions the required amount of stabilizer in uniform distribution at a dosage rate within 0.2-0.4 percent by weight of the total mix. The system must have low-level and no-flow indicators and a printout of the feed rate in lbs./min. Additionally, the stabilizer supply line must include a section of transparent pipe for observing consistency of flow or feed.

Stabilizer dosage rate shall be within 0.2-0.4 percent by weight of the total mix.

7. Asphalt Binder Grade MNDOT Table 2360-2

The asphalt binder material shall be asphalt grade PG 58-28.

Asphalt binder material shall conform to AASHTO M 320. Confirm binder performance grade with Engineer.

8. Mixture Design General

Include:

- 1. No paving will be allowed without a Contractor or consultant laboratory job mix formula design using Gyrotory (50 gyrations) mix design. The Contractor shall provide all data necessary (aggregate and mixture) and pay all costs.

2. All mixture shall be designated as wearing course.
 3. Additional information can be found in Appendix A of NAPA's Porous Asphalt Pavements, Quality Improvement Series 131, however these specs shall take precedence.
9. Insert B1a Desired Aggregate Blend
- Prior to the start of asphalt production, the Contractor shall provide:
- a. Dry-rodded voids in coarse aggregate of the coarse aggregate fraction (VCA_{DRC}).
 - b. Voids in the coarse aggregate of the mix (VCA_{MIX}) according to the following steps.
 - 1) For each trial gradation prepare three batches at between 6.0 and 6.5 percent asphalt binder. Include fibers if used.
 - 2) Compact two specimens from each trial gradation using 50 gyrations of the Superpave gyratory compactor.
 - 3) Use the remaining sample from each trial gradation to determine the theoretical maximum specific gravity (G_{mm}) of each trial.
 - 4) To select design gradation, choose the trial gradation with the $VCA_{MIX} < VCA_{DRC}$ with high air voids.

10. Modify Table 2365-2 as follows:

Table 2365-2 SMA Mixture Aggregate Requirements	Porous SMA
Coarse Aggregate Angularity (MnDOT 1214) (one face), %- Wear & Non-Wear	55
Coarse Aggregate Absorption, % MnDOT 1204	≤ 2
Voids in Coarse Aggregate (VCA_{drc}) AASHTO T19 & MnDOT 1211	$VCA_{mix} < VCA_{drc}$
Flat and Elongated Particles, max % by weight, (ASTM D 4791)	≤ 5 (5:1 ratio) ≤ 20 (2:1 ratio)
Clay Content AASHTO T 176 & MnDOT 1215	30
Total Spall in fraction retained on the 4.75 mm (#4) sieve	2.5
Maximum Spall Content in Total Sample	2.5

11. Modify Table 2365-5 as follows:

Table 2365-5 Gyratory Mixture Requirements	Porous SMA
Gyrations for N_{design}	50
Air voids, % - wear	$\geq 16\%$
Tensile Strength Ratio ⁽¹⁾ , min % at mix design	Not Applicable

Fines/Effective Asphalt	≤ 1.2
Drain down - based on a 1 hour reading at the anticipated production temperature	$\leq 0.3\%$
Stabilizer by weight of total mix, %	0.2-0.4
VCA Ratio	$VCA_{MIX} < VCA_{DRC}$

(1) Use 150mm (6-inch) specimens for gyratory.

12. Insert: 2365.2D1 Minimum Asphalt Content

The guideline for minimum percent asphalt binder is approximately 5.5 to 6.5 percent by weight of mix.

Delete Tables 2365-3 (SMA Mixture Sample Requirements) and 2365-4 (Option B Mixture Requirements).

13. Modify 2365.2D.2(10)(.1 & .2)

Using the selected design gradation, prepare mixes at the three binder contents in increments of 0.5 percent. Conduct drain down test (AASHTO T305 or ASTM D6390) on loose mix at a temperature 15 C higher than anticipated production temperature: Compact mix using 50 gyrations of a Superpave gyratory compactor and determine air void contents.

14. Insert: 2365.2D.2 Documentation, Additional Documentation for Gyratory Design: (G1a). For the trial blend(s), determine the Voids in the Coarse Aggregate-Dry Rodded Condition (VCA_{DRC}) according to AASHTO T19. The VCA ratio (VCA_{mix} / VCA_{DRC}) shall be less than 1.0, i.e. $VCA_{mix} < VCA_{DRC}$

15. Insert: 2365.2D.2(10)(.2) E13 Drain down Test AASHTO T305 drain down that exceeds 0.3% is unacceptable. The Contractor shall take appropriate action to bring drain down values into specification. This action may include checking to determine if the stabilizer is being added, if the rate of adding stabilizer is correct and checking if the mixing temperature is excessive. The drain down test shall be performed at the production plant mixing temperature.

16. Modify 2365.3A with:

SMA shall be placed with a track paver.

17. Add to 2365.3E Compaction, with:

All compaction shall be by the Ordinary Compaction Method. Compaction of the hot-mix asphalt shall take place when the surface is cool enough to resist a maximum 10-ton steel-wheeled roller [vibratory mode not allowed]. One or two passes is all that is required for proper compaction. More rolling could cause a reduction in the surface porosity which is unacceptable. Vibratory rollers and/or pneumatic-tired rollers are not allowed:

18. C4 Trench Rollers

Trench rollers shall be self-propelled and have a mass of not less than 2,960 pounds per foot of width.

19. CS Mixture Temperature Controls

Unless directed by the Engineer in writing, no paving is allowed under the Ordinary Compaction Method when the air temperature is below 50°F when

measured away from artificial heat. The minimum laydown temperature of the bituminous mix shall be 275 degrees Fahrenheit.

20. Other Guidance on Ordinary Compaction of SMA

Transporting of mix to the site shall be in vehicles with smooth, clean dump beds that have been sprayed with a non-petroleum release agent.

The porous bituminous courses shall be laid directly over the shaped choker course to the specified finished thickness.

After final rolling, no vehicular traffic of any kind shall be permitted on the surface until cooling and hardening has taken place (less than 140°F or as directed by the Engineer).

Transition to adjacent impervious bituminous paving shall be merged neatly with flush, clean line. Finished paving shall be even, without pockets, and graded to elevations shown on drawing.

Porous pavement beds shall not be used for equipment or materials storage during construction, and under no circumstances shall vehicles be allowed to deposit soil on paved porous surfaces.

Establish and maintain required lines and elevations. The Engineer shall be notified for review and approval of final stake lines for the work before construction work is to begin. Finished surfaces shall be true to grade and even, free of roller marks and free of low spots to form puddles. All areas must drain.

21. Drain tile: Shall be PVC A-2000 perforated sewer pipe conforming to ASTM specifications F949-90, D1784, D2321-83A or approved equal. Drain tile shall not be directly wrapped in geotextile fabric, unless specifically noted on the Drawings. Pipe diameter shall be 6", unless otherwise indicated on the Drawings.

22. Conduit Pipe: PVC Schedule 40 with glued joints.

02420.8 PREPARATION PRIOR TO PAVING

- A. Surface Preparation for Porous Pavement Areas
 - 1. Subgrade within limits of porous pavement areas shall NOT be compacted or subject to excessive construction equipment traffic prior to geotextile and filter layer placement.
 - 2. Bring subgrade of porous pavement area to line, grade, and elevations indicated. Fill and lightly re-grade any areas damaged by erosion, ponding, or traffic compaction before the placing of geotextile fabric.
- B. Loose and Foreign Material:
 - 1. Remove loose and foreign material from compacted sub-base surface immediately before application of paving.
 - 2. Do not displace sub-base material.
- C. Tack Coat:
 - 1. Apply to contact surfaces of previously constructed asphalt concrete or Portland cement concrete and similar surfaces.
 - 2. Apply at rate of 0.05 to 0.15 gal. per sq. yd. of surface.

3. Apply tack coat by brush to contact surfaces of curbs, gutters, manholes, and other structures projecting into or abutting asphalt concrete pavement.
4. Allow surfaces to dry until material is at condition of tackiness and to receive pavement.

02420.9 POROUS PAVEMENT AREA PREPARATION

- A. Place geotextile in accordance with manufacturer's standards and recommendations. Adjacent strips of geotextile shall overlap a minimum of sixteen inches (16"). Secure geotextile at least four feet (4) beyond porous pavement limits and take any steps necessary to prevent any runoff or sediment from entering the porous pavement limit area.
- B. Install reservoir layer and choker base course aggregate evenly over surface of geotextile, sufficient to allow placement of pavement, and notify Engineer for approval. Choker base course shall be sufficient to allow for even placement of hot-mix asphalt (HMA) but no thicker than nominal 1-inch in depth.
- C. Compaction of the coarse aggregates shall be by ordinary compaction. One pass with vibration is allowable (low amplitude, high frequency) for aggregate interlock. Continuous vibratory passes are not allowed.
- D. Following placement of aggregates, the geotextile fabric shall be folded back along all bed edges to protect from sediment washout along bed edges. At least a four-foot edge strip shall be used to protect beds from adjacent bare soil. This edge strip shall remain in place until all bare soils contiguous to beds are stabilized and vegetated. In addition, take any other necessary steps to prevent sediment from washing into beds during site development: When the site is fully stabilized, temporary sediment control devices shall be removed.

02420.10 PAVING

- A. General Requirements
 1. Contractor shall prepare the site to receive the subsequent improvements shown on Drawings and outlined herein.
 2. Remove loose and foreign materials from compacted surfaces -immediately before application of paving.
 3. Do not displace choker course material. Uniformly grade all ruts and ridges prior to installation of hot mix asphalt to provide uniform material thickness.
 4. Place mixture in as continuous an operation as practicable.
 5. Hand Placing:
 - a. Spread, tamp and finish mixture using hand tools in areas where machine spreading is not possible, as acceptable to Engineer.
 - b. Place mixture at a rate that will insure handling and compaction before mixture becomes cooler than acceptable working temperature.
 6. Joints:
 - a. Gradually make joints between old and new pavements, or between successive days' work, to ensure a continuous bond between adjoining work.
 - b. Construct joints to have same texture, density and smoothness as adjacent sections of asphalt concrete course.
 - c. Clean contact surfaces free of sand, dirt, or other objectionable material and apply tack coat.
 - d. Cut back edge of previously placed course to expose an even, vertical surface for full course thickness.
 - e. When the edges of longitudinal joints are irregular, honeycombed, or inadequately compacted, cut back unsatisfactory section to expose an even, vertical surface for full course thickness.

02420.11 CLEANING

- A. Cleaning: After completion of paving operations, clean surfaces of excess or spilled asphalt materials to the satisfaction of Engineer.

02420.12 PROTECTION

- A. After final rolling, do not permit vehicular traffic on asphalt concrete pavement until it has cooled and hardened and less than 140°F or approved by the Engineer.
- B. Provide barricades and warning devices as required to protect pavement and the general public.
- C. Cover openings of structures in the area of paving until permanent coverings are placed.

END OF SECTION

SECTION 02430

LOOP DETECTORS

02430.1 DESCRIPTION

This section covers the installation of loop detectors

02430.2 REFERENCES

- A. [Section 01600](#) - Traffic Control And Detours
- B. [Section 02990](#) - Measurement and Payment
- C. [MnDOT 2550.3K](#) - Roadway loop detector conductors shall be in accordance with the provisions of.

02430.3 LOOP DETECTOR SPLICE KIT

- A. Loop detector splice kit shall be 82-A Series [Scotchast Inline Splice Kit, Product No. 82-A](#) UPC Number: 25016.

02430.4 CONSTRUCTION REQUIREMENTS

- A. Loop Detector Splice Installation:

Contractor shall install loop detector splices according to the manufacturer's instructions and as specified elsewhere in these special provisions.

 1. Loop Detector Installation:
 - a. CONTRACTOR shall install loop detectors in accordance with applicable provisions of [MnDOT 2550.3K](#).
 - b. Loop detector roadway conductors and the loop detector lead-in cable conductions shall be properly prepared and cleaned before splicing.
 - c. Prior to installing the approved loop detector splice kit, CONTRACTOR shall solder the ends of the loop detector lead-in conductors to the roadway loop detector conductors, and shall furnish and install an appropriate sized wire nut to the soldered ends prior to installation of the splice kit.
 - d. Splice kits shall be installed in handholes in such a manner as to ensure that each splice kit is suspended and/or secured near the top to the handhole to the satisfaction of the ENGINEER (placing splice kits on top of the electrical cables and conductors is NOT acceptable).
 - e. Preformed NMC loop detectors shall be installed prior to any paving. The exact location of new loop detectors shall be determined in the field by Hennepin County and/or the ENGINEER.
 - f. CONTRACTOR must contact **Roy Doran (612-596-0293) at Hennepin County**, the agency responsible for operation of the traffic signals not along HWY 55, at least 48 hours prior to removing any pavement containing loop detectors, so that temporary changes to signal operation can be made. New loop detectors shall be installed as soon as possible after removal of existing loop detectors.
 - g. CONTRACTOR shall furnish to the ENGINEER, in triplicate, a signed and dated "Loop Detector Test Report" for each loop detector installed as part of this Contract, in accordance with [MnDOT 2565.3G3](#).

END OF SECTION

SECTION 02900

TURF ESTABLISHMENT (MNDOT 2575)

02900.1 DESCRIPTION

This section includes the establishment of herbaceous ground cover on designated areas.

02900.2 REFERENCES

- A. [Section 01300](#) – Application of Water
- B. [Section 01400](#) – Erosion Control
- C. [Section 02020](#) - Excavation and Embankment
- D. [Section 02990](#) - Measurement and Payment
- E. [MNDOT 2575](#) - Turf Establishment
- F. [MNDOT 3876](#) - Seed
- G. [MNDOT 3877](#) - Topsoil Borrow
- H. [MNDOT 3881](#) - Fertilizer

02900.3 SUBMITTALS

Submit certification from the grower stating the grass varieties contained in the sod.

02900.4 ACCEPTANCE OF WORK

- A. Turf establishment will be accepted on a total project basis.
- B. Turf Establishment will not be accepted until 30 growing days have expired since placement and sod/seed is in acceptable condition. A growing day is any calendar day exclusive of those days from June 10 to August 10 and from November 1 to April 15, or approved by ENGINEER.
- C. All erosion control items must also be in place and properly maintained prior to acceptance.
- D. Once accepted, the CONTRACTOR is relieved of any further maintenance or repair.

02900.5 DELIVERY, STORAGE AND HANDLING

- A. Deliver sod to project site within 24 hours after cutting.
- B. Place sod on the same day it is delivered.
- C. Protect seed from moisture prior to use.

02900.6 SCHEDULE OF WORK

- A. Coordinate turf establishment to minimize lag time after topsoil placement.
- B. Place sod between May 5 and June 10 or between August 10 and November 1.
- C. Sod may be placed prior to August 10 with written permission from the engineer. However, the 30 growing day period will not begin until August 10.
- D. Sow seed between April 15th and June 15th or between July 20th and September 20th.

