SPECIFICATIONS

for the

.DENTON SEWER EXTENSION PROJECT

.Caroline County
.May 2023

Local Contracting Unit:

.Town of Denton
.4 N. Second Street
.Denton, MD 21629

Design Professional:

REMINGTON & VERNICK ENGINEERS

.262 Chapman Road, Suite 105
.Newark, DE 19702

RVE File No. .MCDNT014

Christopher J. Fazio, P.E., C.M.E., Executive Vice President

7-19-2023
Date

PROPOSAL SECTION

BID SUBMISSION CHECKLIST

Name of Local Contracting Unit: Town of Denton

Project Title: Denton Sewer Extension Project

RVE File Number: MCDNT014

A. Bid Submission Checklist. The following documents must be submitted prior to the advertised bid opening. Failure to submit a bid guarantee will result in rejection of the bid. Failure to submit any other documents listed on this Bid Submission Checklist may result in rejection of the bid.
   1. Bid Form.
   2. Bid Security.
   3. Consent of Surety.
   4. Proposal Section. The Proposal Section includes the following documents which must be completed and submitted:
      a) Bid Submission Checklist (P-1)
      b) Statement of Corporate Ownership (P-3).
      c) Non-collusion Affidavit (P-5).
      d) Bid Security (P-7).
      e) Consent of Surety (P-8).
      f) Background Questionnaire (P-9).
      g) Subcontractor Declaration (P-12).
      h) Certificate of Bidder Showing Ability to Perform Contract (P-14).
      i) Acknowledgement of Receipt of Changes to Bid Documents Form (P-16).

B. SIGNATURE: The undersigned does hereby acknowledge all of the documents listed above.

Name of Bidder

Street Address

City State Zip

( ) -

Telephone Number E-mail Address

By Authorized Representative of Bidder:

Signature Date

Print Name and Title

State of Maryland)
) S.S.
County of _____)

On this, the _____ day of _____, 20_____, before me a notary public, the undersigned officer, personally appeared _____, known to me (or satisfactorily proven) to be the person whose name is subscribed to the within instrument, and acknowledge that they executed the same for the purposes therein contained.

In witness hereof, I hereunto set my hand and official seal.

Notary Public

STATEMENT OF CORPORATE OWNERSHIP

Check the appropriate box:

☐ Corporation ☐ Limited Liability Company ☐ Partnership ☐ Sole Proprietor

A. No corporation or partnership shall be awarded any contract by the state, county, municipality or school district, or any subsidiary or agency thereof, unless prior to the receipt of the bid of the corporation or partnership, there is submitted to the Local Contracting Unit a statement setting forth the names of all individuals who own 10% or more of stock or interest in the corporation or partnership.
   1. If the bidder is a partnership, then the statement shall set forth the names and addresses of all partners who own a 10% or greater interest in the partnership.
   2. If the bidder is a corporation, then the statement shall set forth the names and addresses of all stockholders in the corporation who own 10% or more of its stock in any class.
   3. If a corporation owns all or part of the stock of the corporation or partnership submitting the bid, then the statement shall include a list of the stockholders who own 10% or more of the stock of any class of that corporation.
   4. If the bidder is other than a corporation or partnership, the bidder shall indicate the form of corporate ownership as listed below.

B. Bidder must complete one of the following statements:
   1. Stockholders or Partners owning 10% or more of the company submitting a bid:
      a) NAME: _____
         ADDRESS: _____
      b) NAME: _____
         ADDRESS: _____
      c) NAME: _____
         ADDRESS: _____

      _____
      Signature Date

   2. No Stockholder or Partner owns 10% or more of the company submitting the bid:

      _____
      Signature Date

3. Bid is being submitted by an individual who operates as a sole proprietorship:

_____

Signature Date

4. Bid is being submitted by a corporation or partnership that operates as a (check one of the following):

☐ Limited Partnership ☐ Limited Liability Corporation

☐ Limited Liability Partnership ☐ Subchapter S Corporation

Stockholders or Partners owning 10% or more of the form of corporation or partnership checked above shall provide the following information:

a) NAME: _____

ADDRESS: _____

b) NAME: _____

ADDRESS: _____

c) NAME: _____

ADDRESS: _____

d) NAME: _____

ADDRESS: _____

e) NAME: _____

ADDRESS: _____

_____

Signature Date

NON-COLLUSION AFFIDAVIT

Title of Project: Denton Sewer Extension Project

Local Contracting Unit: Town of Denton

State of Maryland)

) S.S.

County of _____)

I state that I am the _____ (Title) of _____ (Name of Firm) and that I am authorized to make this affidavit on behalf of my firm, and its owners, directors, and officers. I am the person responsible in my firm for the price(s) and the amount of this bid.

I state that:

1. The price(s) and amount of this bid have been arrived at independently and without consultation, communication or agreement with any other contractor, bidder or potential bidder.
2. Neither the price(s) nor the amount of this bid, and neither the approximate price(s) nor approximate amount of this bid, have been disclosed to any other firm or person who is a bidder or potential bidder, and they will not be disclosed before the bid opening.
3. No attempt has been made or will be made to induce any firm or person to refrain from bidding on this contract, or to submit a bid higher than this bid, or to submit any intentionally high or noncompetitive bid or other form of complementary bid.
4. The bid of my firm is made in good faith and not pursuant to any agreement or discussion with, or inducement from, any firm or person to submit a complementary or other noncompetitive bid.
5. _____ (Name of Firm), its affiliates, subsidiaries, officers, directors, and employees are not currently under investigation by any governmental agency and have not in the last four years been convicted or found liable for any act prohibited by state or federal law in any jurisdiction, involving conspiracy or collusion with respect to proposing and/or bidding on any public contract, except as follows:

   _____

I state that _____ (Name of Firm) understands and acknowledges that the above representations are material and important, and will be relied upon by the Local Contracting Unit in awarding the contract(s) for which this bid is submitted. I understand and my firm understands that any

misstatement in this affidavit is and shall be treated as fraudulent concealment from the Local Contracting Unit of the true facts relating to the submission of bids for this contract.

Signature Date

Print Name and Title

On this, the _____ day of _____, 20_____, before me a notary public, the undersigned officer, personally appeared _____, known to me (or satisfactorily proven) to be the person whose name is subscribed to the within instrument, and acknowledge that they executed the same for the purposes therein contained.

In witness hereof, I hereunto set my hand and official seal.

Notary Public

BID SECURITY

Title of Project: Denton Sewer Extension Project

Local Contracting Unit: Town of Denton

A. Bid security in the form of either a bid bond in the amount of 10% of the total amount bid or a cashier's check in the amount of 10% of the total amount bid is to be submitted prior to the bid opening time. Bid bonds may be provided in the form of AIA Document A310 or an equivalent. Bid security must be made payable to the Local Contracting Unit.

B. All bidders must have an original copy of their bid security in their own possession prior to the advertised bid opening and must be able to deliver an original copy of their bid security to the Local Contracting Unit within three (3) business days of receipt of a written request from the Local Contracting Unit. Failure to deliver an original copy of bid security to the Local Contracting Unit within three (3) business days will result in rejection of the bid.

C. If the successful bidder has posted a bid bond, cashier's check, or any other form of security and refuses to accept a contract when tendered, they will be required to forfeit such bid security.

D. Any payment made to the Local Contracting Unit by reason of default of the bidder shall not be construed as a penalty, but as liquidated damages for breach of contract.

CONSENT OF SURETY

A. Attach a Consent of Surety from a Surety Company, meeting the requirements described herein, stating that if the bidder is awarded the contract that the Surety Company will supply the bonds for the contract.
   1. Consent of Surety must be an irrevocable, unconditional commitment by the Surety Company to issue on behalf of the bidder the bond or bonds upon award of the project in the full amount specified.
   2. Consent of Surety must include all bonds required by the contract documents (i.e. performance, labor and material payment, maintenance, environmental, etc.).
   3. Consent (Certificate) of Surety is not waivable and will be considered a material defect resulting in rejection of bid if omitted from bid package.
   4. Consent of Surety must not contain any provision that would serve to limit the Surety Company's liability to "spread the second" bidder in the event the bidder fails to enter into a contract upon award.

B. Sample wording for Consent of Surety is shown below:

CONSENT OF SURETY

KNOW ALL MEN BY THESE PRESENTS, that for and consideration of the sum $ _____.____, lawful money of the United States of America, the receipt whereof is hereby acknowledged, paid the undersigned, and for other valuable consideration, the _____ (Insurance Company Name), _____ (Insurance Company Address), existing under the laws of the State of Maryland and licensed to do business in the same, certifies and agrees that if the contract for _____ (Contracting Agency) for _____ (Project Title) is awarded to _____ (Bidder), the undersigned will execute the bond or bonds required of the contract documents and will become Surety in the full amount set forth in the contract documents for the faithful performance of all obligations of the Bidder, provided however, that this commitment shall expire ninety (90) calendar days from the bid opening, unless agreed upon by Bidder, Owner and Surety to be extended.

Signed, sealed and dated this _____ day of _____, 20_____.

_____ (Insurance Company Name)

By _____ (Attorney-in-Fact)

(To be accompanied by the usual proof of Authority of Offices of offices of the Surety Company to execute same.)