02900.7 MAINTENANCE

- A. Maintain and repair all areas until acceptance.
- B. Promptly repair areas until acceptance.
- C. CONTRACTOR is responsible for watering sod and seed until acceptance. See [Section 1300](#) - Application of Water

02900.8**MATERIALS**

- A. Sod - shall be in accordance with [MNDOT 3878](#).
- B. Seeding & hydro seeding - shall be in accordance with the seed mix as noted on the bid form or in the special provisions.
- C. Mulch - shall be in accordance with [MNDOT 3882](#), Type I.
- D. Topsoil – shall be in accordance with [MNDOT 3877](#)
- E. Wood Fiber Blanket – shall be in accordance with [MNDOT 3885](#).
- F. Fertilizer – shall be in accordance with [MNDOT 3881](#).
- G. Compost – shall be in accordance with [MNDOT 3890](#) Grade 2 compost shall pass a 19mm (0.75IN) Sieve, in accordance with TMECC 02.02-B, "simple sieving for aggregate size classification. "Submit sample to ENGINEER for approval prior to use.
- H. Erosion Control Blanket shall be the type listed in special provisions or approved equal.

02900.9**SOIL PREPARATIONS**

- A. All sod and seed shall be placed on a minimum of 4" of topsoil, free of unsuitable materials.
- B. Remove all undesirable weeds as directed and cut edges of existing sod to provide smooth transition.
- C. Loosen topsoil on all areas with 2:1 slopes or flatter prior to seeding or sodding.
- D. Cultivate to a depth of 3" using discs or other suitable equipment.
- E. Operate equipment at right angles to direction of drainage.
- F. Fill all washouts prior to cultivation.
- G. Finish all areas to provide a smooth, moist, even-textured foundation of uniform density.
- H. Not more than ½ hour prior to seeding or sodding, fertilize topsoil using 5-15-10 fertilizer applied at a rate of 200 lb. per acre.

02900.10**CONSTRUCTION REQUIREMENTS**

- A. Placing sod:
 - 1. Prepare sodding areas prior to delivery of sod.
 - 2. Place sod strips at right angles to direction of drainage.
 - 3. Place sod strips with staggered end joints.
 - 4. Water and roll sod immediately after placement.
 - 5. Complete repair of sodded areas as directed within 5 days after placement.
 - 6. Stake sod on slopes steeper than 3:1 to prevent displacement.
- B. Placing seed:
 - 1. Apply seed mixture over designated areas at a rate called for by the seed mix.
 - 2. Apply seed uniformly by mechanical or hydro-spreading method.
 - 3. Firm all seeded areas with a drag or cultipacker immediately after seeding and prior to mulching.
 - 4. Spread mulch uniformly by mechanical means at a rate of 2 ton per acre so that approximately 10% of the soil surface is visible through the mulch.
 - 5. Apply mulch in accordance with [MNDOT 2575.3F](#). Disk anchor mulch in accordance with [MNDOT 2575.3H](#).
 - 6. Slopes steeper than 3:1 shall be stabilized with wood fiber blanket in accordance with [MNDOT 2575.3K2](#).

END OF SECTION

SECTION 02905

RAIN GARDENS

02905.1 DESCRIPTION

This section covers the construction of rain garden(s).

02905.2 REFERENCES

- A. [Section 02020](#) – Excavation and Embankment
- B. [Section 02910](#) – Plant Installation
- C. [Section 02915](#) – Retaining Walls
- D. [Section 02990](#) - Measurement and Payment
- E. [MNDOT 3861](#) – Plant Stock
- F. [MNDOT 3882](#) – Mulch, Type 6

02905.3 MATERIALS

- A. Nursery Plant Stock – In accordance with [MNDOT 3861](#).

Shrubs (Gallon Pots):	
Annabelle' Hydrangea	AH
Emerald Mound' Honeysuckle	EMH
Viburnum 'Bailey Compact' (V. trilobum)	VBC
Perennials (4" Pots):	
Sedum 'Autumn Joy'	SAJ
Liatris 'Floristan Violet'	LFV
Daylily 'Lemon Lollypop'	DLL
Blue Flag Iris (Iris versicolor)	IRIS
Black-eyed Susan 'Goldstrum'	BES
Aster 'Alma Potschke' (A. novae-angliae)	AAP
Aster 'Purple Dome'	APD
Feather Reed Grass 'Karl Forester'	FRG
Little Bluestem	LB

- B. Soil amendment will consist of a 70/15/15 soil/black dirt/sandy soil mix. Excavated soils from each rain garden are expected to be adequate for the 70% makeup.
 - 1. CONTRACTOR will be responsible for loading, hauling, unloading, mixing with excavated soils, placing and stockpiling of soil amendment at the stockpile location.
 - 2. CONTRACTOR shall avoid any compaction of rain garden soil amendment.
 - 3. Includes all costs associated with keeping the stockpile area neat, safe, and well drained, including equipment, materials, and labor.
- C. Mulch shall be a modified type 6 or approved equal.
 - 1. The mulch will consist of shredded raw wood material from hard timber. No individual piece shall exceed 5 inches in any direction.
 - 2. CONTRACTOR will be responsible for loading, hauling, unloading, placing and stockpiling of mulch at the stockpile location.

3. Includes all costs associated with keeping the stockpile area neat, safe, and well drained, including equipment, materials, and labor.
- D. Edging
1. Rain garden edging will be commercial grade, 4" x 1/8" Green Steel Edging by Sure Loc, or approved equal as stated on construction plans.
- E. Drintile will be 4" in diameter with filter sock and connected with a 4"x 4" x 4" TEE as specified on the construction plans or in the field to either the drintile in the street or a nearby catch basin. Install cleanouts at the end of each drintile run and install plastic cap flush with surface.

02905.4

CONSTRUCTION REQUIREMENTS

- A. Excavation and Backfill
1. Excavation will be on a 2:1 slope to a depth of 36 inches.
 - a. Disposal of excavated materials is the responsibility of the CONTRACTOR.
 - b. Exact location of rain garden will be staked in the field.
- B. Excavated soils will be thoroughly mixed with compost to create a 70/15/15 soil/black dirt/sandy soil mix soil amendment.
- C. Drintile will be placed at a min. depth of 30" so as to provide flow to either the drintile in the street or a nearby catch basin. Cleanouts shall be installed at the end of each drintile run and plastic cap shall be flush with the surface.
- D. Soil amendment will be placed to a depth of 24", leaving 12" of depth to the rain garden.
- E. Mulch, modified Type 6 shredded hardwoods or approved equal, will be placed to a depth of 3".
- F. Rain garden steel edging will be anchored with 12" min. stakes spaced not more than 4 feet on center and driven into at least 1" below top elevation or edging.
- G. Plant Installation in accordance with [MNDOT 2571](#).
1. The CONTRACTOR shall be required to rototill all planter areas to a depth of 6 inches that have existing topsoil prior to plant installation.
 2. The CONTRACTOR shall apply a post emergent herbicide such as Roundup, or approved equal per manufacturers' recommendations to all planting bed areas 14 days prior to planting operations. The CONTRACTOR shall remove by hand pulling, or other means, to completely remove all weed plants and roots from planting areas and dispose of material off site.
 3. The CONTRACTOR shall apply a pre-emergent herbicide such as Preen, or approved equal per manufacturers' recommendations to all boulevard and median planting areas following the installation of shrub/perennials and immediately prior to the placement of mulch.
 4. Water each plant within 2 hours of installation
 5. Delivery and Storage of Plants

- a. Required watering of stored and permanently installed materials per standard specifications to maintain plants shall be considered incidental to the unit item.
- 6. Plant Establishment Period
 - a. CONTRACTOR shall be responsible for maintenance work and care for plants installed during the Plant Establishment Period. The Plant Establishment Period shall be 2 calendar years from date of final job acceptance.
 - b. Maintenance includes:
 - I. Keeping plants in a healthy growing condition.
 - II. Repairing or replacing, as necessary, mulch and soil amendment.
 - III. Removing all weed growth in and three feet around all mulched areas.
 - IV. Furnishing and installing replacement plants as needed, including new mulch and planting soil.
 - c. Keeping all plants upright.
- 7. Acceptance of Work
 - a. ENGINEER will inspect project at the end of the plant establishment period and notify CONTRACTOR of any defects.
 - b. CONTRACTOR will replace all defective work immediately on or at the beginning of the next planting season if directed by the ENGINEER
 - c. Only plants with two full growing seasons (June 1 – October 1) of care will be subject to acceptance.
 - d. No payment will be made for unacceptable plantings.

END OF SECTION

SECTION 02910
PLANT INSTALLATION
(MNDOT 2571)

02910.1 DESCRIPTION

This section includes protecting existing trees and shrubs. As well as furnishing and planting trees/shrubs.

02910.2 REFERENCES

- A. [Section 02010](#) - Clearing and Grubbing
- B. [Section 02990](#) - Measurement and Payment
- C. [MNDOT 2571](#) - Plant Installation.
- D. [MNDOT 3861](#) - Plant Stock.
- E. [MNDOT 3877](#) - Topsoil Borrow.
- F. [MNDOT 3881](#) - Fertilizer.
- G. [MNDOT 3882](#) - Mulch, Type 6.

02910.3 MATERIALS

- A. Nursery Plant Stock - In accordance with [MNDOT 3861](#).

COMMON NAME	BOTANICAL NAME
Autumn Spire Maple	Acer Rubrum "Autumn Spire"
Black Hills Spruce	Picea Clauca Densata "Black Hills Spruce"

- B. Transplant Stock - As detailed in the plans and directed by Engineer.
- C. Growing Medium Materials:
 - 1. Select Topsoil Borrow - In accordance with [MNDOT 3877](#).
 - 2. Fertilizer - In accordance with [MNDOT 3881](#).
 - 3. Mulch, Type 6 - In accordance with [MNDOT 3881](#).
 - 4. Water - Shall be suitable for human consumption.
- D. Wound Dressing:
 - 1. Shellac
 - 2. Asphalt - Base tree paint
- E. Tree Wrapping:
 - 1. Two-ply asphalt cement crepe paper furnished in strips.

02910.4 EXECUTION

- A. General:
 - 1. Transplant and plant trees in areas as directed by Engineer.
 - 2. Install and maintain plants only with an experienced crew under direct supervision of a qualified nurseryman or landscape specialist.
 - 3. Plant only under favorable weather and soil conditions as approved by the Engineer.
- B. Protecting Existing Trees and Shrubs:
 - 1. Take all necessary measures, including temporary fencing, and minimize construction activity around existing trees and shrubs to ensure survival.
 - 2. Place orange temporary construction fence around all trees selected by the ENGINEER. Temporary fencing should be placed a distance from the tree in feet equal to the tree diameter in inches.

3. Cut existing roots only with sharp and appropriate cutting tools perpendicular to the root.
 4. Dress all wounds to oaks and crab apple trees immediately and as detailed in the plans.
- C. Delivery and Storage of Plants:
1. Install plants on day of delivery to project.
 2. Cover all plant roots until planting with a moisture-holding material such as straw, sawdust, moss or soil.
- D. Preparing Plant Holes:
1. Center holes at staked locations.
 2. Dig holes as detailed in the plans.
 3. Install draitile as shown in plan details in heavy clay or impervious soil as directed by the ENGINEER.
 4. Rototill or aerate any planting soil compacted by operations.
- E. Planting Soil preparation:
1. Prepare soil by mixing with select topsoil borrow three pound per cubic yard of 5-15-10 analysis fertilizer.
 2. Mix until thoroughly blended.
- F. Top Growth and Pruning:
1. Prune all bare roots and top growth.
 2. Remove all dead, rubbing, damaged or diseased branches.
 3. Prune trees to give tree a uniform and symmetrical appearance.
 4. Leave ladders intact while removing all stubs.
 5. All pruning shall be done immediately prior to planting as directed by the Engineer.
- G. Plant Installation:
1. Install plants plumb as shown in the plan details.
 2. Protect root system while placing and compacting backfill.
 3. Loosen all burlap and remove all wire to expose entire top of root ball.
 4. Plant bare root plants on compacted soil and backfill leaving no air voids around roots.
 5. Install plants from containers immediately after removing from container and spreading roots in a natural position.
 6. Stake bare root trees as shown in the standard details.
- H. Transplanting Salvaged Plants:
1. Transplant in locations as directed by Engineer.
 2. Transplant with same procedure used for nursery stock plants.
- I. Watering and Mulching:
1. Water each plant within two hours of planting.
 2. Water to thoroughly saturate all planting soil.
 3. Bring planting soil to specified level within five days of initial watering, and saturate additional soil.
 4. Place mulch within 48 hours of second watering and as detailed in the plans.
 5. Water all plants thoroughly at least once per week until the work is accepted.
- J. Wrapping:
1. Wrap Maple, Linden, and Locust trees from the ground to the first major branch.
 2. Apply wrap at end of growing season and remove prior to following growing season.
- K. Disposal of Excavated Materials:
1. Disposal of all excess excavated materials is the responsibility of the Contractor.
- L. Cleanup and Restoration:

1. Collect and dispose of all excess materials, packaging and containers.
 2. Restore or replace in kind all turf or other facilities damaged by Contractor's operations.
- M. Plant Establishment Period:
1. Maintain the work and care for plants installed during the Plant Establishment Period. The Plant Establishment Period which shall be one calendar year from date of final job acceptance.
 2. Maintenance includes:
 - a. Keeping all plants in healthy growing condition.
 - b. Maintaining adequate, but not excessive, soil moisture at all times.
 - c. Repairing or replacing as necessary tree wrapping, staking and guying, mulch material and planting soil.
 - d. Removing all weed growth in and three feet around all mulched areas.
 - e. Applying insecticide spray as necessary.
 - f. Furnishing and installing replacement plants as needed, including new mulch and planting soil.
 - g. Keeping all plants upright.
 - h. The contractor will be held responsible for all plants lost due to acts of vandalism, theft and rodent damage during the plant establishment period.
- N. Acceptance of Work
1. Engineer will inspect project at the end of the plant establishment period and notify Contractor of any defects.
 2. Contractor will replace all defective work immediately on or at the beginning of the next planting season if directed by the Engineer.
 3. Only plants with one full growing season (June 1 to October 1) of care will be subject to acceptance.
 4. No payment will be made for unacceptable plantings.

END OF SECTION

SECTION 02915
RETAINING WALLS

02915.1 DESCRIPTION

Section includes construction of modular block retaining walls.

02915.2 REFERENCES

- A. [Section 02020](#) - Excavation and Embankment
- B. [Section 02990](#) - Measurement and Payment
- C. [MNDOT Specification 2411](#) Minor Concrete Structures
- D. [MNDOT 3149](#) - Granular Material

02915.3 MATERIALS

- A. Wall materials shall be Modular Concrete Block systems or approved equal.
 - 1. Block units size shall be called out on the bid form or in the special provisions.
 - 2. Only Modular block from [MNDOT's "Approved/Qualified Products"](#) list can be used.
 - 3. All block shall be from the same manufactured run to avoid color variations.
 - 4. The alignment/shear pins shall be provided per manufacture's recommendation.
- B. Base and backfill material shall be select granular aggregate in accordance with [MNDOT 3149.2F](#) excluding crushed carbonate quarry rock, crushed concrete and salvaged bituminous mixture.
- C. Geogrid reinforcement shall be [Tensar UX1400](#), [Mirafi Miragridp-TS](#) or approved equal.

02915.4 CONSTRUCTION REQUIREMENTS

- A. Excavation and Backfill
 - 1. Excavate for wall as detailed on the plans.
 - 2. Protect trees as shown in the plans.
 - 3. Place wall on 6 inch layer of Class 5 Aggregate Base, or optional non-reinforced concrete leveling pad with a minimum thickness of 6 inches.
 - 4. Backfill wall in uniform 8" lifts of crushed stone.
 - 5. Fill all voids in blocks with crushed stone.
 - 6. Do not operate mechanical compacting equipment directly on top of the precast block units.
- B. Wall Placement
 - 1. Install all units horizontal, plumb and according to manufacturer's recommendations.
 - 2. All units shall be interlocked per manufacture's recommendation.
 - 3. Seal all exposed and open end modules with mortar.
 - 4. Secure precast block cap layer with construction adhesive, epoxy cement or mortar according to the manufacturer's recommendations.
- C. Surface Sealing
 - 1. Surface Sealant shall be applied to all exposed wall faces. Use [MnDOT approved Segmental Masonry Wall Sealants](#). Submit product specification sheet to the project engineer for approval prior to application.

END OF SECTION

SECTION 02990

MEASUREMENT AND PAYMENT

02990.1 SUMMARY

All items will be measured separately according to design designation as indicated in Bid Form by the Pay Item name and as may be detailed and defined in the Plans, Specifications, or Special Provisions. Complete-in-place items shall include all component parts thereof as described or required to complete the unit, but excluding any excesses covered by separate Pay Items.

02990.2 RELATED SECTIONS

SECTION	01050	-WEEKLY CONSTRUCTION MEETING
SECTION	01100	-MOBILIZATION AND DEMOBILIZATION
SECTION	01200	-TEMPORARY DOMESTIC WATER
SECTION	01300	-APPLICATION OF WATER
SECTION	01400	-EROSION CONTROL
SECTION	01500	-AIR, LAND AND WATER POLLUTION
SECTION	01600	-TRAFFIC CONTROL AND DETOURS
SECTION	01700	-APPLICATION OF CALCIUM CHLORIDE
SECTION	01800	-CONTRACTORS SIGN
SECTION	01900	-MAINTENANCE AND FINAL CLEAN UP
SECTION	02000	-REMOVING PAVEMENT AND MISCELLANEOUS STRUCTURES
SECTION	02010	-CLEARING AND GRUBBING
SECTION	02020	-EXCAVATION AND EMBANKMENT
SECTION	02100	-SANITARY SEWER CONSTRUCTION
SECTION	02200	- WATERMAIN CONSTRUCTION
SECTION	02300	-STORM SEWER CONSTRUCTION
SECTION	02400	-STREET CONSTRUCTION
SECTION	02410	-BITUMINOUS DRIVEWAY & TRAIL REPLACEMENT
SECTION	02420	-POROUS BITUMINOUS PAVEMENT
SECTION	02430	-LOOP DETECTORS
SECTION	02900	-TURF ESTABLISHMENT
SECTION	02905	-RAIN GARDENS
SECTION	02910	-PLANT INSTALLATION
SECTION	02915	-RETAINING WALLS

02990.3 GENERAL MEASUREMENT AND PAYMENT

- A. Unit Quantities Specified:
1. Quantities and measurements indicated in the Bid Schedule are for bidding and contract purposes.
 2. A Change Order may be submitted if the scope of work changes. Change Order approval will be required from the OWNER.
- B. Measurement and Quantities:
1. Measurement of quantities expressed as volume are based upon a neat plan line protection to the work limits as determined on the Bid Form for each item with no additional allowances for shrinkage, swelling, or creep. In computing volumes of excavation and fill, the average end area method or other methods, is used.

2. Measurements of quantities expressed as area shall be based upon square dimensions using mean length and width or radius.
 3. Measurement of quantities expressed as linear foot shall be based on the length projected in the plan view based on survey points (i.e., slopes projected flat).
 4. Lump Sum/Price Measurement: Items measured by volume, area, or linear means or combinations, as appropriate, as a completed item or unit of work.
 5. Measurement of Items expressed as diameter will be determined by measuring the circumference and divided by 3.14 and then rounded up or down to the nearest inch.
- C. Payment:
1. Payment for each lump, sum and unit price stated in the Bid Tab shall constitute full compensation for all required labor, products, tools, equipment, plant, transportation, services, and incidentals: erections, application on installation of an item of the work required to complete all work specified under that particular item including cleanup, and all costs for doing related work as set forth in these specifications and/or on the Drawings or implied in carrying out their intent. The price bid sum stated in the itemized bid shall be deemed to include an allowance for overhead and profit.
 2. Final payment for work governed will be made on the basis of bid quantities accepted by OWNER.
 3. Requests for payment shall be in accordance with the General and Supplementary Conditions of the Construction Agreement.
 4. Payment will be made to the limits as specified in the Contract Documents and as shown on the Drawings. The payment for quantities that exceed the contract quantities can only be obtained through an approved Change Order before contract quantities are exceeded. Change Orders shall only be approved in the scope of work specified in the Contract Documents and Drawings.
 5. No partial payments shall be made for the installation of items which have not been tested and approved.
 6. Payment for unit price items will be made monthly until completion of each unit price based on quantity estimated by CONTACTOR, and verified by OWNER. Final payment will be based on actual field measured quantities.
- D. Defect Assessment:
1. Replace the work, or portions of the work, not conforming to specified requirements.
 2. If, in the opinion of OWNER, it is not practical to remove and replace the work, OWNER will direct one of the following remedies:
 - a. The defective work may remain, but the unit/price will be adjusted to a new sum/price at the discretion of OWNER.
 - b. The defective work will be partially repaired to the instructions of OWNER, and the unit/sum price will be adjusted to a new sum/price at the discretion of the OWNER.
 3. The individual specification sections may modify these options or may identify a specific formula or percentage sum/price reduction.
 4. The authority of OWNER to assess the defect and identify payment adjustment is final.
- E. Non-Payment for Rejected Products:
1. Payment will not be made for any of the following:
 - a. Products wasted or disposed of in a manner that is not acceptable.
 - b. Products determined as unacceptable before or after placement.
 - c. Products not completely unloaded from the transporting vehicle.
 - d. Products placed beyond the lines and levels of the required work.

- e. Products remaining on hand after completion of the work
- f. Loading, hauling, and disposing of rejected products

02990.4 BID ITEMS:

Listed by specification section number

02990.4-01050 WEEKLY CONSTRUCTION MEETING

Basis of Payment: All associated costs are considered incidental. No direct payment will be made.

02990.4-01100 MOBILIZATION AND DEMOBILIZATION

- A. Basis of Measurement: The Work required for this item will be measured on the basis of satisfactory evidence of mobilization and demobilization of sufficient labor, equipment, and material to adequately advance the work.
- B. Basis of Payment: According to the lump sum price as stated on the bid form. The lump sum bid amount shall not exceed 5% of the total bid amount.

Work includes preparatory work, dewatering, all personnel, equipment, supplies and incidentals, including but not limited to, those necessary for the movement to and from the project site. Included in the CONTRACTOR'S Lump Sum Contract for mobilization as stated on the bid form. Progress payment amounts for mobilization will be determined by the percentage of the total contract completed based on the following schedule:

Percent of Contract Completed	Percent of Item Paid
10	60
30	80
90	90
100	100

02990.4-01200 TEMPORARY DOMESTIC WATER

- A. Basis of Measurement: Lump Sum
- B. Basis of Payment: According to the lump sum price as stated on the bid form. Progress payment amounts for the temporary watermain will be determined by continued proper maintenance of all devices.

Maintenance Compliance	% of Item Paid
Installation	30
Removal	100

02990.4-01300 APPLICATION OF WATER

- A. Basis of Measurement: Gallons
 - 1. Measure specifically designated water by volume in 1000(M) gallon increments. Measure only water for dust control and turf establishment per the specifications or as approved by the ENGINEER prior to application.
 - 2. Deduct for volumes wasted through CONTRACTOR'S failure to coordinate application with other operations as required.
 - 3. Deduct for volumes used for construction purposes other than dust control or turf establishment.

4. Deduct \$500 per day that the turf establishment areas are not watered per the specifications unless prior written authorization is received from the ENGINEER.
- B. Basis of Payment: Payment for acceptable quantities of water for dust control and water for turf establishment shall be at the Contract Unit Price as listed on the Bid Form. All associated work items shall be considered incidental. Payment for water will be made based on the following schedule:

ITEM	UNIT
Water for Dust Control	1000(M) Gallons
Water for Turf Establishment	1000(M) Gallons

02990.4-01400 EROSION CONTROL

- A. Basis of Measurement: Lump Sum
- B. Basis of Payment: Payment for acceptable quantities of silt fence or silt curtain shall be at the Contract Unit Price as listed on the Bid Form. All associated work items will be considered incidental. Payment for erosion control items will be based on the following schedule:

ITEM	UNIT
Silt Fence	L.F.
Inlet Protection-Type Special	Each

- C. Progress payment amounts for all erosion control items will be determined by continued proper maintenance of all devices.

Maintenance Compliance	% of Item Paid
Installation	50
Final Inspection / Removal (Project Completion)	100

- D. All storm sewer inlets not designated as Inlet Protection-Type Special shall be protected by the CONTRACTOR with no additional compensation. Failure to comply with established erosion control measures will result in withholding of progress payments by the OWNER.

02990.4-01500 AIR, LAND AND WATER POLLUTION

Basis of payment: All activities required by or relating to this section will be considered incidental unless modified by these contract documents. No direct payment will be made. No additional compensation or time extension will be granted due to actions brought against the CONTRACTOR for failure to comply with pollution control requirements.

02990.4-01600 TRAFFIC CONTROL AND DETOURS

- A. Basis of Measurement: Lump Sum No measurement will be made for individual items or equipment. Procedural and equipment revisions resulting from minor changes or field adjustments will be considered incidental.
- B. Basis of Payment: According to the unit price as stated on the bid form. All associated work items shall be considered incidental.

- C. Progress payment amounts for Traffic Control will be determined by the percentage of the total contract completed based on the following schedule:

% of Contract Completed	% of Item Paid
5%	15%
25%	40%
50%	70%
75%	90%
100%	100%

02990.4-01700 APPLICATION OF CALCIUM CHLORIDE

- A. Basis of Measurement: Gallons
 - a. Measure by volume in gallons at 60 degrees F
 - b. Convert weight to gallons based on 11.60 pounds per gallon for a 38 percent concentration.
- B. Basis of Payment. Payment for calcium chloride shall be at the contract unit price as listed on the Bid Form. All associated work items shall be considered incidental.

02990.4-01800 CONTRACTOR SIGN

- A. Basis of Payment: All associated costs are considered incidental. No direct payment will be made.

02990.4-01900 MAINTENANCE AND FINAL CLEAN UP

- A. Basis of Payment: All associated costs are considered incidental. No direct payment will be made.

02990.4-02000 REMOVING PAVEMENT & MISC. STRUCTURES

- A. Basis of Measurement: Varies by item (see BID FORM)
- B. Basis of Payment:
 - 1. Removal and disposal of bituminous curbing and bituminous pavements on all reconstructed streets shall be considered incidental to common excavation.
 - 2. Items proposed for removal shall become the property of the CONTRACTOR and shall be disposed of outside the City limits at the CONTRACTOR'S expense.
 - 3. Only items removed in acceptable condition will be measured as salvage. Salvage includes delivery to the City Public Works facility unless noted.
 - 4. Items proposed for salvage which are damaged by the CONTRACTOR'S negligence shall be replaced at the CONTRACTOR'S expense.
 - 5. Saw cutting, backfilling of depressions resulting from removals and disposal of materials not salvaged shall be incidental to removal.
 - 6. Payment for acceptable quantities of removal, salvage, install or abandon items shall be at the Contract Unit Price as listed on the Bid Form. All associated work items shall be considered incidental.
 - 7. All castings on removed structures shall be salvaged in a location determined by Engineer, to be picked up by Owner and shall be considered incidental.
 - 8. Salvage and install mailbox structure includes all mailboxes within the project area shall include all work and materials to relocate and

replace mailboxes as necessary to complete the project. Payment will be made based on the number of posts each mailbox unit has regardless of the number of mailboxes on the unit. Any damage to mailboxes during construction is the responsibility of the CONTRACTOR and will be replaced at the CONTRACTOR'S expense.

9. Provide temporary mailbox structures and locate mailboxes in accordance with the U.S. Postal service for the project area. Payment will be made once temporary mailboxes are removed.
10. Location, protection, and relocation of all Electric Dog Fences as needed shall be paid for as S & I Invisible Dog Fence.
11. Remove Concrete Curb and Gutter includes the removal of all existing concrete curb and gutter.
12. Remove Pipe (all sizes & types) includes all special sections and appurtenances.
13. Payment for Salvage and Install Fence shall include all work and materials to remove and reinstall existing fence.
14. Pipe quantities removed as a result of Remove Drainage Structure shall be incidental.
15. Removal of landscaping behind pavement shall be considered incidental, unless described in this section.
16. Removal of retaining walls under 2.0 feet in height and protection of existing retaining walls shall be considered incidental.
17. Payment for removal, salvage, abandon and install items will be based on the following schedule:

ITEM	UNIT
Abandon Water Main Pipe (All types and sizes)	Linear Foot
Abandon Storm Sewer Pipe (All types & sizes)	Linear Foot
Remove Storm Pipe (all types & sizes)	Linear Foot
Remove Watermain Pipe (all types and sizes)	Linear Foot
Remove Concrete Curb and Gutter	Linear Foot
Remove Drainage Structure	Each
Remove Retaining Wall	Lump Sum
Remove Fence	Lump Sum
Salvage Fire Hydrant	Each
Salvage Gate Valve and Box	Each
Salvage and Install Brick Paver Driveway	Square Feet
Salvage and Install Retaining Wall	Square Feet
Salvage and Install Invisible Dog Fence	Each
Salvage and Install Mailbox Structure	Each
Salvage Sign Panel, Type C	Each
Salvage and Install Fence	Linear Foot
Salvage and Install Sign Panel	Each
Temporary Mailbox Structures	Lump Sum
Mill Bituminous Surface	Square Yard
Edge Mill Bituminous Surface	Square Yard

02990.4-02010 CLEARING AND GRUBING

- A. Basis of Measurement:
 1. Individual unit basis (TREE or EACH)
 2. Determine quantity by field count of trees cleared or stumps grubbed.

3. To be counted, trees must be at least 4" in diameter at a point 2' above the ground.
 4. Diameter is measured circumference divided by 3.14.
 5. To be counted, stumps must be at least 4" in diameter at the point of cut off.
- B. Basis of Payment:
1. Removal of brush, trees, and stumps smaller than 4" in diameter shall be incidental.
 2. Pruning or trimming of branches on trees and plantings being preserved as directed by the ENGINEER shall be considered incidental.
 3. Protecting all trees not marked for removal including orange construction fence installation around critical trees as directed by the ENGINEER shall be considered incidental.
 4. Payment for acceptable quantities of clearing and grubbing shall be at the contract unit price as listed on the Bid Form. All associated work items shall be considered incidental.
 5. Payment for clearing and grubbing will be based on the following schedule:

ITEM	UNIT
Clearing	Tree
Grubbing	Tree

02990.4-02020 EXCAVATION AND EMBANKMENT

- A. Method of Measurement:
1. Common and Subgrade Excavation Material:
 - a. Measure by volume of material in its original position.
 - b. Compute volumes in cubic yards by average end area method determined from original and final cross-sections. No adjustments will be made based on the final elevations of the boulevard areas.
 - c. Bid price includes all measures necessary to protect underground utilities.
 2. Borrow Material:
 - a. Measure by volume of material in its final position.
 - b. Compute volumes in cubic yards by average end area method determined from original and final cross-sections.
 3. Geotextile Fabric:
 - a. Measure by square yards of surface area.
 - b. No measurement for joint overlap.
 4. Dewatering:
 - a. Consider as incidental to excavation.
 5. Channel Excavation:
 - a. Measure by lineal foot of channel excavation per typical ditch and channel sections as designated in the plan.
 6. Pond Excavation:
 - a. Measure by volume of material in its original position.
 - b. Compute volumes in cubic yards by average end area method determined from original and final cross-sections. Surveys to be performed by the City.
 - c. Bid price includes all measures necessary to protect underground utilities.