Background Questionaire

A. In accordance with the paragraph entitled "Qualifications of Bidders" of the Information for Bidders, provide the following information:

1. Date of Organization of Company: _____

2. Name and Address of Officers:

   a) President: _____

   b) Vice President: _____

   c) Secretary: _____

   d) Treasurer: _____

3. Experience:

   a) How many years has your organization been in business under your present business name? _____

   b) How many years of experience does your organization have with the type of construction work involved in this contract? _____

   c) What are the latest projects (within the last 5 years) that your organization has completed? (Attach additional pages if necessary)

#	Project Name	Contract Amount	Date of Completion	Contracting Agency
1				
2				
3				
4				
5				

   d) References for projects listed above:

#	Project Name	Contact Name	Telephone Number
1			
2			
3			
4			
5			

4. Have you ever failed to complete any work awarded to you (within the last 10 years)? _____
   a) If so, where and why? _____
   _____
   _____
5. Have you or has any officer or your organization ever been an officer or partner of some other contracting organization that failed to complete any work (within the last 10 years)? _____
   a) If so, state the name of the individual, position and the name of the other organization:
   _____
   b) Did this other contracting agency ever fail to complete any work awarded to it (within the last 10 years)? _____
      (1) If so, where and why? _____
      _____
      _____
6. Provide a listing of all uncompleted contracts presently held by your organization:

#	Name of Contract	Contracting Agency	Contract Amount
1			
2			
3			
4			
5			

7. State approximately the largest amount of work that your organization has completed within any calendar year (within the last 5 years) or similar nature to the work being bid on. _____
   _____
8. List the equipment presently available for the performance of the work under the proposed contract (attach additional pages if necessary). _____
   _____
   _____
   _____
   _____
   _____
   _____

9. For any contract which includes more than 500 square yards or 50 tons of asphalt paving work, list the make and model of the following paving equipment to be used (attach additional pages if necessary).
   a) Milling Machine: _____
   b) Roller: _____
   c) Bituminous Tack Distributor: _____
   d) Bituminous Paver: _____

   Note: Failure by a bidder to list equipment which meets the requirements of the specifications of this contract shall not invalidate the bid nor absolve the bidder of their responsibility to secure and use equipment which meets the requirements of the specifications.

SUBCONTRACTOR DECLARATION

Title of Project: Denton Sewer Extension Project

Local Contracting Unit: Town of Denton

A. Each bidder shall set forth in their bid the names, addresses and license numbers (where required) of each subcontractor for the furnishing of plumbing and gas fitting, and kindred work, and of the steam and hot water heating and ventilating apparatus, steam power plants and kindred work, and electrical work, structural steel and ornamental iron work, if any, for the construction, alteration or repair of public buildings.

B. A general contractor that intends to utilize a specific subcontractor to perform work in one or more of the specialty trade categories shall provide the required information with regard to that subcontractor in the appropriate space for each specialty trade category applicable to the contract.

C. There shall be submitted proof that each subcontractor is qualified in accordance with the rules and regulations of the state in which the project is located, when such rules and regulations exist.

D. A general contractor that intends to perform work in one or more specialty trade categories either through the use of its own employees or the general contractor themselves, rather than through the utilization of a subcontractor, shall write the word "IN-HOUSE" next to each applicable category and then insert the name and license number (where required), of each such employee of the general contractor or the general contractor themselves in the appropriate spaces provided for each specialty trade category applicable to the contract. If the contract does not involve any of the specialty trade categories below, insert the word "NONE" in the appropriate spaces provided. (Attach additional pages if necessary)

1. Plumbing.

Name:		Telephone:	
Address:			
License #:			

2. Heating, Ventilating and Air Conditioning.

Name:		Telephone:	
Address:			
License #:			

3. Electrical.

Name:		Telephone:	
Address:			
License #:			

4. Other: _____

Name:		Telephone:	
Address:			
License #:			

5. Other: _____

Name:		Telephone:	
Address:			
License #:			

6. Other: _____

Name:		Telephone:	
Address:			
License #:			

7. Other: _____

Name:		Telephone:	
Address:			
License #:			

8. Other: _____

Name:		Telephone:	
Address:			
License #:			

9. Other: _____

Name:		Telephone:	
Address:			
License #:			

CERTIFICATE OF BIDDER SHOWING ABILITY TO PERFORM CONTRACT

Title of Project: Denton Sewer Extension Project

Local Contracting Unit: Town of Denton

AFFIDAVIT

State of Maryland)

) S.S.

County of _____)

Before me, the undersigned notary public, this day, personally appeared _____ known to me (or satisfactorily proven), who being sworn according to law, deposes the following:

I, _____ of the (City, Town, Township, Borough, etc.) of _____ in the County of _____ and the State of _____ of full age, being duly sworn according to law on my oath depose and say that:

A. I am a(n) owner, partner, shareholder or officer of the company set forth below and am duly authorized to execute this affidavit on its behalf.

B. Select the appropriate statement:

☐ I own, lease or control the necessary equipment required by the plans, specifications, and advertisement under which bids are asked for.

☐ I do not own, lease or control the necessary equipment required by the plans, specifications, and advertisements under which bids are asked for.

C. If the bidder does not own, lease or control all of the necessary equipment, provide the source from which the equipment will be obtained: (Attach additional pages if necessary.) _____

_____

_____

_____

_____

1. Attach certification from the owner, lessee or person in control of the equipment definitely granting to the bidder the control of the equipment required during such time as may be necessary for the completion of that portion of the contract for which it is necessary.

_____

Name of Bidder

By Authorized Representative of Bidder:

Signature Date

Print Name and Title

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

Notary Public

ACKNOWLEDGEMENT OF RECEIPT OF CHANGES TO BID DOCUMENTS FORM

Title of Project: Denton Sewer Extension Project

Local Contracting Unit: Town of Denton

A. By listing and initialing next to each notice, revision or addenda to the bid advertisement, specifications or bid documents, the undersigned bidder hereby acknowledges their receipt. By indicating date of receipt, bidder acknowledges the submitted bid takes into account the provisions of the notice, revision, or addendum. Note that the local unit's record of notice to bidders shall take precedence and that failure to include provisions of changes in a bid proposal may be subject for rejection of the bid.

Local Contracting Unit Designation		Date Received	Bidder's Initials
Notice, Revision or Addenda Number	Title or Description		

Acknowledged by Bidder:

Name of Bidder

By Authorized Representative of Bidder:

Signature Date

Print Name and Title

Pricing Form

Base Bid

LineItemNumber	Description	UnitOfMeasure	Estimated Quantity	Unit Price	Extended Price
1	Mobilization (2.5% of Bid or Up To Max of $50,000)	LS	5		
2	Two Year Maintenance Bond	LS	1		
3	Temporary Erosion and Sediment Control Measures	LS	1		
4	Record Drawings	LS	1		
5	Maintenance And Protection Of Traffic	LS	1		
6	Selective Demolition	LS	1		
7	Furnish and Install 8-Inch PVC Sewer Main, Including Excavation, Stone Bedding & Backfill, Graded Aggregate Base Course, Asphalt Base Course, and Temporary Surface Course, All Connections, All Fittings, Testing, Complete	LF	2800		
8	Furnish and Install 12-Inch PVC Sewer Main, Including Excavation, Stone Bedding & Backfill, Graded Aggregate Base Course, Asphalt Base Course, and Temporary Surface Course, All Connections, All Fittings, Testing, Complete	LF	2300		
9	Furnish and Install Sanitary Sewer Manhole, Including Excavation, Stone Bedding & Backfill, Graded Aggregate Base Course, Asphalt Base Course, and Temporary Surface Course, All Connections, All Fittings, Testing, Complete	EA	23		
10	Connection to Existing Manhole	EA	2		

LineItemNumber	Description	UnitOfMeasure	Estimated Quantity	Unit Price	Extended Price
11	Furnish and Install 6" PVC Sewer Service Lateral, Including Wye, Cap, Excavation, Stone Bedding & Backfill, Graded Aggregate Base Course, Asphalt Base Course, and Temporary Surface Course, All Connections, All Fittings, Testing, Complete	LF	550		
12	Furnish and Install 8-Inch C900 Water Main, Including Excavation, Stone Bedding & Backfill, Graded Aggregate Base Course, Asphalt Base Course, and Temporary Surface Course, All Connections, All Fittings, Joint Restraint, Thrust Blocks, Pressure Testing And Disinfection, Complete	LF	600		
13	Furnish and Install 8-Inch Gate Valve And Box, Including Excavation, Stone Bedding & Backfill, Graded Aggregate Base Course, Asphalt Base Course, and Temporary Surface Course, All Connections, All Fittings, Joint Restraint, Thrust Blocks, Pressure Testing And Disinfection, Complete	EA	4		
14	Furnish and Install 12-Inch C900 Water Main, Including Excavation, Stone Bedding & Backfill, Graded Aggregate Base Course, Asphalt Base Course, and Temporary Surface Course, All Connections, All Fittings, Joint Restraint, Thrust Blocks, Pressure Testing And Disinfection, Complete	LF	1700		
15	Furnish and Install 12-Inch Gate Valve And Box, Including Excavation, Stone Bedding & Backfill, Graded Aggregate Base Course, Asphalt Base Course, and Temporary Surface Course, All Connections, All Fittings, Joint Restraint, Thrust Blocks, Pressure Testing And Disinfection, Complete	EA	5		
16	Furnish and Install Fire Hydrant Including Excavation, Stone Bedding & Backfill, Graded Aggregate Base Course, Asphalt Base Course, and Temporary Surface Course, All Connections, All Fittings, Joint Restraint, Thrust Blocks, Pressure Testing And Disinfection, Tee, Gate Valve, And Fittings, Complete	EA	3		