- B. Basis of Payment:
1. Payment for Common Excavation includes removal and disposal of asphalt pavement. Payment will not be adjusted for variations in the pavement depth.
 2. Construction of on-site embankment using suitable excavated materials shall be incidental to common excavation of that material.
 3. All dewatering shall be incidental to the appropriate bid item. The CONTRACTOR is responsible for any dewatering permit required.
 4. Payment for acceptable quantities of excavation and embankment shall be at the Contract Unit Price as listed on the Bid Form. All associated work items shall be considered incidental.
 5. Removal of landscaping behind pavement shall be considered incidental, unless modified in the bid tab.
 6. Payment for excavation and embankment will be based on the following schedule:

ITEM	UNIT
Common Excavation	C.Y.
Channel Excavation	L.F.
Subgrade Excavation	C.Y.
Select Granular Borrow (CV)	C.Y.
Geotextile Fabric Type V	S.Y.

02990.4-02100 SANITARY SEWER CONSTRUCTION

- A. Sanitary Sewer Mainline Pipe
1. Basis of Measurement: Linear Feet
 2. Basis of Payment: According to the unit price as stated on the bid form. Payment will be made at the contract unit price per lineal foot for each diameter and type of pipe furnished, which shall include the cost of furnishing the pipe, joint materials, gaskets and all other materials and of delivering, handling, placing, pipe bedding, backfilling, compacting, testing and all labor and equipment necessary to install the pipe complete in place at the depth specified.
 3. All measurements of pipe length shall be from center of manhole to center of manhole or fitting, along the axis of the pipe for each diameter and type of pipe. Measurement of vertical depth shall be made from the invert of the sewer pipe and shall be in zone classification as follows:
 - From: 0 feet to 10 feet
 - From: 10 feet to 12 feet
 - From: 12 feet to 14 feet
 - Etc. in 2 foot intervals
 4. Unless otherwise specified, the depth of cut will be from the centerline profile taken before work by the contractor begins. In most cases it will be from the existing grade shown on the plans.
- B. Manholes 0 – 8'
1. Basis of Measurement: Each
 2. Basis of Payment: According to the unit price as stated on the bid form. Manholes of each design designation will be measured by number of each constructed complete-in-place, including the base, manhole sections gaskets, external joint wrap, II barriers, rings and

castings as required, but excluding any excess depth greater than 8.0 feet measured from top of manhole cover to invert elevation of lowest pipe.

- C. Excess Manhole Depth
 - 1. Basis of Measurement: Linear Feet
 - 2. Basis of Payment: According to the unit price as stated on the bid form. Excess manhole depth of each design designation will be measured by the linear foot difference in depth between the 8.0 feet allowed as standard and the actual increased depth as constructed.
- D. Manhole Drop Sections
 - 1. Basis of Measurement: Linear Feet
 - 2. Basis of Payment: According to the unit price as stated on the bid form. The unit price per foot shall be compensation in full for a complete structure as shown on the detail drawings. Measurement for payment shall be from the lowest invert at the manhole to the invert of the incoming pipe for which the drop is provided.
- E. Service Connection
 - 1. Basis of Measurement: Each
 - 2. Basis of Payment: According to the unit price as stated on the bid form. Includes any fittings as specified.
- F. Service Pipe
 - 1. Basis of Measurement: Linear Feet
 - 2. Basis of Payment: According to the unit price as stated on the bid form. Service pipe of each design will be measured separately by length in linear feet, horizontally along the line of installation, between the service end and the point of juncture with the main pipe connection fitting. Price shall include furnishing and installing the green #10 tracer wire installed per the detail. It shall also include granular bedding required by the pipe bedding detail.
- G. Jacking Operations
 - 1. Basis of Measurement: Linear Feet (in place)
 - 2. Basis of Payment: According to the unit price as stated in the bid form. Unless otherwise specified, payment for jacking operations shall be as follows:
 - a. Measurement for payment for furnishing and installing steel casing pipe will be made horizontally from end to end of the casing installed. Payment for carrier pipe to be threaded through the casing will be made separately at the corresponding mainline or building service unit bid price. The unit bid price for the steel casing pipe shall include all labor, equipment and materials necessary to install the casing pipe complete as specified.
 - b. If the carrier pipe is jacked, tunneled or augured directly into place without the use of a steel casing pipe, the unit bid price for the pipe so installed shall include all labor, equipment and materials necessary to install the pipe complete as specified. **Only carrier pipe approved for jacking, tunneling or auguring shall be used.** Depth zones will not be a factor in payment. Measurement for payment will be made horizontally from end of the jacket, tunneled or augured pipe installed.
 - c. The Contractor shall pay all charges for bonds, permits and or inspection fees required in connection with jacking operations or other special crossing at no additional compensation.
- H. Directional Boring

1. Basis of Measurement: Linear Feet (in place)
 2. Basis of Payment: According to the unit price as stated on the bid form. No additions or deductions will be made for sweeps in either the vertical or horizontal direction to complete the installation. Price and payment will be full compensation for all work specified including furnishing and installing pipe or conduit, from plan point of beginning to plan point of ending at plan depth, removal of excavated materials and spoils, removal and disposal of drilling fluids, backfilling, and complete restoration of the site. Bundled product in a single bore will be paid for as a single bore based on the required drill bit head or back reamer head size. Separate payment shall not be made for individual products in a bundle. The installation and attachment of tracking conductors (wire or tape) will be included in the cost of the bore and will not be paid for separately. No payment will be made for failed bore paths, injection of flowable fill, products taken out of service or incomplete installations. No payment will be made for directional boring until a Bore Path Report has been delivered to the Engineer.
- I. Sheeting And Bracing:
1. Basis of Measurement: (MFB) units of thousand board feet in place.
 2. Basis of Payment: According to the unit price as stated on the bid form. Payment will be made only for that portion of sheeting or bracing which is ordered to be left in place by the Engineer except that payment will be made for the upper four (4) feet of "Cut-off" section of the sheeting.
- J. Piling:
1. Basis of Measurement: Linear Foot
 2. Basis of Payment: According to the unit price as stated on the bid form. Pile bents (including test piles) shall be paid for at the Contract unit price for a bent in place with the number of piles specified or shown on the detail drawings assuming piles to be 20 feet long and shall be complete with caps, cradles, and accessories required. The caps and cradles shall be included as part of the 20 foot minimum length. Payment will not be made for piling over the cut-off line for piling over 20 feet long.
- Unless otherwise specified, there will be no additional compensation for piling delivered only.
- K. Televising Sewer Lines:
1. Basis of Measurement: Linear Foot
 2. Basis of Payment: According to the unit price as stated on the bid form. Initial televising of the sewer lines shall be paid for by the lineal foot. Any re-televising required for verification of corrective work will not be paid for. All other testing required by these specifications shall be considered incidental to project.
- L. Adjust Casting
1. Basis of Measurement: Each (regardless of type)
 2. Basis of Payment: According to the unit price as stated on the bid form. If adjusting includes replacing all adjustment rings, providing 6" adjusting ring if structure will have 4 or 5 rings and 12" adjusting ring if there will be 6 or more rings. Includes adjusting casting to appropriate base course elevation and then to appropriate finished elevation. Adjustment to finished elevation shall be performed using

steel risers for extensions of manholes as outlined. No payment will be made for additional adjustments. Use two ring minimum and 12" maximum rings when setting castings.

- M. Install I/I Barriers on Existing Structures:
 - 1. Basis of Measurement: Each
 - 2. Basis of Payment: According to the unit price as stated on the bid form. Includes all materials and labor to install barriers to appropriate elevation for all sanitary manholes.

02990.4-02200 WATERMAIN CONSTRUCTION

- A. (PVC), (HDPE), AND (DIP) PIPE
 - 1. Basis of Measurement: Linear Foot
 - 2. Basis of Payment: According to the unit price as stated on the bid form.
 - 3. Payment will be made at the contract unit price per lineal foot for each diameter and type of pipe furnished, which shall include the cost of furnishing the pipe, rubber gaskets joints, tracer wire, and other materials and of delivering, handling, laying, trenching, backfilling, compacting, testing, disinfection and inspection and all material or work necessary to install the pipe complete in place at the depth specified. Granular or rock bedding shall be considered incidental to the pipe installation unless noted otherwise in the contract documents.
- B. Ductile Iron Pipe Fittings
 - 1. Basis of Payment: Incidental to the watermain
- C. Hydrants
 - 1. Basis of Measurement: Each
 - 2. Basis of Payment: According to the unit price as stated on the bid form. Includes tee, 6" lead, 6" G.V. & box, and all other components shown on detail W-2.
- D. Hydrant Extensions
 - 1. Basis of Measurement: Lineal foot
 - 2. Basis of Payment: According to the unit price as stated on the bid form. Payment for hydrant extensions will be made at the contract unit price per lineal foot of hydrant extension installed to include, but not limited to, labor, equipment and all necessary materials.
- E. Gate Valves And Boxes
 - 1. Basis of Measurement: Each
 - 2. Basis of Payment: According to the unit price as stated on the bid form.
 - 3. Gate valves and boxes including extensions will be paid for at the contract unit price bid for each valve size and box furnished and installed complete as shown in the details.
- F. Water Services
 - 1. Basis of Measurement: Each
 - 2. Basis of Payment: According to the unit price as stated on the bid form.
 - 3. Water service pipe will be paid for at the Contract price per lineal foot for each diameter of pipe furnished, measured horizontally from the centerline of the mainline pipe to the centerline of the curb box. It shall include the service saddle, corporation stop, curb stop, bedding and blue colored tracer wire.
- G. Jacking Operations
 - 1. Basis of Measurement: Linear Feet (in place)

2. Basis of Payment: According to the unit price as stated in the bid form. Unless otherwise specified, payment for jacking operations shall be as follows:
 - a. Measurement for payment for furnishing and installing steel casing pipe will be made horizontally from end to end of the casing installed. Payment for carrier pipe to be threaded through the casing will be made separately at the corresponding mainline or building service unit bid price. The unit bid price for the steel casing pipe shall include all labor, equipment and materials necessary to install the casing pipe complete as specified.
 - b. If the carrier pipe is jacked, tunneled or augured directly into place without the use of a steel casing pipe, the unit bid price for the pipe so installed shall include all labor, equipment and materials necessary to install the pipe complete as specified. **Only carrier pipe approved for jacking, tunneling or auguring shall be used.** Depth zones will not be a factor in payment. Measurement for payment will be made horizontally from end of the jacket, tunneled or augured pipe installed.
 - c. The Contractor shall pay all charges for bonds, permits and or inspection fees required in connection with jacking operations or other special crossing at no additional compensation.
- H. Directional Boring
 1. Basis of Measurement: Linear Feet (in place)
 2. Basis of Payment: According to the unit price as stated on the bid form. No additions or deductions will be made for sweeps in either the vertical or horizontal direction to complete the installation. Price and payment will be full compensation for all work specified including furnishing and installing pipe or conduit, from plan point of beginning to plan point of ending at plan depth, removal of excavated materials and spoils, removal and disposal of drilling fluids, backfilling, and complete restoration of the site. Bundled product in a single bore will be paid for as a single bore based on the required drill bit head or back reamer head size. Separate payment shall not be made for individual products in a bundle. The installation and attachment of tracking conductors (wire or tape) will be included in the cost of the bore and will not be paid for separately. No payment will be made for failed bore paths, injection of flowable fill, products taken out of service or incomplete installations. No payment will be made for directional boring until a Bore Path Report has been delivered to the Engineer.
- I. Sheeting And Bracing
 1. Basis of Measurement: (MFB) units of thousand board feet in place.
 2. Basis of Payment: According to the unit price as stated on the bid form. Payment will be made only for that portion of sheeting or bracing which is ordered to be left in place by the Engineer except that payment will be made for the upper four (4) feet of "Cut-off" section of the sheeting.
- J. Piling:
 3. Basis of Measurement: Linear Foot
 4. Basis of Payment: According to the unit price as stated on the bid form. Pile bents (including test piles) shall be paid for at the Contract unit price for a bent in place with the number of piles specified or shown on the detail drawings assuming piles to be 20 feet long and

shall be complete with caps, cradles, and accessories required. The caps and cradles shall be included as part of the 20 foot minimum length. Payment will not be made for piling over the cut-off line for piling over 20 feet long.

Unless otherwise specified, there will be no additional compensation for piling delivered only.

- K. Testing
All watermain testing required by these specifications shall be considered incidental to project unless allowed by the special conditions or through the Bid Form.
- L. Repair Damaged Sprinkler Systems
 - 1. Basis of Measurement: Each
 - 2. Basis of Payment: According to the unit price as stated on the bid form. Payment for salvage and install sprinkler heads and repair of sprinkler lines will be made for the entire project area as a lump sum unit or as called out by the special conditions or through the Bid Form.
- M. Remove And Replace Watermain Bolts
 - 1. Basis of Measurement: Each Unit
 - 2. Basis of Payment: According to the unit price as stated on the bid form. Watermain bolt replacement will be paid for at the contract unit price bid for each unit. Payment of each unit will include all labor, equipment and materials needed to complete the task.
- N. Remove And Replace Curb Stop W/Stand Pipe
 - 1. Basis of Measurement: Each
 - 2. Basis of Payment: According to the unit price as stated on the bid form. Includes all labor, equipment and materials necessary to remove and install a new curb stop and stand piping including removing, providing, and installing curb stop, stand pipe, fittings, connect to the existing water service from the building, and other appurtenances from water service to finished grade.
- O. Connect To Existing Watermain
 - 1. Basis of Measurement: Each
 - 2. Basis of Payment: According to the unit price as stated on the bid form. Will include all labor, equipment and materials needed to complete the task.
- P. Adjust Gate Valve Box
 - 1. Basis of Measurement: Each
 - 2. Basis of Payment: According to the unit price as stated on the bid form. Payment of each unit will include all labor, equipment and materials needed to complete the task. Payment will cover all required adjustments for each structure throughout the course of the project (onetime payment for each structure).
- Q. Alter Water Service
 - 1. Basis of Measurement: Each
 - 2. Basis of Payment: According to the unit price as stated on the bid form. Includes all labor, equipment and materials necessary to alter the service.

02990.4-02300 STORM SEWER CONSTRUCTION

- A. Storm Sewer Main Line Pipe
 - 1. Basis of Measurement: Lineal Foot

2. Basis of Payment: According to the unit price as stated on the bid form. All measurements of pipe length shall be from center of manhole to center of manhole or fitting, along the axis of the pipe for each diameter and type of pipe. Measurement of depth (vertical) shall be made from the invert of the storm sewer pipe and shall be in pipe classifications.

Payment made per lineal foot, pipe size and type, in place as measured above shall include the cost of furnishing the pipe, joint materials, gaskets and all other materials and of delivering, handling, placing, backfilling, compacting, testing and all equipment or work necessary to install the pipe complete in place at the depth specified.

Connections made to any existing manholes or catch basins shall be considered incidental to the project and there will be no additional compensation. Maintaining drainage during construction is incidental to pipe installation.

B. Manholes And Catch Basins

1. Basis of Measurement: Lineal Foot
2. Basis of Payment: According to the unit price as stated on the bid form. Payment for manholes and catch basins shall be at the unit price per each type and size, for furnishing and installing a complete structure. The unit price per structure shall also include the manhole base, cover slab, frame, rings, cover (casting), gaskets and steps in place.

C. Aprons

1. Basis of Measurement: Each
2. Basis of Payment: According to the unit price as stated on the bid form. Payment for aprons shall be by each type and size installed and shall be for complete unit with trash guard if required.

D. RIP-RAP

1. Basis of Measurement: Ton
2. Basis of Payment: According to the unit price as stated on the bid form. Payment for rip-rap shall be by the ton placed and include the geotextile fabric installed under the rip-rap. The assumed cubic yard to ton conversion shall be (1cy = 1.4 ton), for reference when using [Detail ST-4](#) in the storm sewer specifications.

E. Drain Tile & P.E. Yard Drains

1. Basis of Measurement: Lineal Foot (in place) for pipe and EACH for yard drains and connections to storm sewer system.
2. Basis of Payment: According to the unit price as stated on the bid form.
3. Drain tiles for both street and yards shall be measured by lineal foot for each size and type, along the pipe centerline, including fittings, plugs and connections. Terminal points of measurement will be as follows:
 - Pipe end at free outlets
 - Junction point with in place pipe
 - Center of structure

Fine filter aggregate used for yard tile lines shall be considered incidental to the installation. Measure connections to drainage structure as a unit including all materials and labor. Measure connections of existing discharge lines to yard drains as a unit

including all materials and labor. All associated work items shall be considered incidental.

- F. Reconstruct Manhole/Catch Basin
 - 1. Basis of Measurement: Linear Feet (in place)
 - 2. Basis of Payment: According to the unit price as stated on the bid form.
 - 3. Measure by height in linear feet from the bottom of the reconstructed portion to the top of the casting. Includes removing existing manhole or catch basin, rebuilding the structure, backfilling, and reinstalling the casting. Includes replacing all rings and adjusting casting to appropriate finished elevation. Payment shall be by the linear foot.
- G. Repair Manhole/Catch Basin
 - 1. Basis of Measurement: Linear Feet (in place)
 - 2. Basis of Payment: According to the unit price as stated on the bid form.
 - 3. Measure by height in linear feet. Includes repairing in place rings, joints, pipe connections and inverts with mortar. Payment shall be by the linear foot.
- H. Adjust Casting
 - 1. Basis of Measurement: Linear Feet (in place)
 - 2. Basis of Payment: According to the unit price as stated on the bid form.
 - 3. Measure as an individual unit regardless of type. If adjusting includes replacing all adjustment rings, providing 6" adjusting ring if structure will have 4 or 5 rings and 12" adjusting ring if there will be 6 or more rings. Includes adjusting casting to appropriate base course elevation and then to appropriate finished elevation. Adjustment to finished elevation shall be performed using steel risers for extensions of manholes as outlined. No payment will be made for additional adjustments. Use two ring minimum and 12" maximum rings when setting castings.

02990.4-02400 STREET CONSTRUCTION

- A. Subgrade Preparation
 - Subgrade preparation is incidental work with no direct compensation unless it is addressed in the special provisions of the Bid Form.
- B. Geotextile Fabric
 - 1. Basis of Measurement: Square Yards
 - 2. Basis of Payment: According to the unit price as stated on the bid form. Measure by square yards of surface area measured by the ENGINEER. No measurement or payment for joint overlap.
- C. Select Granular (Sand) For Roadway Base
 - 1. Basis of Measurement: Cubic Yard
 - 2. Basis of Payment: According to the unit price as stated on the bid form. All associated work items shall be considered incidental.
- D. Aggregate Base
 - 1. Basis of Measurement: Cubic Yard
 - 2. Basis of Payment: According to the unit price as stated on the bid form. All associated work items shall be considered incidental.
- E. Install Concrete Curb
 - 1. Basis of Measurement: Linear Foot

2. Basis of Payment: According to the unit price as stated on the bid form.
 3. Concrete curb and gutter shall be paid for at the Contract unit price per lineal foot measured along the face of the curb at the gutter line. Payment shall be compensation in full for all costs incidental to construction, including but not limited to excavation not included in the roadway excavation quantities, granular backfill when required, expansion fillers and application of curing compound. No additional compensation will be allowed for curb which is curved or for driveway openings which are constructed. Curved curb and driveway openings will be paid for at the concrete curb and gutter basis.
- F. Remove Concrete Curb
1. Basis of Measurement: Lineal Foot
 2. Basis of Payment: According to the unit price as stated on the Bid Form). Includes the removal and disposal of the curb and any traffic control specifically required for this task.
- G. Concrete Sidewalks & Medians
1. Basis of Measurement: Square Foot or Yard
 2. Basis of Payment: According to the unit price as stated on the bid form. This shall be compensation in full for all costs incidental to construction, including but not limited to excavation not included in roadway excavation quantities, granular base when required, expansion fillers and application of curing compound. Concrete sidewalk shall be paid on a square foot basis of exposed surface area at sidewalk prices with all forming required being considered incidental to the project. All associated work items including metal reinforcement shall be considered incidental.
- H. Concrete Driveways
1. Basis of Measurement: Square Yards
 2. Basis of Payment: According to the unit price as stated on the bid form.
 3. Measure and payment of driveway pavement by area in square yards. Includes excavation of unsuitable material as necessary to support driveway. Granular and aggregate materials shall be measured as Select Granular Borrow and Driveway Base, Aggregate Class 7. Removal of existing concrete driveway pavement includes saw cutting, removal and disposal.
- I. Concrete Pedestrian Ramps With Truncated Domes
1. Basis of Measurement: Each
 2. Basis of Payment: According to the unit price as stated on the bid form.
 3. Measure each pedestrian ramp as a separate item. Includes excavation of unsuitable material as necessary to support the pedestrian ramp. And includes all necessary work and materials to properly construct pedestrian ramps as per the detail in the plans. Aggregate material for pedestrian ramp base will be measured as Aggregate Base, Class 7 and be paid by the cubic yard.
- J. Removal of concrete flat work
1. Basis of Measurement: Square Yard
 2. Basis of Payment: According to the unit price as stated on the bid form.

3. This item includes the removal of sidewalks, pedestrian ramps, medians and driveways.
- K. Bituminous Pavement
1. Basis of Measurement: Square Yard
 2. Basis of Payment: According to the unit price as stated on the bid form. All associated work items shall be considered incidental.
- L. Tack Coat
1. Basis of Measurement: Gallons @ 60°F
 2. Basis of Payment: According to the unit price as stated on the bid form. All associated work items shall be considered incidental.
- M. Reflectorized Pavement Markings
1. Bases of Measurement method is as follows:
 - a. Measure 4" Solid White Line- paint by linear foot.
 - b. Pavement Messages Left Arrow, Right Arrow, and Handicap Parking shall be measured by each.
 - c. Zebra Crosswalk White- Painted by linear foot of length.
 - d. All to be measured once the lines have been painted.
 2. Payment for pavement markings and messages shall be at the contract unit price as listed on the Bid Form.
All associated work items shall be considered incidental, including the following:
 - a. Preparing the surface.
 - b. Controlling and protecting traffic.
 - c. Maintaining the work through the duration of the project.
 - d. Removing conflicting pavement markings and messages.
- N. Traffic Signs And Devices
- a. Basis of Measurement: Each
 - b. Basis of Payment: According to the unit price as stated on the bid form.
- O. Test Rolling
- a. Basis of Measurement: Linear Foot of Road Center Line.
 - b. Payment for acceptable quantities of test rolling shall be at the Contract Unit Price as listed on the Bid Form. If not listed than it will be considered incidental to the roadway construction. All associated work items shall be considered incidental. Measure by length in road stations of 100'. Measure along the roadway centerline. Measure divided roadways separately.
- P. Application of Calcium Chloride
- a. Basis of Measurement: Gallon Measure by volume in gallons at 60 degrees F. Convert weight to gallons based on 11.60 pounds per gallon for a 38 percent concentration.
 - b. Payment for calcium chloride shall be at the contract unit price as listed on the Bid Form. All associated work items shall be considered incidental.

02994-02410 BIT. DRIVEWAY & TRAIL PLACEMENT

- A. Basis of Measurement:
1. Install Bituminous Patching Mixture:
 - a. Measure by weight of mixture acceptably placed in tons including bituminous material.
 - b. Includes saw cutting, removal and disposal of existing pavement. No compensation will be given for the saw cut of any pavement.

- c. Includes measurement for bituminous driveway replacement and any existing bituminous trails.
- 2. Install Bituminous Trail and Driveway
 - a. Measure by Square Yards of surface area.
 - b. Includes saw cutting, removal and disposal of existing pavement as necessary.
- B. Basis of Payment:
 - 1. Payment for acceptable quantities of base reconditioning items shall be at the Contract Unit Price as listed on the Bid Form. All associated work items will be considered incidental.
 - 2. Removal of base or subgrade is incidental to driveway or trail replacement. Aggregate material under driveways and trails will be paid as Driveway Base, Aggregate Class 5 (CV).

02994-02420 POROUS BITUMINOUS PAVEMENT

- A. Basis of Measurement: Square Yard
- B. Basis of Payment: According to the unit price as stated on the bid form.
 - 1. Payment for acceptably placed quantities of 12" Reservoir Aggregate, 2" Choker Aggregate, and Pervious Pavement shall be at the Contract Unit Price as listed on the Bid Form. All associated work items shall be considered incidental.
 - 2. Contractor to install 100 feet of 4" conduit at the bottom of the sub-cut as directed by Engineer. (incidental)

02994-02430 LOOP DETECTORS

- A. Method of Measurement:
 - 1. Loop Detector: Each
Includes removing existing loop detectors and splices as part of street reconstruction, and furnishing and installing new loop detectors and splices.
- B. Basis of Payment:
Payment for acceptable quantities of loop detectors shall be at the Contract Unit Price as listed on the Bid Form. All associated work items shall be considered incidental.

02994-02900 TURF ESTABLISHMENT

- A. Method of Measurement:
 - 1. Sodding:
Measure by in place area sodded in square yards. No adjustments will be made for sod waste or trimmings.
 - 2. A minimum of 4" of topsoil placement is incidental to Turf Establishment.
 - 3. All grading on yards will be incidental to Turf Establishment.
 - 4. Seeding:
 - a. Measure by area seeded in acres and seed mix type according to the unit price in Bid Form.
 - b. Mulching, disk anchoring are incidental to seeding.
 - 5. Commercial Fertilizer Analysis 5-15-10
 - a. Measure by pounds placed.
 - 6. MNDOT Type II Compost with Seed:
 - a. Basis of Measurement: By the square yard as measured by ENGINEER.
 - 7. Erosion Control Blanket

a. Basis of Measurement: By the square yard as measured by ENGINEER

B. Basis of Payment:

1. Payment for acceptable quantities of turf establishment shall be at the Contract Unit Prices as listed on the Bid Form. All associated work items shall be considered incidental.
2. Payment for turf establishment will be based on the following schedule:

ITEM	UNIT
Sodding, Type Lawn & Boulevard	Square Yard
Seeding	Acre
Wood Fiber Blanket	Square Yard
Commercial Fertilizer Analysis 5-15-10	Pound
Hydro Seeding	Square Yard

02994-02905 RAIN GARDENS

A. Method of Measurement: Each

B. Basis of Payment: Payment for acceptable quantities of rain gardens shall be at the Contract Unit Prices as listed on the Bid Form. All associated work items not otherwise compensated shall be considered incidental.

Payment for rain gardens includes all materials and labor necessary including excavation, 70/15/15 soil/black dirt/sandy soil amendment, mulch, edging, draitile, draitile bedding, draitile cleanouts, curb cuts and plant materials.

1. Substantial completion (all work except plant installation) for each rain garden will be 14 calendar days after the construction begins for each rain garden.

02994-02910 PLANT INSTALLATION

A. Method of Measurement: EACH

1. Transplanting Trees. Measure by EACH tree acceptably transplanted.
2. Furnishing and Planting Trees and Shrubs. Measure as a unit for each size and variety acceptably planted according to the unit price in the Bid Form.

B. Basis of payment:

1. Payment for acceptable quantities of furnishing and planting and transplanting trees and shrubs shall be at the contract unit price as listed on the Bid Form. All associated work items not otherwise compensated shall be considered incidental.
2. Protecting existing trees and shrubs, including all necessary materials and labor, shall be incidental.
3. Payment for acceptable quantities of furnished and planted and transplanted trees and shrubs includes:
4. Furnishing and planting the materials as specified.
5. Furnishing and installing planting soil, mulch, material, protective materials and other specified materials.
6. Plant maintenance and replacement until acceptable.
7. Disposal of all excess excavated material.
8. All costs of plant establishment work shall be at the Contractor's expense, including the costs of any replacement materials required.

02994-02915 RETAINING WALLS

- A. Method of Measurement: Square Feet
Measure the total wall face area including any areas below finished grade.
- B. Basis of Payment:
 - 1. Payment for retaining walls includes all materials and labor necessary including excavation, granular base and backfill and structural reinforcement.
 - 2. Payment for acceptable quantities of retaining walls shall be at the Contract Unit Prices as listed on the Bid Form. All associated work items including surface sealing shall be considered incidental.
 - 3. Drintile installed with concrete block retaining wall shall be paid as 4" PE Street Drintile w/sock on a linear foot basis.
 - 4. CONTRACTOR shall notify ENGINEER upon completion of wall, prior to backfilling, for inspection and measurement.

MERGED ITEMS

The cost of all materials and labor required to complete this project as specified and shown on the plans, but not specifically included as a pay item, shall be merged with the various unit prices bid.

END OF SECTION

Geotechnical Evaluation Report

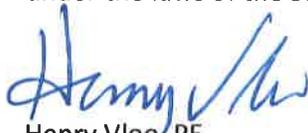
Highway 55 Frontage Road Reconstruction
Between South Shore Drive and West Medicine Lake Drive
Plymouth, Minnesota

Prepared for

City of Plymouth

Professional Certification:

I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.



Henry Vloo, PE

Associate Principal – Senior Engineer

License Number: 21140

January 10, 2018



January 10, 2018

Project B1712827

Mr. Mike Payne
City of Plymouth
3400 Plymouth Boulevard
Plymouth, MN 55446

Re: Geotechnical Evaluation
Highway 55 Frontage Road Reconstruction
Between South Shore Drive and West Medicine Lake Drive
Plymouth, Minnesota

Dear Mr. Payne:

We are pleased to present this Geotechnical Evaluation Report for the reconstruction of the north frontage road along Highway 55 between South Shore Drive and West Medicine Lake Drive in Plymouth, Minnesota.

Thank you for making Braun Intertec your geotechnical consultant for this project. If you have questions about this report, or if there are other services that we can provide in support of our work to date, please contact Henry Vloo at 952.995.2234 (hvloo@braunintertec.com) or Ray Huber at 952.995.2260 (rhuber@braunintertec.com).