LineItemNumber	Description	UnitOfMeasure	Estimated Quantity	Unit Price	Extended Price
17	Furnish and Install 1.5" I.P.S. Water Service, Including Tap, Corp Stop, Meter Pit, Excavation, Stone Bedding & Backfill, Graded Aggregate Base Course, Asphalt Base Course, and Temporary Surface Course, All Connections, All Fittings, Testing, Complete	LF	500		
18	Asphalt Milling, 2" Thick	SY	12500		
19	Bituminous Surface Treatment, 2" Thick	SY	12500		
23	Plain Concrete Driveway Apron	SY	240		
24	Plain Concrete Curb	LF	500		
25	Plain Concrete Sidewalk	SY	240		
26	Line Striping, Replace in Kind	LS	1		
	Project Total				

INFORMATION FOR BIDDERS

TABLE OF CONTENTS

1.0 GENERAL.

1.01 Project Information:

A.	Project Title:	Denton Sewer Extension Project
B.	Project County:	Caroline County
C.	Local Contracting Unit:	Town of Denton 4 N. Second Street Denton, MD 21629
D.	Design Professional:	Remington & Vernick Engineers (RVE) 262 Chapman Road, Suite 105 Newark, DE 19702

2.0 BID PREPERATION

2.01 Examination & Responsibility.

A. Bidders are directed to examine for themselves the drawings, specifications, estimated quantities and the location of the proposed work. They shall exercise their own judgment as to the scope and nature of the work, the difficulties to be encountered and the quantities that may actually be required to complete the proposed work. Each bidder is fully responsible for having reviewed and understood these specifications prior to submitting their bid, and for ensuring that their bid covers and complies with all requirements of the Contract Documents and shall not at any time thereafter assert any claim related to a misunderstanding of the nature or amount of work to be done.

2.02 Condition of Work.

A. Each bidder must inform themselves fully of the conditions relative to the construction under which the work is now being or will be performed. Failure to do so will not relieve a successful bidder of their obligation to furnish all materials and labor necessary to carry out the provisions of the contract documents and to complete the contemplated work for the construction as set forth in the bid. In carrying out their work, the Contractor must employ such means or methods that will not cause any interruptions or interference with the work of any other contractor (if applicable).

2.03 Obligations of Bidders.

A. At the time of the opening of bids, each bidder will be presumed to have inspected the site and to have read and to be thoroughly familiar with the drawings and contract documents (including all addenda). The failure or omission of a bidder to receive or examine any form, instrument or documents shall in no way relieve the bidder from any obligations contained therein.

2.04 Addenda, Bid Specification Challenges and Interpretations.

A. The Table of Contents indicates the number of pages of each section of the document. If any bidder finds that a page was miss-copied or is missing, please contact the Engineer. The page(s) will be faxed to the bidder. Issuance of any such pages will not be considered an Addendum to the contract or specifications.

B. No interpretations of the meaning of the drawings, specifications or other contract documents will be made to any bidder orally. Every request for such interpretation should be made in writing, addressed to the Engineer, and to be given consideration, must be received at least ten (10) days prior to the final date fixed for receiving bids. Any and all such interpretations and/or supplemental instructions will be in the form of written addenda to the specifications, which if issued, will be issued in accordance with applicable State Laws. Any bidder who wishes to challenge a bid specification shall file such challenges in writing with the Engineer no less than three business days prior to the opening of the bids. Challenges filed after that time shall be considered void and having no impact on the contracting unit or the award of a contract.

C. Failure of any bidder to receive any such addendum or interpretations shall not relieve any bidder from any such obligations therein under his bid submitted. All addenda so issued shall become part of the contract documents, and shall be attached to the bid form when submitted.

2.05 Qualifications of Bidders.

A. The Local Contracting Unit may make such investigation as is necessary to determine the responsibility of the bidder and/or the ability of the bidder to perform the work. The bidder shall furnish the Local Contracting Unit all such information and data for this purpose, as the Local Contracting Unit may request. The Local Contracting Unit reserves the right to reject

any bid if evidence submitted by, or investigation of such bidder fails to satisfy the Local Contracting Unit that said bidder is responsible or properly qualified to carry out the obligations of the contract and to complete the work therein contemplated.

B. Conditional bids will not be accepted. Bids which are incomplete or obscure may be rejected at the option of the Local Contracting Unit.

2.06 Disclosure Statement.

A. No corporation or partnership shall be awarded any contract nor shall any agreements be entered into for the performance of any work or the furnishing of any materials or supplies, the cost of which is to be paid with any public funds, by the State, County, Municipality or School District, or any subsidiary or agency of the State, County, Municipality or School District or by any Authority, Board or Commission which exercises governmental function, unless prior to the receipt of the bid of said corporation or said partnership, there is submitted a statement setting forth the names and addresses of all stockholders in the corporation or partnership who owns ten percent or more of its stock of any class or of all individual partners in the partnership who owns ten percent or greater interest therein, as the case may be. If one or more such stockholders or partners is itself a corporation's stock or the individual partners owning ten percent or greater interest in that partnership, as the case may be, shall also be listed. The disclosure shall be continued until the names and addresses of every non-corporate stockholder and the individual partner exceeding the ten percent ownership criteria established in this contract document has been listed. If the bidder is not a corporation or partnership, it must so indicate on the disclosure statement.

2.07 Manufactured Articles.

A. In the specifications and on accompanying drawings, there are specified and shown certain pieces of equipment and materials, deemed most suitable for the service anticipated. This is not done, however, to eliminate other equipment and materials equally as good and efficient. When a bidder submits an equivalent, it shall be the responsibility of the bidder to document the equivalence claim. Failure to submit such documentation shall be grounds for the rejection of the claim of equivalence. The bidder shall prepare his bid on the basis of the particular equipment and materials specified or shown, and shall be responsible for the coordination, arrangement and location of all equipment and material incorporated in the work.

2.08 Bid Security & Consent of Surety.

A. Each bid shall be accompanied by a Certified Check, Cashier's Check or Bid Bond duly executed by the bidder as principal, and having as surety thereon a Surety Company approved by the Owner, in an amount not less than ten percent (10%) of the amount bid. Any such Bid Bond shall be without endorsement or conditions. Bid shall also be accompanied with a certificate letter from a surety company stating that it will provide the bidder with the requisite completion performance and payment bonds, i.e. a Consent of Surety.

B. Such bid guarantee will be returned to all bidders, except to the three apparent lowest responsible bidders, within ten days after the formal opening of bids, Sundays and holidays excepted.

C. The bid guarantee will be returned to the remaining unsuccessful bidders within three days, Sundays and holidays excepted, after the Owner and the accepted bidder have executed the contract and the Owner has approved the Bidder's Performance Bond, or if no contract has been accepted within 90 days after the date of opening of bids, any bidder upon demand made after the expiration of said 90 day period, shall be entitled to the return of his bid guarantee, so long as he has not been notified by the Owner of the acceptance of his bid.

D. Any such bid guarantee shall be forfeited and become the property of the Owner if the bidder whose bid is accepted shall fail: to give a satisfactory performance bond and labor and material payment bond, or a combination performance and labor and material payment bond, and/or fails to execute a contract within ten (10) days after notice from the Owner to do so.

3.0 SUBMISSION OF BIDS.

3.01 General.

A. Bidder must submit their bid on the respective "Bid Form and Package" included hereto.

B. No bid will be accepted or opened if received after the designated time for receipt.

C. For each bid made, all blank spaces in the Bid Form must be filled in, in ink, with the unit prices of the item and its extension. All bid forms submitted will be checked for arithmetic accuracy.

D. Any bid may be submitted or withdrawn prior to the scheduled time for the opening of bids, or authorized postponement thereof. Any bid received after the time and date specified in the Notice to Bidders will not be considered. No bid may be withdrawn within 90 days after the actual date of opening thereof.

3.02 Price to Include.

A. The bid submitted must cover the entire cost of the contemplated construction and installation, as illustrated on the drawings and in the manner and detail described in the specifications. The price bid for each line item shall cover the entire cost of its installation, construction and completion, including all materials, workmanship and appurtenances necessary for its completion or as implied by illustrations on the drawings, by description in the specifications, or to be reasonably inferred therefrom.

B. If there are minimum unit prices included in the bid form, those unit prices shall be the minimum acceptable unit prices for the corresponding line items of the work. If the bidder fails to propose a unit cost in their bid that is equal to or greater than the minimum unit price indicated on the bid form, then the unit price for the affected line item will be set to equal the minimum unit price indicated on the bid form and the bidder's total bid amount will be adjusted by extension of the minimum unit price.

3.03 Rejection of Bids.

A. The Local Contracting Unit reserves the right to reject all bids, to reject any bid or bids not complying with the specifications, and to waive any informality in any bid or bids if such waiver be deemed by the Local Contracting Unit to be in the best interest of the Local Contracting Unit.

B. Each bidder is instructed to be present in person or by representative at the time and place fixed for the opening of bids and at every subsequent meeting of the Local Contracting Unit at which the bidder is advised, or it has been publicly announced at the time of bids, that said bids shall receive further consideration or shall be acted upon, if said bidder desires an opportunity to be heard.

C. Any of following reasons, either considered independently or in combination with factors, may be considered, in the judgment of the Local Contracting Unit sufficient reasons for bidder disqualification and rejection of the bid(s):

(1) Submittal of more than one bid for the same work from an individual, a firm, a partnership, an association, a subsidiary, an affiliate, or a corporation under the same or different name.