Sincerely,

BRAUN INTERTEC CORPORATION



Henry Vloo, PE
Associate Principal – Senior Engineer



Ray A. Huber, PE
Vice President – Principal Engineer

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Appendix

Soil Boring Location Sketch

Log of Boring Sheet ST-101

Log of Previous Borings ST-10 through ST-12

Descriptive Terminology of Soil

A. Introduction

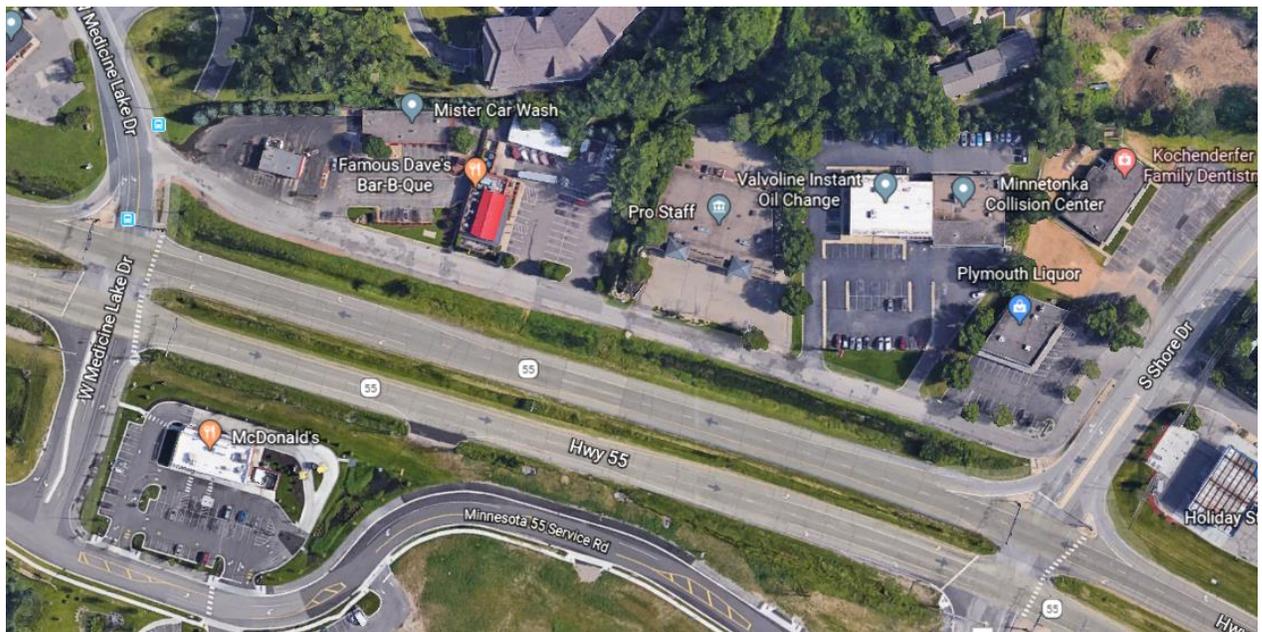
A.1. Project Description

This Geotechnical Evaluation Report addresses the proposed design and reconstruction of the frontage road along the north side of Highway 55 between South Shore Drive and West Medicine Lake Drive in Plymouth, Minnesota. The road will include a new 9-ton street section. A portion of the existing sanitary sewer line will also be replaced. Because of potential poor soils on this site, the replacement pipe may need to be supported by an alternative foundation system, such as helical screw piles. A number of new shallow storm sewer lines will also be built under the road; however, there is concern of differential movements that could occur around these shallow pipes.

A.2. Site Conditions and History

The existing frontage road is shown in aerial Photograph 1 below.

Photograph 1. Aerial Photograph of the Site



Photograph provided by Google Earth.

A.3. Purpose

The purpose of our geotechnical evaluation will be to characterize subsurface geologic conditions at selected exploration locations and evaluate their impact on the design and construction of the frontage road and a portion of the sanitary sewer line.

A.4. Background Information and Reference Documents

We reviewed the following information:

- Available public aerial photographs showing the existing site conditions.
- Previous geotechnical report prepared by Braun Intertec and dated January 29, 2013.
- Communications with Mr. Mike Payne regarding the details regarding reconstruction.

We have described our understanding of the proposed construction and site to the extent others reported it to us. Depending on the extent of available information, we may have made assumptions based on our experience with similar projects. If we have not correctly recorded or interpreted the project details, the project team should notify us. New or changed information could require additional evaluation, analyses and/or recommendations.

A.5. Scope of Services

We performed our scope of services for the project in accordance with our Proposal Mr. Mike Payne with the City of Plymouth, dated December 14, 2017, and authorized on December 15, 2017. The following list describes the geotechnical tasks completed in accordance with our authorized scope of services.

- Reviewing the background information and reference documents previously cited.
- Staking and clearing the exploration location of underground utilities. Braun Intertec selected and staked the new exploration location. We acquired the surface elevation and location with GPS technology using the State of Minnesota's permanent GPS base station network. The Soil Boring Location Sketch included in the Appendix shows the approximate location of the current and previous borings.

- Performing one standard penetration test (SPT) borings, denoted as ST-101, to a nominal depth of 50 feet below grade.
- Performing laboratory testing on select samples to aid in soil classification and engineering analysis.
- Preparing this report containing a boring location sketch, logs of soil borings, a summary of the soils encountered, results of laboratory tests, and recommendations for pavement subgrade preparation and the design of underground utilities and pavements.

As we were completing our soil boring to the 45-foot depth, groundwater under pressure caused the hollow stem auger to fill with waterbearing sand. We determined that enough soil information was obtained and the boring was terminated at this depth.

Our scope of services did not include environmental services or testing, and we did not train the personnel performing this evaluation to provide environmental services or testing. We can provide these services or testing at your request.

B. Results

B.1. Geologic Overview

We based the geologic origins used in this report on the soil types, in-situ and laboratory testing, and available common knowledge of the geological history of the site. Because of the complex depositional history, geologic origins can be difficult to ascertain. We did not perform a detailed investigation of the geologic history for the site.

B.2. Previous Geotechnical Information

Braun Intertec performed soil borings on this frontage road in January of 2013. The previous soil borings encountered a pavement section of 4 to 4 1/2 inches of bituminous over 6 to 7 1/2 inches of aggregate base followed by mixed fill soils to depths of about 4 to 18 feet. The fill soils consisted of a mixture of clayey sand, silty sand and poorly graded sand with silt. Below the fill soils, these borings encountered swamp deposited or alluvial soils to the termination depths of the borings. These soils included organic silt in Boring ST-11 and a mixture of lean clay, silty clay and sandy silt in Boring ST-12.

The penetration resistances in the fill soils ranged from 4 to 44 blows per foot (BPF) indicating that most of the fill soils were compacted when placed. The penetration resistances in the alluvial clay soils ranged from 11 to 17 BPF, corresponding to consistencies of rather stiff to very stiff. The penetration resistance in the layer of sandy silt was 16 BPF, corresponding to a relative density of medium dense. The penetration resistance in the organic silt was 6 BPF, corresponding to a relative density of loose.

B.3. Current Boring Results

The soils encountered in the current Soil Boring ST-101 consisted of a pavement section of about 5 inches of bituminous over 4 inches of aggregate base followed by fill soils to a depth of about 12 feet. The fill soils were classified as poorly graded sand with silt. Below the fill soils, the boring encountered a layer of alluvial poorly graded sand to about the 15-foot depth followed by a layer of swamp deposited organic silt to about the 18-foot depth. Below this depth, the boring encountered glacially deposited poorly graded sand to the termination depth of about 45 feet.

The penetration resistances in the fill soils ranged from 2 to 23 BPF, with the lowest blow counts in waterbearing sands. The penetration resistance in the alluvial poorly graded sand was 2 BPF, corresponding to a relative density of very loose. The penetration resistance in the layer of organic silt was also 2 BPF, again corresponding to a relative density of very loose. The penetration resistances in the glacial poorly graded sand at depth ranged from 5 to 15 BPF corresponding to relative densities of loose to medium dense.

B.4. Groundwater

We observed groundwater at a depth of about 9 1/2 feet while advancing our boring. After the boring had been completed, water was observed at a depth of about 7 1/2 feet, or an approximate elevation of 889. Previous Soil Borings ST-11 and ST-12 encountered water at about the 10-foot depth when completed in 2013. Project planning should anticipate seasonal and annual fluctuations of groundwater.

B.5. Laboratory Test Results

The boring logs show the results of laboratory testing we performed, next to the tested sample depth. The laboratory tests were completed in accordance with applicable ASTM (American Society of Testing and Materials).

The moisture content (ASTM D 2216) of the selected samples varied from approximately 14 to 20 percent, indicating that the material tested was moist to wet of its probable optimum moisture content.

Our mechanical analyses, through a #200 sieve only, (ASTM C 117) indicated that the sample tested contained 10 percent silt and clay by weight, classifying this soil as poorly graded sand with silt.

An organic content test (ASTM D 2974) was completed on the layer of organic silt. The result was 3.4 percent organic material with a moisture content of 74 percent.

C. Recommendations

C.1. Design and Construction Discussion

C.1.a. Introduction

The existing frontage road is about 1,600 feet long and will be reconstructed to a 9-ton capacity. A portion of the sanitary sewer line between about stations 8+00 to 12+00 will be reconstructed because this portion of the line has a sag in it. Several shallow storm sewer pipes will also be constructed under and perpendicular to the frontage road.

C.1.b. Existing Fill

Based on the previous and current soil borings, the upper 4 to 18 feet of soils under the existing road consist of fill soils that are mostly poorly graded sand or poorly graded sand with silt with lesser amounts of silty sand or clayey sand. It appears that most of these soils will be reusable as compacted fill when reconstructing the new street. However, some of the deeper soils encountered by the borings consist of organic silt. When this material is excavated as part of the sanitary sewer reconstruction, it will not be reusable as trench backfill or as compacted fill under the pavements. If excavations extend below the groundwater levels, the sand soils at depth will be saturated. Prior to using this material as compacted trench backfill, these soils may need to be temporarily stockpiled to allow the water to drain from them.

C.1.c. Groundwater

Based on the borings, groundwater will likely be from 7 1/2 to 10 feet below the surface. Groundwater will likely not impact pavement reconstruction, or when constructing the shallow storm sewer pipes. However, water will likely be a factor when replacing the sanitary sewer line. Based on Boring ST-101, groundwater was encountered at about elevation 889 and the invert of the sanitary sewer line is near elevation 880.

C.2. Subgrade Preparation

C.2.a. Pavement Subgrade Preparation

We recommend the following steps for pavement subgrade preparation:

1. Strip unsuitable soils consisting of topsoil, organic soils, peat, vegetation, and pavements from the roadway as required.
2. Have a geotechnical representative observe the excavated subgrade to evaluate if additional subgrade improvements are necessary.
3. Slope subgrade soils to areas of sand or drain tile to allow the removal of accumulating water.
4. Scarify, moisture condition and surface compact the subgrade to meet the compaction requirements for the project.
5. Proofroll the pavement subgrades as described in Section C.2.c.

C.2.b. Pavement Subgrade Proofroll

After preparing the subgrade as described above and prior to the placement of the aggregate base, we recommend proofrolling the subgrade soils with a fully loaded tandem-axle truck. We also recommend having a geotechnical representative observe the proofroll. Areas that fail the proofroll likely indicate soft or weak areas that will require additional soil correction work to support pavements.

The contractor should correct areas that display excessive yielding or rutting during the proofroll, as determined by the geotechnical representative. Possible options for subgrade correction include moisture conditioning and re-compaction, subcutting and replacement with soil or crushed aggregate, chemical stabilization and/or geotextiles. We recommend performing a second proofroll after the aggregate base material is in place, and prior to placing bituminous pavement.

C.2.c. Engineered Fill Materials and Compaction

Table 1 below contains our recommendations for engineered fill materials.

Table 1. Engineered Fill Materials

Locations	Engineered Fill Classification	Possible Soil Type Descriptions	Gradation	Additional Requirements
Pavement and embankment fill Utility support and backfill	MnDOT select grading material	SP, SP-SM, SM, SC, CL	Varies	PI < 15 % silt < 80% OC < 5%
Below landscaped surfaces, where subsidence is not a concern	Non-structural fill	Varies	100% passing 6-inch sieve	< 10% OC

We recommend spreading engineered fill in loose lifts of approximately 12 inches thick. We recommend compacting engineered fill in accordance with MnDOT Specifications 2105 (or 2106).

Our compaction requirements are summarized in Table 2.

Table 2. Compaction Recommendations Summary

Reference	Relative Compaction, percent (ASTM D698 – Standard Proctor)	Moisture Content Variance from Optimum, percentage points	
		< 12% Passing #200 Sieve (typically SP, SP-SM)	> 12% Passing #200 Sieve (typically CL, SC, ML, SM)
Within 3 feet of pavement subgrade	100	±3	-2 to +1
More than 3 feet below pavement subgrade	95	±3	±3
Below landscaped surfaces	90	±5	±5
Below utilities	95	±3	-1 to +3

We recommend performing density tests in engineered fill to evaluate if the contractors are effectively compacting the soil and meeting project requirements.

C.3. Pavements

C.3.a. Design Sections

Our scope of services for this project did not include laboratory tests on subgrade soils to determine an R-value for pavement design. Since the soil borings indicated a mixture of sandy and clay soils beneath the existing pavements, we recommend the new pavements be designed based on the soil with the poorest drainage, which is clayey sand. We recommend pavement design assume an R-value of 12. Note the contractor may need to perform limited removal of unsuitable or less suitable soils to achieve this value. Table 3 provides recommended pavement sections, based on the soils support and traffic loads.

This design can support approximately 1.5 million 20-year ESALs according to MnPAVE-Flexible design (minimum reliability of 90 percent). Alternative designs can also be review for suitability.

Table 3. Pavement Section

Layer	Thickness (inches)	MnDOT Specification/Designation
Bituminous Wear	2 (1 lift)	SPWEB340C (2360)
Bituminous Non-wear	2 (1 lift)	SPNWB330C (2360)
Aggregate Base	12	Class 5 (3138)
Subbase	12	Select Granular (MnDOT Specification 3149.2B4)

The above pavement design is based upon a 20-year performance life at the lifetime traffic loading indicated on the MnPAVE-Flexible output. This is the amount of time before major reconstruction is anticipated. This performance life assumes maintenance such as seal coating and crack sealing is routinely performed. The actual pavement life will vary depending on variations in weather, traffic conditions (which are considerably less than the pavement capacity) and maintenance.

C.3.b. Bituminous Pavement Materials

Appropriate mix designs are critical to the performance of flexible pavements. We can provide recommendations for pavement material selection during final pavement design.

C.3.c. Subgrade Drainage

We recommend installing perforated drainpipes throughout pavement areas at low points, around catch basins, and behind curb in landscaped areas. We also recommend installing drainpipes along pavement and exterior slab edges where exterior grades promote drainage toward those edge areas. The

contractor should place drainpipes in small trenches, extended at least 8 inches below the granular subbase layer, or below the aggregate base material where no subbase is present.

C.3.d. Performance and Maintenance

We based the above pavement designs on a 20-year performance life for bituminous. This is the amount of time before we anticipate the pavement will require reconstruction. This performance life assumes routine maintenance, such as seal coating and crack sealing. The actual pavement life will vary depending on variations in weather, traffic conditions and maintenance.