(2) Evidence of collusion among bidders. Any participation in such collusion will receive no recognition as a bidder for future work from the Local Contracting Unit until the participant has been reinstated as a qualified bidder.

(3) Lack of competency, adequate machinery, plant, or of other equipment.

(4) Inability, in the judgment of the Local Contracting Unit to promptly complete the project, because of uncompleted work.

(5) Failure to pay, or satisfactorily settle, all bills due for material furnished, for labor supplied or performed, for rental of equipment used, and for services rendered by public utilities.

(6) Failure to comply with any prequalification requirements which may be established by the Local Contracting Unit.

(7) Contractor currently debarred by Federal or State Authority.

(8) Material or intentional failure to comply with contract, drawings, or specifications, or material or intentional failure to adequately maintain and control traffic during construction on a previous contract.

(9) Failure to properly sign the bid, the required affidavits, or certificate, or any other required documents, said documents being listed in the Proposal Section.

(10) Failure to include a price for each item on the pricing response form, except in the case of alternate bidding; in alternate bidding, failure to include a price for one of the required alternate bid items on the pricing response form.

(11) The inclusion of conditions or qualifications not provided for in the proposal.

(12) The bid contains omission(s) or alteration(s), addition(s) not specified, or deviation(s) of any other kind.

(13) The bid is materially unbalanced. A bid is materially unbalanced when, despite an acceptable total bid price, the price of one or more line items is significantly overstated or understated. A bid may be rejected if the lack of balance poses an unacceptable risk.

(14) Failure by the bidder to satisfy any of the other requirements included with the contract, specifications or plans, including, but not limited to, those requirements listed within the Proposal Section and Information for Bidders section.

3.04 Basis of Bid.

A. The award of the contract will be made, subject to necessary monies to do the work being provided by the Local Contracting Unit either by resolution or ordinance or another lawful manner. The contract will be awarded to the lowest responsive and responsible bidder. The contract to be executed by the successful bidder will provide that it shall not become effective

until the necessary monies to do the work have been provided by the Local Contracting Unit, either by resolution or ordinance or another lawful manner.

B. Pursuant to COMAR 21.05.02.13, the Office will make the award to the responsible and responsive bidder whose bid meets the requirements, evaluation criteria set forth in the invitation for bids and who submitted the most favorable evaluated bid price.

C. No contract shall be awarded to any contractor, subcontractor, or to any firm, corporation, or partnership in which such contractor or subcontractor has an interest, who is debarred from public works. Bidder may be disqualified and his proposal or proposals rejected subject to conditions specified under MDOT "Bidding Requirements and Conditions".

4.0 CONTRACTS.

4.01 Drawings and Specifications to be Furnished.

A. The Local Contracting Unit shall furnish, at no additional cost to the successful bidder, one (1) executed set of the contract documents and two (2) additional copies of the project drawings and specifications. All additional copies of the project drawings and/or specifications shall be furnished by the contractor and they shall bear the reproduction and handling costs thereof.

4.02 Performance, Payment and Maintenance Bonds.

A. The bidder whose bid is accepted shall furnish to the Owner, a performance bond and labor and material payment bond, or a combination performance and labor and material payment bond, and at the completion of the work, a two (2) year maintenance bond, each in the amount of 100% of the final contract price, with such sureties as shall be approved by the Owner and as detailed and described below.

B. All surety companies must be authorized to transact such business in Maryland. The surety must designate a Maryland agent on whom service of process can be made. The Contractor shall be responsible for updating the surety's expiration from the list or an agent change, to the Engineer or Owner. All surety companies must have the minimum capital and surplus or net cash assets required on the date of advertisement for the project. All surety companies must complete a Surety Disclosure Statement and Certification for all payment and performance bonds.

C. In addition, for these public works project bids, including any and all alternates, that equals at least $850,000.00 but not more than $3.5 million, the surety company must hold a current certificate of authority issued by the U.S. Secretary of the Treasury that is valid in Maryland as listed annually in the U. S. Treasury Circular 570. However, if the surety company has been operational for a period in excess of five years, the surety company shall also be considered to have satisfied this requirement if it is rated in one of the three highest categories by an independent nationally recognized United State rating company that determines the financial stability of insurance companies.

D. In addition, for those public works project bids, including any and all alternates, is in excess of $3.5 million, the surety company must hold a current certificate of authority issued by the United States Secretary of the Treasury that is valid in the State of Maryland listed annually in U.S. Treasury Circular 570. And, if the surety company has been operational for a period in excess of five years, it must be rated in one of the three highest categories by an independent, nationally recognized United States rating company that determines the financial stability of insurance companies.

E. A surety company, which seeks to provide a payment and performance bond in excess of $3.5 million, is exempt from the requirement of Treasury Circular 570 if it meets standards developed by the Commissioner of Insurance through regulations which, at least equal, and may exceed, the general criteria required for Treasury listing.

4.03 Laws and Regulations.

A. The bidder's attention is directed to the fact that all applicable Federal, State, County and municipal laws ordinances, regulations, etc. and the rules and regulations of all authorities having jurisdiction over construction of the project shall apply to the contract throughout, and they will be deemed to be included in the contract the same as though therein written out in full including, but not limited to the Department of Transportation Specifications, latest revision - -General Provisions and the Federal Construction Safety Act (Public Law 91-54), Federal Register, Chapter VXII, Part 1926 of Title 29 Code of Federal Regulations, Occupational Safety and Health Regulations for Construction, and subsequent publications updating these regulations.

4.04 Permits.

A. The contractor shall determine which construction permits and licenses shall be needed, and shall prepare applications for all such construction permits, as necessary for the execution of their work.
B. Unless explicitly stated otherwise in the contract documents, the contractor shall be responsible for paying any necessary permitting fees and for bearing the costs thereof.

4.05 Contract Documents.

A. Included with this Information for Bidders section is the "Form of Contract" which shall be the general form of the contract which is executed between the Local Contracting Unit and the contractor.
B. The contractor shall execute and return all contract documents, along with the required bonds, insurance certificates, and any other documents required within ten (10) days after the receipt of a written request for execution.

4.06 Notice to Proceed

A. Only after the approval and execution of the contract documents by all parties, including the Board of Public Works, the Local Contracting Unit, or their authorized representative, may issue a written Notice to Proceed to the contractor which will serve as formal authorization to proceed with the project work.

    (1) The Local Contracting Unit may delay issuance of a Notice to Proceed to the contractor until a pre-construction meeting has taken place and/or until product submittals have been approved by the Local Contracting Unit, or their authorized representative.
    (2) If necessary, the Local Contracting Unit may issue a Limited Notice to Proceed which will serve as formal authorization to proceed with a limited portion of the project work, said portion to be identified therein.

5.0 NONDISCRIMINATION REQUIREMENTS

5.01 BIDDER REFERRED TO LAW

A. The bidder is specifically referred to the Maryland State Code, as amended and the Regulations adopted pursuant thereto, relating to affirmative action in relation to discrimination.

5.02 SPECIFIC LANGUAGE REQUIRED

A. In accordance with the following is made a part of this Contract:

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

(1) The contractor or subcontractor, where applicable, will not discriminate against any employee or applicant for employment because of age, race, creed, color, national origin, ancestry, marital status or sex, affectional or sexual orientation, familial status, liability for service in the Armed Forces of the United States, or nationality. The contractor will take affirmative action to ensure that such applicants are recruited and employed, and that employees are treated during employment without regard to their age, race, creed, color, national origin, ancestry, marital status, sex, affectional or sexual orientation, familial status, liability for service in the Armed Forces of the United States, or nationality. Such action shall include, but not be limited to the following: employment, upgrading, demotion or transfer; recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship. The contractor agrees to post in conspicuous places available to employees and applicants for employment, notices to be provided by the Public Agency Compliance Officer setting forth provisions of this non-discrimination clause.

(2) The contractor or subcontractor, where applicable will, in all solicitations or advertisements for employees placed by or on behalf of the contractor, state that all qualified applicants will receive consideration for employment without regard to age, race, creed, color, national origin, ancestry, marital status, sex, affectional or sexual orientation, familial status, liability for service in the Armed Forces of the United States, or nationality.

(3) The contractor or subcontractor, where applicable, will send to each labor union or representative of workers with which it has a collective bargaining agreement or other contract or understanding, a notice, to be provided by the agency contracting officer advising the labor union or worker's representative of the contractor's commitments under this act and shall post copies of the notice in conspicuous places available to employees and applicants for employment.

(4) The contractor or subcontractor, where applicable, agrees to comply with any Regulations promulgated by the Treasurer pursuant to the Maryland State Code, as amended and supplemented from time to time.

(5) When scheduling workers in each construction trade, the contractor or subcontractor agrees to attempt in good faith to employ minority and female workers in each construction trade consistent with the applicable employment goal prescribed by the Maryland State Code; provided however, that the Department of Labor and Industry, in its discretion, exempt a contractor or subcontractor from compliance with the good faith procedures, as long as the Department of Labor and Industry is satisfied that the contractor is scheduling workers provided by a union which provides evidence, in accordance with standards prescribed by the Department of Labor and Industry, that its percentage of active "card carrying" members who are minority and/or female workers is equal to or greater than the applicable employment goal prescribed by the Maryland State Code, as amended and supplemented from time to time. The contractor or subcontractor agrees that a good faith effort shall include compliance with the following procedures:

(a) If the contractor or subcontractor has a referral agreement or arrangement with a union for a construction trade, the contractor or subcontractor shall, within three days of the contract award, seek assurances from the union that it will cooperate with the contractor or subcontractor as it fulfills its affirmative action obligations under this contract and in accordance with the rules promulgated by the Treasurer pursuant to the Maryland State Code as supplemented and amended from time to time. If the contractor or subcontractor is unable to obtain said assurances from the construction trade union at least five days prior to the commencement of construction work, the contractor or subcontractor agrees directly to attempt to hire minority and female workers consistent with the applicable employment goal. If the contractor's or subcontractor's prior experience with a construction trade union, regardless of whether the union has provided said assurances, indicates a significant possibility that the trade union will not refer sufficient minority and female workers consistent with the applicable employment goal, the contractor or subcontractor agrees to be prepared to hire minority and female workers directly consistent with the applicable employment goal, by complying with the following hiring procedures prescribed under (B) below; and the contractor or subcontractor further agrees to immediately

take said action if it determines or is so notified by the union is not referring minority and female workers consistent with the applicable employment goal.

(b) If the scheduling of a workforce consistent with the employment goal has not or cannot be achieved for each construction trade by adhering to the procedures of (A) above, or if the contractor does not have a referral agreement or arrangement with a union for a construction trade, the contractor or subcontractor agrees to take the following actions consistent with the applicable county employment goals:

(i) To notify the Public Agency Compliance Officer, Department of Labor, and Industry, and at least one approved minority referral organization of its manpower needs and request the referral of minority and female workers.

(ii) To notify any minority and female workers who have been listed with it as awaiting available vacancies.

(iii) Prior to commencement of work, to request the local construction trade union, if the contractor or subcontractor has a referral agreement or arrangement with a union for the construction trade, to refer minority and female workers to fill job openings.

(iv) To leave standing requests for additional referral to minority and female workers with the local construction trade union, if the contractor or sub-contractor has a referral agreement or arrangement with a union for the construction trade, the State Training and Employment Service and other approved referral sources in the area until such time as the workforce is consistent with the employment goal;

(v) If it is necessary to lay off some of the workers in a given trade on the construction site, to assure, consistent with the applicable State and Federal statutes and court decisions, that sufficient minority employees remain on the site consistent with the employment goal; and to employ any minority and female workers so laid off by the contractor or any other construction site in the area on which its workforce composition is not consistent with an employment goal established pursuant to rules implemented by the Maryland State Code.

(vi) To adhere to the following procedure when minority and female workers apply or are referred to the contractors or subcontractor:

1. If said individuals have never previously received any document or certification signifying a level of qualification lower than that required, the contractor or subcontractor shall determine the qualifications of such

individuals and if the contractor's or sub-contractor's workforce in each construction trade is not consistent with the applicable employment goal, it shall employ such persons which satisfy appropriate qualification standards; provided however, that a contractor or subcontractor shall determine that the individual at least possesses the skills and experience recognized by any worker's skills and experience classification determination which may have been made by a Public Agency Compliance Officer, union, apprentice program or a referral agency, provided the referral agency is acceptable to the Department of Labor and Industry and provided further, that if necessary, the contractor or subcontractor shall hire minority and female workers who qualify as trainees pursuant to these regulations. All of the requirements of this paragraph, however, are limited by the provisions of (C) below.

2. If the contractor's or subcontractor's work-force is consistent with the applicable employment goal, the name of said female or minority group individual shall be maintained on a waiting list for the first consideration, in the event the contractor's or subcontractor's workforce is no longer consistent with the applicable employment goal.
3. If, for any reason, said contractor or sub-contractor determines that a minority individual or a female is not qualified or if the individual qualifies as an advanced trainee or apprentice, the contractor or subcontractor shall inform said individual in writing with the reasons for the determination, maintain a copy in its files, and send a copy to the Public Agency Compliance Office and the Department of Labor and Industry.

(vii) To keep a complete and accurate record of all requests made for the referral of workers in any trade covered by the contract, on forms made available by the Department of Labor and shall be submitted promptly to that Office upon request.

(c) The contractor or subcontractor agrees that nothing contained in (B) above shall preclude the contractor or subcontractor from complying with the hiring hall or apprenticeship provisions in any applicable collective bargaining agreement or hiring hall arrangement, and, where required by custom or agreement, it shall send journeymen and trainees to the union for referral, or to the apprenticeship program for admission, pursuant to such agreement or arrangement; provided, however,

that where the practices of a union or apprenticeship program will result in the exclusion of minorities and female or the failure to refer minorities and females consistent with the county employment goal, the contractor or subcontractor shall consider for employment persons referred pursuant to said provisions (B) without regard to such agreement or arrangement; provided further, however, that the contractor or subcontractor shall not be required to employ female and minority advanced trainees and trainees in numbers which result in the employment of advanced trainees and trainees as a percentage of the total workforce for the construction trade, which percentage significantly exceeds the apprentice to journey worker ratio specified in the applicable collective bargaining agreement, or in the absence of a collective bargaining agreement, exceeds the ratio established by practice in the area for said construction trade. Also, the contractor or subcontractor agrees that, in implementing the procedures of the preceding provisions (B), it shall, where applicable, employ minority and female workers residing within the geographical jurisdiction of the union.

(d) The contractor agrees to complete Initial Project Manning Reports on forms distributed by the Public agency awarding the contract or in the form prescribed by the Department of Labor and submit a copy of said form, at the time of award of the construction contract, to the Department of Labor and Industry as well as to the Public Agency Compliance officer; and to submit a copy of the Monthly Project Manning Report once a month (by the seventh work day of each month) thereafter for the duration of this contract to the Department of Labor and Industry and to the Public Agency Compliance Officer. The contractor agrees to cooperate with the public agency in the payment of budgeted funds, as is necessary, for on-the-job and off-the-job programs for outreach and training of minority and female trainees employed on the construction projects.

(e) The contractor and its subcontractors shall furnish such reports or other documents to the Department of Labor and Industry as may be requested by the office from time to time in order to carry out the purposes of these regulations, and public agencies shall furnish such information as may be requested by the affirmative action office for conducting a compliance investigation pursuant to the Maryland State Code.

5.03 CONTRACT PROCEDURES

A. The Contractor must sign a contract containing the mandatory language in Section 4.02 above entitled "Specific Language Required". The construction goals and related contract obligations and procedures, as described in the regulations, do not apply to any construction contractor or subcontractor which submits appropriate evidence that it is operating under a federally approved or sanctioned affirmative action plan.

B. If the contractor refuses to sign a contract containing the mandatory affirmative action contract language, at the time the contract is submitted for signing by the OWNER, then the Owner will reject the contractor's bid as non-responsive. When such a rejection occurs, the same affirmative action requirements shall apply to any other contractor selected by the Owner in accordance with the contracting laws and procedures.

5.04 EQUAL OPPORTUNITY FOR INDIVIDUALS WITH DISABILITIES

A. The contractor and the Owner do hereby agree that the provisions of Title II of the Americans With Disabilities Act of 1990 (the "Act") (42 U.S.C. s12.101 et seq.), which prohibits discrimination on the basis of disability by public entities, in all services, programs and activities provided or made available by public entities, and the rules and regulations promulgated pursuant thereunto, are made part of this contract. In providing any aid, benefit or service on behalf of the Owner pursuant to this contract, the contractor agrees that the performance shall be in strict compliance with the Act.

B. In the event the contractor, its agents, servants, employees, or subcontractors violate or are alleged to have violated the Act during the performance of this contract, the contractor shall defend the Owner in any action or administrative proceeding commenced pursuant to this Act. The contractor shall indemnify, protect, and save harmless the Owner, its agents, servants and employees from and against any and all suits, claims, losses, demands, or damages of whatever kind or nature arising out of or claimed to arise out of the alleged violation. The contractor shall, at its own expense, appear, defend, and pay any and all charges for legal services and any and all costs or other expenses arising from such action or administrative proceeding or incurred in connection therewith.

C. In any and all complaints brought pursuant to the Owner's grievance procedure, the contractor agrees to abide by any decision of the Owner, which is rendered pursuant to, said grievance procedure. If any action or administrative proceeding results in an award of damages against the Owner, or if the Owner incurs any expense to cure a violation of the Act which has

been brought pursuant to its grievance procedure, the contractor shall satisfy and discharge the same at its own expense.

D. The Owner shall, as soon as practical after a claim has been made against it, give written notice thereof to the contractor along with the full particulars of the claim. If any action or administrative proceeding is brought against the Owner or any of its agents, servants and employees, the Owner shall expeditiously forward or have forwarded to the contractor every demand, complaint, notice, summons, pleading, or other process received by the Owner or its representatives.

E. It is expressly agreed and understood that any approval by the Owner of the services provided by the contractor pursuant to this contract will not relieve the contractor of the obligation to comply with the Act and to defend, indemnify, protect, and save harmless the Owner pursuant to this paragraph. It is further agreed and understood that the Owner assumes no obligation to indemnify or save harmless the contractor, its agents, servants, employees, and subcontractors for any claim which may arise out of their performance of this contract.

F. Furthermore, the contractor expressly understands and agrees that the provisions of this indemnification clause shall in no way limit the contractor's obligations assumed in this contract, nor shall they be construed to relieve the contractor from any liability, nor preclude the Owner from taking any other actions available to it under any other provisions of this contract or otherwise at law.