It is common to place the non-wear course of bituminous and then delay placement of wear course. For this situation, we recommend evaluating if the reduced pavement section will have sufficient structure to support construction traffic.

Many conditions affect the overall performance of the exterior slabs and pavements. Some of these conditions include the environment, loading conditions and the level of ongoing maintenance. With regard to bituminous pavements in particular, it is common to have thermal cracking develop within the first few years of placement, and continue throughout the life of the pavement. We recommend developing a regular maintenance plan for filling cracks in exterior slabs and pavements to lessen the potential impacts for cold weather distress due to frost heave or warm weather distress due to wetting and softening of the subgrade.

C.4. Utilities

C.4.a. Sanitary Sewer Replacement

We anticipate the soils at typical invert elevations may not be suitable for utility support. Based on the current soil boring, a layer of organic silt is likely present several feet below the bottom of the sanitary sewer pipe, to an elevation of about 878 to 878 1/2. If construction encounters unfavorable conditions such as soft clay or organic soils at invert grades, the unsuitable soils may require some additional subcutting and replacement with sand or crushed rock to prepare a proper subgrade for pipe support.

When the trench excavations for sanitary sewer construction are being completed, we recommend that any unsuitable soil be isolated into separate stockpiles. The unsuitable material should not be used to backfill the utility trench. Some of the sand soils at depth are saturated. These soils will likely need to be stockpiled for a short time to allow the water to drain from them. After the water has drained from the sands, they can then be used to backfill the trenches.

C.4.b. Excavation Dewatering

Dewatering of high-permeability soils (e.g., sands) from within the excavation with conventional pumps has the potential to loosen the soils, due to upward flow. A well contractor should develop a dewatering plan; the design team should review this plan.

C.4.c. Corrosion Potential

A majority of the soil borings indicated the site predominantly consists of sandy soils. We consider these soils non- to slightly-corrosive to metallic conduits. If utilities extend through clay soils, we recommend bedding the utilities in sandy soil free of any clay lumps or constructing the utilities with non-corrosive materials.

C.4.d. Alternative Sanitary Sewer Support

It may be possible to support the replacement sanitary sewer line with an alternative support system, such as helical screw piles. The design and construction of this type of pipe support system is generally completed by a contractor specializing in this service. If a helical screw pile system is to be used, we recommend that an independent testing agency complete observations during the installation process.

C.4.e. Storm Sewer Crossings

A number of shallow storm sewer crossings are planned across this street. There is concern that there will be differential frost heave at the storm sewer crossings as compared to the remainder of the street. To minimize the frost heave differential, we recommend that the soils below the bottom of the storm sewer pipe be subcut a minimum of 4 feet and replaced with a non frost-susceptible soil. This soil should be graded such that less than 5 percent of the materials passes the #200 sieve and less than 50 percent passes the #40 sieve. The zone of the non frost-susceptible fill should extend down and away from the bottom of the pipe at least 1 foot horizontal to 2 feet vertical. As this trench is backfilled, the same non-frost susceptible soil should be used to backfill the sides of the pipe and extending to the top-of-pipe elevation. A less select soil can be used to backfill the remainder of the trench.

As an alternative to subcutting an extra 4 feet, 2 to 4 inches of high density insulation could be placed immediately below the pipe and extending laterally an additional 2 feet beyond the edges of the pipe. The pipe should then be backfilled to the top-of-pipe elevation with the non-frost susceptible soil as described in the previous paragraph.

D. Procedures

D.1. Penetration Test Boring

We drilled the current penetration test boring on December 27, 2017 with a truck-mounted core and auger drill equipped with hollow-stem auger. We performed the borings in general accordance with ASTM D6151 taking penetration test samples at 2 1/2- or 5-foot intervals in general accordance to ASTM D1586. We collected thin-walled tube samples in general accordance with ASTM D1587 at selected depths. The boring logs show the actual sample intervals and corresponding depths. We also collected bulk samples of auger cuttings at selected locations for laboratory testing.

We sealed penetration test boreholes meeting the Minnesota Department of Health (MDH) Environmental Borehole criteria with an MDH-approved grout. We will forward/forwarded a sealing record (or sealing records) for those boreholes to the Minnesota Department of Health Well Management Section.

D.2. Exploration Logs

D.2.a. Log of Boring Sheets

The Appendix includes Log of Boring sheets for our penetration test borings. The logs identify and describe the penetrated geologic materials, and present the results of penetration resistance and other in-situ tests performed. The logs also present the results of laboratory tests performed on penetration test samples, and groundwater measurements.

We inferred strata boundaries from changes in the penetration test samples and the auger cuttings. Because we did not perform continuous sampling, the strata boundary depths are only approximate. The boundary depths likely vary away from the boring locations, and the boundaries themselves may occur as gradual rather than abrupt transitions.

D.2.b. Geologic Origins

We assigned geologic origins to the materials shown on the logs and referenced within this report, based on: (1) a review of the background information and reference documents cited above, (2) visual classification of the various geologic material samples retrieved during the course of our subsurface exploration, (3) penetration resistance and other in-situ testing performed for the project, (4) laboratory test results, and (5) available common knowledge of the geologic processes and environments that have impacted the site and surrounding area in the past.

D.3. Material Classification and Testing

D.3.a. Visual and Manual Classification

We visually and manually classified the geologic materials encountered based on ASTM D2488. When we performed laboratory classification tests, we used the results to classify the geologic materials in accordance with ASTM D2487. The Appendix includes a chart explaining the classification system we used.

D.3.b. Laboratory Testing

The exploration logs in the Appendix note the results of the laboratory tests performed on geologic material samples. We performed the tests in general accordance with ASTM procedures.

D.4. Groundwater Measurements

The drillers checked for groundwater while advancing the penetration test boring, and again after auger withdrawal. We then filled the borehole with bentonite grout.

E. Qualifications

E.1. Variations in Subsurface Conditions

E.1.a. Material Strata

We developed our evaluation, analyses and recommendations from a limited amount of site and subsurface information. It is not standard engineering practice to retrieve material samples from exploration locations continuously with depth. Therefore, we must infer strata boundaries and thicknesses to some extent. Strata boundaries may also be gradual transitions, and project planning should expect the strata to vary in depth, elevation and thickness, away from the exploration locations.

Variations in subsurface conditions present between exploration locations may not be revealed until performing additional exploration work, or starting construction. If future activity for this project reveals any such variations, you should notify us so that we may reevaluate our recommendations. Such variations could increase construction costs, and we recommend including a contingency to accommodate them.

E.1.b. Groundwater Levels

We made groundwater measurements under the conditions reported herein and shown on the exploration logs, and interpreted in the text of this report. Note that the observation periods were relatively short, and project planning can expect groundwater levels to fluctuate in response to rainfall, flooding, irrigation, seasonal freezing and thawing, surface drainage modifications and other seasonal and annual factors.

E.2. Continuity of Professional Responsibility

E.2.a. Plan Review

We based this report on a limited amount of information, and we made a number of assumptions to help us develop our recommendations. When the project plans are completed, Braun Intertec should review the geotechnical aspects of the designs and specifications. This review will allow us to evaluate whether we anticipated the design correctly, if any design changes affect the validity of our recommendations, and if the design and specifications correctly interpret and implement our recommendations.

E.2.b. Construction Observations and Testing

We recommend retaining us to perform the required observations and testing during construction as part of the ongoing geotechnical evaluation. This will allow us to correlate the subsurface conditions exposed during construction with those encountered by the borings and provide professional continuity from the design phase to the construction phase. If we do not perform observations and testing during construction, it becomes the responsibility of others to validate the assumption made during the preparation of this report and to accept the construction-related geotechnical engineer-of-record responsibilities.

E.3. Use of Report

This report is for the exclusive use of the addressed parties. Without written approval, we assume no responsibility to other parties regarding this report. Our evaluation, analyses and recommendations may not be appropriate for other parties or projects.

E.4. Standard of Care

In performing its services, Braun Intertec used that degree of care and skill ordinarily exercised under similar circumstances by reputable members of its profession currently practicing in the same locality. No warranty, express or implied, is made.

Appendix



Drawing Information

Project No:
B1712827

Drawing No:
B1712827

Drawn By: BJB
Date Drawn: 12/21/17
Checked By: HV
Last Modified: 12/29/17

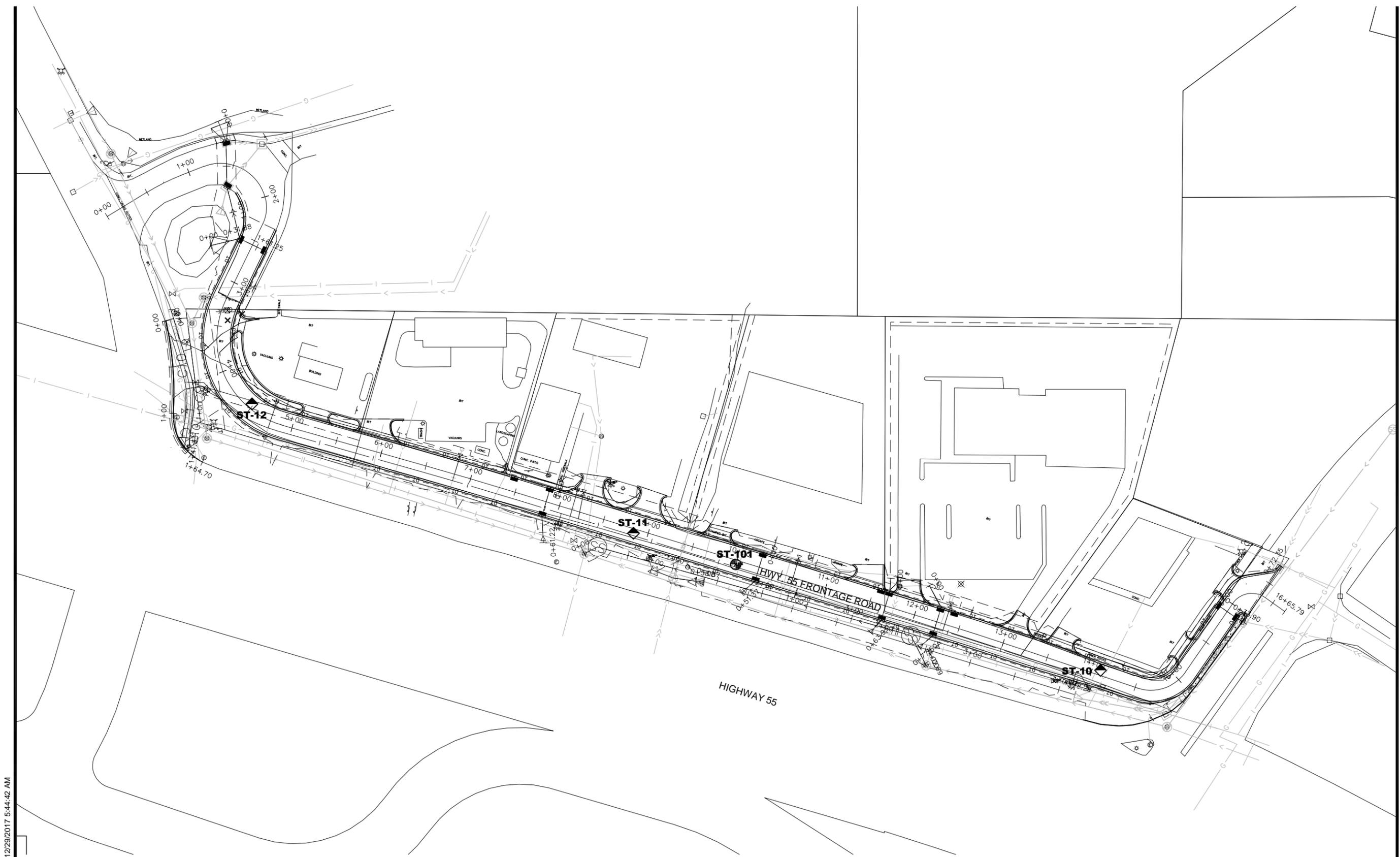
Project Information

Highway 55 Frontage
Road Reconstruction

Between South Shore
Drive and Medicine Lake
Drive

Plymouth, Minnesota

Soil Boring
Location Sketch



- DENOTES APPROXIMATE LOCATION OF STANDARD PENETRATION TEST BORING
- ◆ DENOTES APPROXIMATE LOCATION OF PREVIOUSLY COMPLETED SOIL BORING



50' 0 100'

SCALE: 1" = 100'

(See Descriptive Terminology sheet for explanation of abbreviations)

LOG OF BORING N:\GINT\PROJECTS\AX PROJECTS\2017\12827.GPJ BRAUN_V8_CURRENT.GDT 1/10/18 10:27

Braun Project B1712827 GEOTECHNICAL EVALUATION Highway 55 Frontage Road Reconstruction Between South Shore Drive and West Medicine Lake Drive Plymouth, Minnesota				BORING: ST-101 LOCATION: See attached sketch.				
DRILLER: C. McClain		METHOD: 3 1/4" HSA, Autohammer		DATE: 12/27/17		SCALE: 1" = 4'		
Elev. feet	Depth feet	Symbol	Description of Materials (Soil-ASTM D2488 or D2487, Rock-USACE EM1110-1-2908)	BPF	WL	MC %	P200 %	Tests or Notes
896.6	0.0							
895.8	0.8	PAV	5 inches of bituminous over 4 inches of aggregate base.					Benchmark: Elevations determined by gps technology.
		FILL	FILL: Poorly Graded Sand with Silt, fine- to medium-grained, trace Gravel, with lenses of Silty Sand and Clayey Sand, brown and dark brown, moist to 7 1/2 feet then waterbearing.	23				
				11				An open triangle in the water level (WL) column indicates the depth at which groundwater was observed while drilling. A solid triangle indicates the groundwater level in the boring on the date indicated. Groundwater levels fluctuate.
				6	▼	14	10	
				2	▽			
884.6	12.0	SP	POORLY GRADED SAND, fine- to medium-grained, trace Gravel, gray, waterbearing, very loose. (Alluvium)	2				
881.1	15.5	OH	ORGANIC SILT, trace shells, gray, wet. (Swamp Deposit)	2		74		
878.6	18.0	SP	POORLY GRADED SAND, fine- to coarse-grained, trace Gravel, gray, waterbearing, loose. (Glacial Outwash)	5				
				5				
868.6	28.0	SP	POORLY GRADED SAND, fine- to medium-grained, gray, waterbearing, loose to medium dense. (Glacial Outwash)	8		20	5	

(See Descriptive Terminology sheet for explanation of abbreviations)

LOG OF BORING N:\GINT\PROJECTS\AX PROJECTS\2017\12827.GPJ BRAUN_V8_CURRENT.GDT 1/10/18 10:27

Braun Project B1712827 GEOTECHNICAL EVALUATION Highway 55 Frontage Road Reconstruction Between South Shore Drive and West Medicine Lake Drive Plymouth, Minnesota					BORING: ST-101 (cont.) LOCATION: See attached sketch.				
DRILLER: C. McClain		METHOD: 3 1/4" HSA, Autohammer			DATE: 12/27/17		SCALE: 1" = 4'		
Elev. feet	Depth feet	Symbol	Description of Materials (Soil-ASTM D2488 or D2487, Rock-USACE EM1110-1-2908)	BPF	WL	MC %	P200 %	Tests or Notes	
864.6	32.0		POORLY GRADED SAND, fine- to medium-grained, gray, waterbearing, loose to medium dense. (Glacial Outwash) <i>(continued)</i>						
				15					
				11					
852.6	44.0		END OF BORING DUE TO SAND BLOW-UP. Water observed at 9 1/2 feet while drilling. Water observed at 7 1/2 feet with 39 1/2 feet of hollow-stem auger in the ground. Water observed at 7 1/2 feet immediately after withdrawal of auger. Boring immediately backfilled with bentonite grout.						