FORM OF CONTRACT

THIS AGREEMENT, between the , a municipal corporation of the State of Maryland, having its principal offices located at , hereinafter referred to as Owner and , having its principal place of business located at hereinafter referred to as "Contractor";

WITNESSETH;

That for and in consideration of the sum of , representing items 1 through , contractor agrees to furnish to the Owner, the labor, material, equipment and services in accordance with the contract documents hereinafter set forth.

That for and in consideration of the amount payable under this agreement by the Owner, the Contractor agrees, at its own proper cost and expense, and with due skill and diligence, that it will complete the , in accordance with the contract documents and in compliance with this agreement.

Contractor agrees to receive as full compensation the amount stated herein, namely , for said services provided to the Owner. Contractor shall be responsible for all loss or damage arising out of the furnishing of the services aforesaid.

To prevent all disputes and litigation, it is agreed by and between the parties to the Contract that the Owner shall in all cases determine the quantity of the goods delivered and paid for under this contract, and as to the interpretation of any ambiguity in or intent of the drawings and specifications.

The Contract documents shall consist of the following:

1. Notice to Bidders.
2. Specifications.
3. Contractors Proposal (as accepted).
4. Contract Agreement.
5. Contract Drawings
6. All Addenda.

The parties to this contract agree to incorporate into this contract the mandatory language of the Regulations pursuant to the State of Maryland State Code, as amended and supplemented from time to time and the contractor or subcontractor agrees to comply fully with the terms, provisions, and obligations of said Regulations.

This agreement, together with the contract documents, form the contract and they are as fully a part of this contract as if hereto attached or herein repeated.

The Owner and the Contractor, for themselves, their heirs, executors, administrators, successors or assigns, hereby agree to the full performance of the covenants herein contained.

IN WITNESS WHEREOF, they have executed this Agreement.

ATTEST:

_____ BY_____

_____ _____

(SEAL) Print Name & Title **Print Name & Title**

Dated this ____ day of _____, 20 ____

ATTEST:

_____ BY_____

(SEAL)

Dated this ____ day of _____, 20 ____

6.0 CERTIFICATE OF INSURANCE.

6.01 Insurance Requirements.

A. The contractor is required to provide a certificate of insurance for the coverage and amounts indicated on the sample certificate of liability insurance certificate provided herein. It is important that a certificate of insurance be provided in a timely manner to facilitate execution of contract documents within the time requirements required elsewhere in the Information for Bidders. Additionally, the minimum amount and type of coverage shown on the sample certificate of liability insurance certificate is not negotiable and is not intended to imply that is all the insurance necessary to protect him/her from all losses or liability. It is the Local Contracting Unit's policy to require all suppliers who make deliveries or perform assembly, repair operations or a service in on or upon our property/premises or property/premises under our care, custody and control to maintain the insurance coverage described below, such insurance must be obtained prior to the start of any such work for the Local Contracting Unit.

(1) Comprehensive General Liability. This coverage must include: Premises-operations, products/completed operations hazard, contractual insurance (blanket coverage), broad form property damage, independent contractors, and personal injury and all other shown on the sample certificate of liability insurance. The minimum coverage amount for bodily injury and property damage combined shall be as shown on the sample certificate of liability insurance.

(a) Contractual Insurance (blanket coverage) shall provide contractual indemnification, including a save harmless agreement which is to be incorporated into all Vouchers, General Purchase Agreements and Contracts.

(b) Indemnification. Supplier shall defend, indemnify and save harmless, the Local Contracting Unit from and against all losses, costs, damages, expense claims or demands arising out of or caused or alleged to have been caused in any manner by a defect in any equipment or materials supplied hereunder or by doing the work herein provided, including all suits or actions of every kind of description brought against the Local Contracting Unit, either individually or jointly with Supplier for or on account of any damage or injury to any person or property, caused or occasioned or alleged to have been caused by or on account of the performance of any work pursuant to or in connection with this contract or through any negligence or alleged negligence in guarding the work or through any act, omission or fault or alleged act, omission or fault of the Supplier, its employees or agents, or others under the Supplier's control.

(2) Automobile Liability. Comprehensive form as shown on the sample certificate of liability insurance certificate.

(3) Workers Compensation. As required by Maryland State Statute.

(4) Excess Liability. Commercial umbrella form - $2,000,000.00.

(5) Other Coverage(s). As shown on the sample certificate of liability insurance certificate.

6.02 Sample Certificate of Liability Insurance Certificate.

ACORD®

CERTIFICATE OF LIABILITY INSURANCE

DATE (MM/DD/YYYY)

THIS CERTIFICATE IS ISSUED AS A MATTER OF INFORMATION ONLY AND CONFERS NO RIGHTS UPON THE CERTIFICATE HOLDER. THIS CERTIFICATE DOES NOT AFFIRMATIVELY OR NEGATIVELY AMEND, EXTEND OR ALTER THE COVERAGE AFFORDED BY THE POLICIES BELOW. THIS CERTIFICATE OF INSURANCE DOES NOT CONSTITUTE A CONTRACT BETWEEN THE ISSUING INSURER(S), AUTHORIZED REPRESENTATIVE OR PRODUCER, AND THE CERTIFICATE HOLDER.

IMPORTANT: If the certificate holder is an ADDITIONAL INSURED, the policy(ies) must be endorsed. If SUBROGATION IS WAIVED, subject to the terms and conditions of the policy, certain policies may require an endorsement. A statement on this certificate does not confer rights to the certificate holder in lieu of such endorsement(s).

PRODUCER	CONTACT NAME:
SAMPLE	PHONE (A/C, No, Ext): / FAX (A/C, No):
	E-MAIL ADDRESS:

INSURER(S) AFFORDING COVERAGE	NAIC #
INSURER A :	
INSURER B :	
INSURER C :	
INSURER D :	
INSURER E :	
INSURER F :	

INSURED: SAMPLE

COVERAGES **CERTIFICATE NUMBER:** **REVISION NUMBER:**

THIS IS TO CERTIFY THAT THE POLICIES OF INSURANCE LISTED BELOW HAVE BEEN ISSUED TO THE INSURED NAMED ABOVE FOR THE POLICY PERIOD INDICATED. NOTWITHSTANDING ANY REQUIREMENT, TERM OR CONDITION OF ANY CONTRACT OR OTHER DOCUMENT WITH RESPECT TO WHICH THIS CERTIFICATE MAY BE ISSUED OR MAY PERTAIN, THE INSURANCE AFFORDED BY THE POLICIES DESCRIBED HEREIN IS SUBJECT TO ALL THE TERMS, EXCLUSIONS AND CONDITIONS OF SUCH POLICIES. LIMITS SHOWN MAY HAVE BEEN REDUCED BY PAID CLAIMS.

INSR LTR	TYPE OF INSURANCE	ADDL INSR	SUBR WVD	POLICY NUMBER	POLICY EFF (MM/DD/YYYY)	POLICY EXP (MM/DD/YYYY)	LIMITS	
	GENERAL LIABILITY						EACH OCCURRENCE	$ 1,000,000
	X COMMERCIAL GENERAL LIABILITY						DAMAGE TO RENTED PREMISES (Ea occurrence)	$ 100,000
	CLAIMS-MADE X OCCUR	X					MED EXP (Any one person)	$ 100,000
							PERSONAL & ADV INJURY	$ 1,000,000
	GEN'L AGGREGATE LIMIT APPLIES PER:						GENERAL AGGREGATE	$ 2,000,000
	POLICY X PRO-JECT LOC						PRODUCTS - COMP/OP AGG	$ 2,000,000
								$ 1,000,000
	AUTOMOBILE LIABILITY						COMBINED SINGLE LIMIT (Ea accident)	$ 1,000,000
	X ANY AUTO						BODILY INJURY (Per person)	$
	ALL OWNED AUTOS / SCHEDULED AUTOS	X					BODILY INJURY (Per accident)	$
	X HIRED AUTOS / X NON-OWNED AUTOS						PROPERTY DAMAGE (Per accident)	$
								$
	X **UMBRELLA LIAB** X OCCUR						EACH OCCURRENCE	$ 2,000,000
	EXCESS LIAB CLAIMS-MADE	X					AGGREGATE	$ 2,000,000
	DED RETENTION $							$
	WORKERS COMPENSATION AND EMPLOYERS' LIABILITY Y / N						X WC STATU-TORY LIMITS / OTH-ER	
	ANY PROPRIETOR/PARTNER/EXECUTIVE OFFICER/MEMBER EXCLUDED? **(Mandatory in NH)**	N / A					E.L. EACH ACCIDENT	$ 100,000
	If yes, describe under DESCRIPTION OF OPERATIONS below						E.L. DISEASE - EA EMPLOYEE	$ 100,000
							E.L. DISEASE - POLICY LIMIT	$ 100,000

DESCRIPTION OF OPERATIONS / LOCATIONS / VEHICLES (Attach ACORD 101, Additional Remarks Schedule, if more space is required)

The following entities shall be included as Additional Insured: (1) Local Contracting Unit; (2) Local Contracting Unit Solicitor; and (3) Remington & Vernick Engineers.

Reference the Project Name:

CERTIFICATE HOLDER

SAMPLE

CANCELLATION

SHOULD ANY OF THE ABOVE DESCRIBED POLICIES BE CANCELLED BEFORE THE EXPIRATION DATE THEREOF, NOTICE WILL BE DELIVERED IN ACCORDANCE WITH THE POLICY PROVISIONS.

AUTHORIZED REPRESENTATIVE

SAMPLE

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7.0 WAGE DETERMINATION.

"General Decision Number: MD20230026 06/02/2023

Superseded General Decision Number: MD20220026

State: Maryland

Construction Types: Heavy (Heavy and Sewer and Water Line)

Counties: Caroline, Dorchester, Kent, St Mary's, Talbot and Worcester Counties in Maryland.

HEAVY CONSTRUCTION PROJECTS (Including Sewer and Water Lines)

Note: Contracts subject to the Davis-Bacon Act are generally required to pay at least the applicable minimum wage rate required under Executive Order 14026 or Executive Order 13658. Please note that these Executive Orders apply to covered contracts entered into by the federal government that are subject to the Davis-Bacon Act itself, but do not apply to contracts subject only to the Davis-Bacon Related Acts, including those set forth at 29 CFR 5.1(a)(2)-(60).

If the contract is entered into on or after January 30, 2022, or the contract is renewed or extended (e.g., an option is exercised) on or after January 30, 2022:	. Executive Order 14026 generally applies to the contract. . The contractor must pay all covered workers at least $16.20 per hour (or the applicable wage rate listed on this wage determination, if it is higher) for all hours spent performing on the contract in 2023.
If the contract was awarded on or between January 1, 2015 and January 29, 2022, and the contract is not renewed or extended on or after January 30, 2022:	. Executive Order 13658 generally applies to the contract. . The contractor must pay all covered workers at least $12.15 per hour (or the applicable wage rate listed on this wage determination, if it is higher) for all hours spent performing on that contract in 2023.

The applicable Executive Order minimum wage rate will be adjusted annually. If this contract is covered by one of the Executive Orders and a classification considered necessary for performance of work on the contract does not appear on this wage determination, the contractor must still submit a conformance request.

Additional information on contractor requirements and worker protections under the Executive Orders is available at http://www.dol.gov/whd/govcontracts.

Modification Number Publication Date

0	01/06/2023
1	04/07/2023
2	06/02/2023

* ELEC0024-004 05/28/2023

CAROLINE, DORCHESTER, KENT, SOMERSET, TALBOT, WICOMICO and WORCESTER COUNTIES

	Rates	Fringes
ELECTRICIAN	$ 30.30	5%+14.69

ELEC0026-013 12/06/2021

ST. MARY'S COUNTY

	Rates	Fringes
Electricians	$ 50.00	20.49+a

a.PAID HOLIDAYS: New Year's Day, Inauguration Day, Martin Luther King Jr.'s Birthday, Memorial Day, Independence Day, Labor Day, Veterans' Day, Thanksgiving Day, the day after Thanksgiving Day and Christmas Day.

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* SUMD2010-052 09/28/1995

	Rates	Fringes
Carpenters	$ 12.89 **	1.12
Laborers:		
Pipelayers	$ 9.08 **	
Unskilled	$ 7.60 **	1.23
Painters: (Brush)	$ 9.43 **	
Plumbers	$ 10.50 **	1.06
Power equipment operators:		
Backhoes	$ 12.29 **	
Bulldozers	$ 12.25 **	1.62
Cranes	$ 15.55 **	2.50
Excavators	$ 12.54 **	2.14
Loaders	$ 11.99 **	
Trenching Machines	$ 15.00 **	
Truck Driver, Dump	$ 9.23 **	1.61

WELDERS - Receive rate prescribed for craft performing operation to which welding is incidental.

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** Workers in this classification may be entitled to a higher minimum wage under Executive Order 14026 ($16.20) or 13658 ($12.15). Please see the Note at the top of the wage determination for more information.

Note: Executive Order (EO) 13706, Establishing Paid Sick Leave for Federal Contractors applies to all contracts subject to the

Davis-Bacon Act for which the contract is awarded (and any solicitation was issued) on or after January 1, 2017. If this contract is covered by the EO, the contractor must provide employees with 1 hour of paid sick leave for every 30 hours they work, up to 56 hours of paid sick leave each year. Employees must be permitted to use paid sick leave for their own illness, injury or other health-related needs, including preventive care; to assist a family member (or person who is like family to the employee) who is ill, injured, or has other health-related needs, including preventive care; or for reasons resulting from, or to assist a family member (or person who is like family to the employee) who is a victim of, domestic violence, sexual assault, or stalking. Additional information on contractor requirements and worker protections under the EO is available at https://www.dol.gov/agencies/whd/government-contracts.

Unlisted classifications needed for work not included within the scope of the classifications listed may be added after award only as provided in the labor standards contract clauses (29CFR 5.5 (a) (1) (ii)).

The body of each wage determination lists the classification and wage rates that have been found to be prevailing for the cited type(s) of construction in the area covered by the wage determination. The classifications are listed in alphabetical order of ""identifiers"" that indicate whether the particular rate is a union rate (current union negotiated rate for local), a survey rate (weighted average rate) or a union average rate (weighted union average rate).

Union Rate Identifiers

A four letter classification abbreviation identifier enclosed in dotted lines beginning with characters other than ""SU"" or ""UAVG"" denotes that the union classification and rate were prevailing for that classification in the survey. Example: PLUM0198-005 07/01/2014. PLUM is an abbreviation identifier of the union which prevailed in the survey for this classification, which in this example would be Plumbers. 0198 indicates the local union number or district council number where applicable, i.e., Plumbers Local 0198. The next number, 005 in the example, is an internal number used in processing the wage determination. 07/01/2014 is the effective date of the most current negotiated rate, which in this example is July 1, 2014.

Union prevailing wage rates are updated to reflect all rate changes in the collective bargaining agreement (CBA) governing this classification and rate.

Survey Rate Identifiers

Classifications listed under the ""SU"" identifier indicate that no one rate prevailed for this classification in the survey and the published rate is derived by computing a weighted average rate based on all the rates reported in the survey for that classification. As this weighted average rate includes all rates reported in the survey, it may include both union and non-union rates. Example: SULA2012-007 5/13/2014. SU indicates the rates are survey rates based on a weighted average

calculation of rates and are not majority rates. LA indicates the State of Louisiana. 2012 is the year of survey on which these classifications and rates are based. The next number, 007 in the example, is an internal number used in producing the wage determination. 5/13/2014 indicates the survey completion date for the classifications and rates under that identifier.

Survey wage rates are not updated and remain in effect until a new survey is conducted.

Union Average Rate Identifiers

Classification(s) listed under the UAVG identifier indicate that no single majority rate prevailed for those classifications; however, 100% of the data reported for the classifications was union data. EXAMPLE: UAVG-OH-0010 08/29/2014. UAVG indicates that the rate is a weighted union average rate. OH indicates the state. The next number, 0010 in the example, is an internal number used in producing the wage determination. 08/29/2014 indicates the survey completion date for the classifications and rates under that identifier.

A UAVG rate will be updated once a year, usually in January of each year, to reflect a weighted average of the current negotiated/CBA rate of the union locals from which the rate is based.

WAGE DETERMINATION APPEALS PROCESS

1.) Has there been an initial decision in the matter? This can be:

* an existing published wage determination
* a survey underlying a wage determination
* a Wage and Hour Division letter setting forth a position on a wage determination matter
* a conformance (additional classification and rate) ruling

On survey related matters, initial contact, including requests for summaries of surveys, should be with the Wage and Hour National Office because National Office has responsibility for the Davis-Bacon survey program. If the response from this initial contact is not satisfactory, then the process described in 2.) and 3.) should be followed.

With regard to any other matter not yet ripe for the formal process described here, initial contact should be with the Branch of Construction Wage Determinations. Write to:

Branch of Construction Wage Determinations
Wage and Hour Division
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

2.) If the answer to the question in 1.) is yes, then an interested party (those affected by the action) can request review and reconsideration from the Wage and Hour Administrator (See 29 CFR Part 1.8 and 29 CFR Part 7). Write to:

Wage and Hour Administrator

U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

The request should be accompanied by a full statement of the interested party's position and by any information (wage payment data, project description, area practice material, etc.) that the requestor considers relevant to the issue.

3.) If the decision of the Administrator is not favorable, an interested party may appeal directly to the Administrative Review Board (formerly the Wage Appeals Board). Write to:

Administrative Review Board
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

4.) All decisions by the Administrative Review Board are final.

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END OF GENERAL DECISIO"

GENERAL CONDITIONS

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1.0 GENERAL.

1.01 Definitions.

The following words and expressions used in the contract documents shall be construed as follows:

A. Contractor:	Party, firm, corporation with whom or which the contract is made, or authorized agent thereof.
B. Day:	Calendar day.
C. Engineer:	Remington & Vernick Engineers 262 Chapman Road, Suite 105 Newark, DE 19702
D. Final Completion:	All warranties and guarantees required pursuant to the Contract Documents shall be assembled and delivered by the Contractor to the Owner as part of the final application for payment. The final Certificate for Payment will not be issued by the Engineer until all warranties and guarantees have been received and accepted by the Owner.
E. Legal Holiday:	Days on which the Owner does not conduct regular business hours. The Contractor is responsible for contacting the Owner for a listing of these days.
F. Local Contracting Agency:	(See "Owner").
G. Owner:	Town of Denton 4 N. Second Street Denton, MD 21629
H. Project:	Denton Water Main Replacements
I. Substantial Completion:	The work will not reach Substantial Completion until all project systems included in the work are operational as designed and scheduled, all designated or required inspections, certifications, permits, approvals, licenses and other documents from any governmental authority having jurisdiction thereof necessary for the beneficial use and occupancy of the work are received, designated instruction of Owner's personnel has been completed, and all final finishes within the Contract are in place. Any

remaining work shall be minor in nature, so that the Owner can occupy the building on that date and the completion of the remaining work by the Contractor would not materially interfere or hamper the Owner's (or those claiming by, through or under the Owner) normal operations. Contractor recognizes that normal operations require the use and occupancy of the work area without interruption and that any punchlist or corrective work shall be done at times when the work area is not so occupied. As a further condition of reaching Substantial Completion, the Contractor shall certify that all remaining work will be completed within thirty (30) consecutive calendar days or as so agreed upon following the date of Substantial Completion. Site related projects and/or projects including facilities with site improvements shall not reach Substantial Completion until such time as all site amenities (i.e. lighting, top paving, striping, fencing, stormwater compliance, etc.) are placed into service leaving only minor improvements that will not hamper access or use to complete the project."