(See Descriptive Terminology sheet for explanation of abbreviations)

LOG OF BORING N:\GINT\PROJECTS\MINNEAPOLIS\2012\07277A.GPJ BRAUN_V8_CURRENT.GDT 1/30/13 09:14

Braun Project BL-12-07277A GEOTECHNICAL EVALUATION Highway 55 Frontage Road Reconstruction Between South Shore Drive and West Medicine Lake Drive Plymouth, Minnesota					BORING: ST-10 LOCATION: See attached sketch.				
DRILLER: J. Chermak		METHOD: 3 1/4" HSA, Autohammer		DATE: 1/14/13		SCALE: 1" = 4'			
Depth feet	Symbol	Description of Materials (Soil-ASTM D2488 or D2487, Rock-USACE EM1110-1-2908)	BPF	WL	MC %	P200 %	Tests or Notes		
0.0									
0.8	PAV	4 inches of Bituminous over 6 inches of Aggregate Base.							
	FILL	FILL: Silty Sand, fine- to medium-grained, trace of Gravel, brown and dark brown, frozen to moist.							
			35		6	15			
			44						
			25						
			29						
			48						
8.0		With lenses of Lean Clay at 7 feet.	36						
		END OF BORING.							
		Water not observed with 6 feet of hollow-stem auger in the ground.							
		Water not observed immediately after withdrawal of auger.							
		Boring immediately backfilled.							

(See Descriptive Terminology sheet for explanation of abbreviations)

LOG OF BORING N:\GINT\PROJECTS\MINNEAPOLIS\2012\07277A.GPJ BRAUN_V8_CURRENT.GDT 1/30/13 09:14

Braun Project BL-12-07277A GEOTECHNICAL EVALUATION Highway 55 Frontage Road Reconstruction Between South Shore Drive and West Medicine Lake Drive Plymouth, Minnesota				BORING: ST-11			
DRILLER: J. Chermak		METHOD: 3 1/4" HSA, Autohammer		DATE: 1/14/13		SCALE: 1" = 4'	
Depth feet	Symbol	Description of Materials (Soil-ASTM D2488 or D2487, Rock-USACE EM1110-1-2908)	BPF	WL	MC %	P200 %	Tests or Notes
0.0	PAV	4 1/2 inches of Bituminous over 7 1/2 inches of Aggregate Base.					
1.0	FILL	FILL: Clayey Sand, with layers of Silty Sand, dark gray and black, frozen to wet.	15		11	21	
5.0	FILL	FILL: Poorly Graded Sand with Silt, fine- to medium-grained, dark brown, moist.	13				
6.0	FILL	FILL: Clayey Sand, with layers of Silty Sand and Lean Clay, black and gray, wet.	9				
8.0	FILL	FILL: Poorly Graded Sand with Silt, fine- to medium-grained, trace of Gravel, brown and gray, waterbearing.	4				
			5	▽			An open triangle in the water level (WL) column indicates the depth at which groundwater was observed while drilling.
18.0	OH	ORGANIC SILT, trace of Shells, dark brown, wet. (Swamp Deposit)	5				
21.0		END OF BORING.	6				
		Water observed at 10 feet while drilling.					
		Water observed at 16 feet with 19 1/2 feet of hollow-stem auger in the ground.					
		Water not observed to cave-in depth of 9 1/2 feet immediately after withdrawal of auger.					
		Boring immediately backfilled.					

(See Descriptive Terminology sheet for explanation of abbreviations)

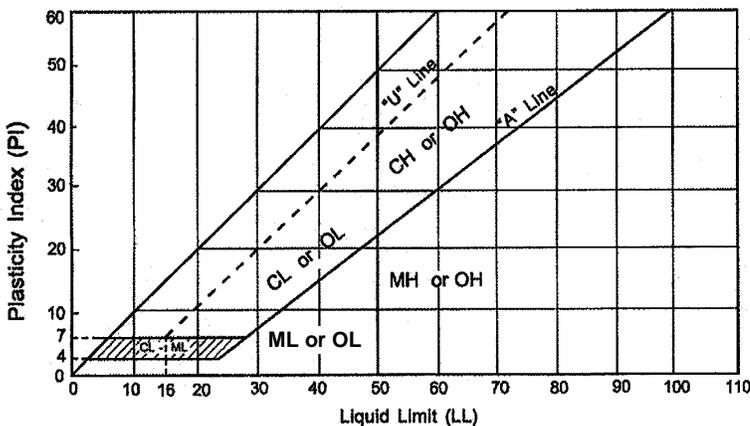
LOG OF BORING N:\GINT\PROJECTS\MINNEAPOLIS\2012\07277A.GPJ BRAUN_V8_CURRENT.GDT 1/30/13 09:14

Braun Project BL-12-07277A GEOTECHNICAL EVALUATION Highway 55 Frontage Raod Reconstruction Between South Shore Drive and West Medicine Lake Drive Plymouth, Minnesota			BORING: ST-12			
DRILLER: J. Chermak			METHOD: 3 1/4" HSA, Autohammer		DATE: 1/14/13	SCALE: 1" = 4'
Depth feet	Symbol	Description of Materials (Soil-ASTM D2488 or D2487, Rock-USACE EM1110-1-2908)	BPF	WL	MC %	Tests or Notes
0.0	PAV	4 1/2 inches of Bituminous over 7 inches of Aggregate Base.				
1.0	FILL	FILL: Poorly Graded Sand, fine- to medium-grained, trace of Gravel, light brown, frozen to moist.	21			
4.0	CL	LEAN CLAY, light brown to gray, wet, rather stiff to stiff. (Alluvium)	11 13 15		30	LL=33% PL=20% PI=13%
8.0	CL-ML	SILTY CLAY, gray, wet, rather stiff to very stiff. (Alluvium)	12 17			
13.0	ML	SANDY SILT, gray, wet, medium dense. (Alluvium)	16			
18.0	CL	LEAN CLAY, with lenses of Silty Sand and Sandy Silt, gray, wet, stiff. (Alluvium)	13			
21.0		END OF BORING. Water observed at 10 feet while drilling. Water not observed with 19 1/2 feet of hollow-stem auger in the ground. Water not observed to cave-in depth of 17 feet immediately after withdrawal of auger. Boring immediately backfilled.				



Criteria for Assigning Group Symbols and Group Names Using Laboratory Tests ^a				Soils Classification		
				Group Symbol	Group Name ^b	
Coarse-grained Soils more than 50% retained on No. 200 sieve	Gravels More than 50% of coarse fraction retained on No. 4 sieve	Clean Gravels Less than 5% fines ^e	$C_u \geq 4$ and $1 \leq C_c \leq 3$ ^c	GW	Well-graded gravel ^d	
		Gravels with Fines More than 12% fines ^e	Fines classify as ML or MH	GM	Silty gravel ^{d f g}	
			Fines classify as CL or CH	GC	Clayey gravel ^{d f g}	
		Sands 50% or more of coarse fraction passes No. 4 sieve	Clean Sands Less than 5% fines ⁱ	$C_u \geq 6$ and $1 \leq C_c \leq 3$ ^c	SW	Well-graded sand ^h
	Sands with Fines More than 12% ⁱ		Fines classify as ML or MH	SM	Silty sand ^{f g h}	
			Fines classify as CL or CH	SC	Clayey sand ^{f g h}	
	Fine-grained Soils 50% or more passed the No. 200 sieve		Silt and Clays Liquid limit less than 50	Inorganic	PI > 7 and plots on or above "A" line ^j	CL
		Organic		PI < 4 or plots below "A" line ^j	ML	Silt ^{k l m}
Liquid limit - oven dried < 0.75				OL	Organic clay ^{k l m n}	
Liquid limit - not dried < 0.75		OL		Organic silt ^{k l m o}		
Silt and clays Liquid limit 50 or more		Inorganic	PI plots on or above "A" line	CH	Fat clay ^{k l m}	
			PI plots below "A" line	MH	Elastic silt ^{k l m}	
		Organic	Liquid limit - oven dried < 0.75	OH	Organic clay ^{k l m p}	
			Liquid limit - not dried < 0.75	OH	Organic silt ^{k l m q}	
		Highly Organic Soils		Primarily organic matter, dark in color and organic odor	PT	Peat

- Based on the material passing the 3-inch (75mm) sieve.
- If field sample contained cobbles or boulders, or both, add "with cobbles or boulders or both" to group name.
- $C_u = D_{60}/D_{10}$ $C_c = (D_{30})^2 / (D_{10} \times D_{60})$
- If soil contains $\geq 15\%$ sand, add "with sand" to group name.
- Gravels with 5 to 12% fines require dual symbols:
GW-GM well-graded gravel with silt
GW-GC well-graded gravel with clay
GP-GM poorly graded gravel with silt
GP-GC poorly graded gravel with clay
- If fines classify as CL-ML, use dual symbol GC-GM or SC-SM.
- If fines are organic, add "with organic fines" to group name.
- If soil contains $\geq 15\%$ gravel, add "with gravel" to group name.
- Sand with 5 to 12% fines require dual symbols:
SW-SM well-graded sand with silt
SW-SC well-graded sand with clay
SP-SM poorly graded sand with silt
SP-SC poorly graded sand with clay
- If Atterberg limits plot in hatched area, soil is a CL-ML, silty clay.
- If soil contains 10 to 29% plus No. 200, add "with sand" or "with gravel" whichever is predominant.
- If soil contains $\geq 30\%$ plus No. 200, predominantly sand, add "sandy" to group name.
- If soil contains $\geq 30\%$ plus No. 200, predominantly gravel, add "gravelly" to group name.
- $PI \geq 4$ and plots on or above "A" line.
- $PI < 4$ or plots below "A" line.
- PI plots on or above "A" lines.
- PI plots below "A" line.



Laboratory Tests

DD Dry density, pcf	OC Organic content, %
WD Wet density, pcg	S Percent of saturation, %
MC Natural moisture content, %	SG Specific gravity
LL Liquid limit, %	C Cohesion, psf
PL Plastic limits, %	Ø Angle of internal friction
PI Plasticity index, %	qu Unconfined compressive strength, psf
P200 % passing 200 sieve	qp Pocket penetrometer strength, tsf

Particle Size Identification

Boulders.....	over 12"
Cobbles	3" to 12"
Gravel	
Coarse	3/4" to 3"
Fine.....	No. 4 to 3/4"
Sand	
Coarse	No. 4 to No. 10
Medium	No. 10 to No. 40
Fine.....	No. 40 to No. 200
Silt	<No. 200, PI < 4 or below "A" line
Clay	<No. 200, PI ≥ 4 and on or about "A" line

Relative Density of Cohesionless Soils

Very Loose.....	0 to 4 BPF
Loose.....	5 to 10 BPF
Medium dense	11 to 30 BPF
Dense	31 to 50 BPF
Very dense.....	over 50 BPF

Consistency of Cohesive Soils

Very soft.....	0 to 1 BPF
Soft	2 to 3 BPF
Rather soft	4 to 5 BPF
Medium	6 to 8 BPF
Rather stiff	9 to 12 BPF
Stiff	13 to 16 BPF
Very stiff.....	17 to 30 BPF
Hard.....	over 30 BPF

Drilling Notes

Standard penetration test borings were advanced by 3 1/4" or 6 1/4" ID hollow-stem augers, unless noted otherwise. Jetting water was used to clean out auger prior to sampling only where indicated on logs. All samples were taken with the standard 2" OD split-tube samples, except where noted.

Power auger borings were advanced by 4" or 6" diameter continuous flight, solid-stem augers. Soil classifications and strata depths were inferred from disturbed samples augered to the surface, and are therefore, somewhat approximate.

Hand auger borings were advanced manually with a 1 1/2" or 3 1/4" diameter auger and were limited to the depth from which the auger could be manually withdrawn.

BPF: Numbers indicate blows per foot recorded in standard penetration test, also known as "N" value. The sampler was set 6" into undisturbed soil below the hollow-stem auger. Driving resistances were then counted for second and third 6" increments, and added to get BPF. Where they differed significantly, they are reported in the following form: 2/12 for the second and third 6" increments, respectively.

WH: WH indicates the sampler penetrated soil under weight of hammer and rods alone; driving not required.

WR: WR indicates the sampler penetrated soil under weight of rods alone; hammer weight, and driving not required.

TW: TW indicates thin-walled (undisturbed) tube sample.

Note: All tests were run in general accordance with applicable ASTM standards.

Required Contractor's Statement - Plymouth Sales Tax Exemption

As part of the 2017 legislative session, a City of Plymouth sales tax exemption was enacted allowing the City to apply for a refund of sales tax paid on materials and supplies related to improvement projects. If you are authorized as the prime contractor for a City of Plymouth project, you are required to provide certain information on the project as requested below. You must also include information from your subcontractors. The information required can be submitted to the City upon finalization of the project. For your reference, the State Statute is included.

297A.71 Subd. 44 (2) (b)

Materials and supplies used or consumed in and equipment incorporated into the construction, remodeling, expansion, or improvement of an ice arena or other buildings or facilities owned and operated by the city of Plymouth are exempt. For purposes of this paragraph, "facilities" include municipal streets and facilities associated with streets including but not limited to lighting, curbs and gutters, and sidewalks.

297A.75 Subd. 3.

The application must include sufficient information to permit the commissioner to verify the tax paid. If the tax was paid by a contractor, subcontractor, or builder, under subdivision 1, clauses (3) to (13) or (15) to (17) the contractor, subcontractor, or builder must furnish to the refund applicant a statement including the cost of the exempt items and the taxes paid on the items unless otherwise specifically provided by this subdivision. The provisions of sections 289A.40 and 289A.50 apply to refunds under this section. <https://www.revisor.mn.gov/statutes/?id=297A>.

Data Collection

Prime Contractor Name:		Subcontractor Name:	
Project Name:		City Project Number:	
Project Completion Date			

Based upon a review of our records, it has been determined the following amounts were paid in relation to the above referenced project:

Invoice Date	Invoice Number	Supplier	Description of Purchase	Invoice Total	MN Sales Tax	Local Sales Tax	Total Taxes
							\$0.00
							\$0.00
							\$0.00
							\$0.00
							\$0.00
							\$0.00
TOTALS:				\$0.00	\$0.00	\$0.00	\$0.00

Certification

I certify that the amounts listed above have been paid and directly relate to the referenced project. The tax amount is for materials and supplies for the qualified project and does not include any amounts paid for equipment and machinery purchased or leased by us and used in fulfillment of this contract or project. I declare under the penalties of criminal liability for willfully making a false claim that this statement has been examined, and to the best of my knowledge, is true and complete.

MN Identification Number: _____	Email: _____
Address: _____ _____	Certifying Business Agent: _____
	Title: _____
	Signature: _____
Phone: _____	Date: _____
Estimated time to complete statement: _____	