1.02 Special Notice.

A. The "Information for Bidders," "General Conditions," "Notice to Bidders," and "Proposal Section" shall be held equally binding with and are to be considered a part of the specifications and contract and the party of the second part, the Contractor, will be held responsible for neglect in attending to any part, paragraph or item therein.

1.03 Representation of Contractor.

A. The Contractor represents and warrants:
   (1) That they are financially solvent and that they are experienced in and competent to perform the type of work to furnish the labor, plant, materials and supplies or equipment to be so performed or furnished by them; and
   (2) That they are familiar with all Federal, State, County, Municipal and Department Laws, Ordinances and Regulations, which may in any way affect the work or those employed

therein, including, but not limited to, any special Acts relating to the work or to the project of which it is a part; and

(3) That such temporary and permanent work required by the contract documents and is to be done by the Contractor can be satisfactorily constructed and used for the purpose for which it is intended, and that such construction will not injure any persons or damage any property; and

(4) That they have carefully examined the drawings, specifications, and the site of the work, and that from their own investigations they have satisfied themselves as to the nature and location of the work, the character, quality and quantity of surface and subsurface materials likely to be encountered, the character of equipment and other facilities needed for the performance of the work, the general and local conditions and all other items which may in any way affect the work or its performance.

1.04 Subletting or Assigning of Contract.

A. The Contractor shall not assign, sell or transfer or otherwise dispose of the contract or any portion thereof or of the work provided therein or their right, title or interest therein, to any persons, firm or corporation, without prior written consent of the Owner.

1.05 Construing the Specifications.

A. To avoid disputes and litigation, it must be distinctly understood by the Bidder/Contractor that the Engineer shall construe or interpret the specifications and explain any ambiguity therein and shall have the right to decide as to their purpose and intent and the decision of the Engineer upon any such ambiguity shall be final, conclusive and binding.

1.06 Necessary to Complete.

A. If any work or materials are required which are obviously necessary to carry out the full intent and meaning of the said specifications although the same may not be either directly or indirectly in the specifications, the Contractor is hereby bound to furnish the same without charge or claim.

1.07 Drawings and Specifications.

A. The Contractor shall keep at the site of the work one copy of the drawings and specifications signed and identified by the Engineer and shall at all times give the Engineer and other representatives of the Owner access thereto. Anything shown on the drawings and not mentioned in the specifications or mentioned in the specifications and not shown on the drawings, shall have the same effect as if shown or mentioned respectively in both. In case of any conflict between the drawings and specifications, the specifications shall govern. Any ambiguity or discrepancy between drawings and specifications shall be submitted by the Contractor to the Engineer whose decision shall be conclusive.

B. The general arrangement and location of equipment, the various pipe, duct, and conduit runs, etc. are shown on the drawings. All dimensions or the scales of the drawings shall be considered as approximate and shall be checked by each bidder to their own satisfaction prior to bid. The exact location of all parts of the work shall be governed by existing conditions, and the Contractor shall coordinate and locate all work at the time of installation. Any changes in location, etc. from that shown on the drawings, necessary by existing conditions, shall be made by the Contractor at no increase of the contract sum.

1.08 Right-of-Way.

A. All right-of-ways through private property required shall be secured by the Owner. Contractor shall not start construction in right-of-ways until directed by the Engineer. No claim shall be made by the Contractor for damage due to delay in securing right-of-ways.

1.09 Time Limits.

A. The Contractor agrees to start the work herein contracted for within five (5) days from the date of the Engineer's Notice To Proceed to the Contractor directing them to proceed with the work. The time to complete the work contracted for, from the date of the Proceed Order, shall be limited to the following: **120 calendar days.**

B. No extension of time will be allowed for delay from any cause whatsoever, including normal weather conditions unless the Contractor shall have notified the Engineer in writing of such delay and their intention to claim an extension of time within two (2) days after the beginning of such delay. Such notice shall give complete information concerning the nature, extent and cause of the delay. If, in the opinion of the Owner, an extension of time is warranted, the Owner

or Owner's representative will issue a written extension, setting a new time limit for the completion of the work.

1.10 Liquidated Damages.

A. In case the Contractor fails to complete the work contracted for, satisfactory to and acceptable to the Owner within the stipulated time limit, or violates any terms or conditions of said contract, then the Contractor shall and will pay to the Owner for each and every calendar day determined to be in default, the following sums, which are agreed upon, fixed and determined by the parties hereto to be liquidated damages:
   - One (1) to Fifteen (15) Days beyond Contract Time Limits: Five Hundred dollars ($500.00) per Calendar Day.
   - Sixteen (16) to Thirty (30) Days beyond Contract Time Limits: One Thousand dollars ($1,000.00) per Calendar Day.
   - Greater than Thirty (30) Days beyond Contract Time Limits: Two Thousand dollars ($2,000.00) per Calendar Day.

B. The Owner shall recover said damages by deducting the amount thereof out of any money which may be due or become due the Contractor, or by an action of law against the Contractor, their surety or by either or both of these methods.

C. In case the Contractor shall be delayed due to the failure on the part of the Owner to furnish anything on its part to be furnished or for any other cause beyond the control of the Contractor, the Contractor shall be entitled to such an extension of time for the delivery of equipment, materials, work and supplies as in the judgement of the Owner or Owner's representative to be fair and just.

1.11 Owner’s Right to Stop Work or Terminate Contract.

A. The Owner has the right to stop work or terminate the contract, if:
   (1) The Contractor has violated the provisions of these specifications or any other Federal, State or Local law, or
   (2) The Contractor shall be adjudged bankrupt or make an assignment for the benefit of creditors, or

(3) A receiver or liquidator shall be appointed for the Contractor or for any of his property and shall not be dismissed within twenty (20) days after such appointment or the proceedings in connection therewith shall not be stayed on appeal within the said twenty (20) days, or

(4) The Contractor shall refuse or fail, after notice or warning from the Engineer, to supply enough properly skilled workmen or proper materials, or

(5) The Contractor shall refuse or fail to prosecute to work or any part thereof with such diligence as will ensure its completion within the period herein specified (or any duly authorized extension thereof) or shall fail to complete the work within said period, or

(6) The Contractor shall fail to make prompt payment to persons supplying labor or materials for the work, or

(7) The Contractor shall fail or refuse to regard laws, ordinances or regulations or otherwise to be guilty of a violation of any provisions of the contract or the Scope of Work therein, then and in such event, the Owner, without prejudice or any rights or remedy it may have, may give seven (7) days notice to the Contractor to terminate the employment of the Contractor and his right to proceed, either as to the entire work or at the option of the Owner as to any portion thereof as to which delay shall have occurred, and may take possession of the work and complete the work by the Contractor or otherwise, as the Owner may deem expedient. In such case, the Contractor shall not be entitled to receive any further payment until the work is finished. If the unpaid balance of the compensation to be paid the Contractor hereunder shall exceed the expense of so completing the work, including compensation for additional managerial, administrative and inspection services and any damages for delay, such excess shall be paid to the Contractor. If such expense shall exceed such unpaid balance, the Contractor and their sureties shall be liable to the Owner for such expenses. If the right of the Contractor to proceed with the work is terminated, the Owner may take possession of and utilize in completing the work such materials, appliances, supplies, drawings, and equipment, as may be on the site of the work and necessary therefor. If the Owner does not terminate the right of the Contractor to proceed, the Contractor shall continue the work.

B. If the work shall be stopped by order of the Court or any other public authority, for a period of three (3) months without act or fault of the Contractor or of any of his agents, servants, employees, or Subcontractor, the Contractor may, upon ten (10) days notice to the Owner, discontinue his performance of the work and/or terminate the contract, in which event the

liability of the Owner to the Contractor shall be determined as provided in the paragraphs immediately preceding, except that the Contractor shall not be obligated to pay to the Owner any excess of the expense of completing the work over the unpaid balance of the compensation to be paid by the Contractor hereunder.

1.12 Reference to the Standard Specifications.

A. All applicable portions of the work performed under this contract shall comply with the requirements of the current Maryland Department of Transportation Standard Specifications for Construction and Materials, as amended or supplemented and whose specifications are made part of these specifications. The Maryland Department of Transportation Standard Details shall govern except insofar as same are expressly modified, amended, or changed in detail drawings prepared specifically for this particular project.

B. The Standard Specifications are made part of these specifications by this reference as if were set forth in full. It is the responsibility of the prospective bidder to be familiar with these Standard Specifications. Copies may be examined in the Engineer's office or may be purchased from the Maryland Department of Transportation.

C. All applicable portions of the work performed under this contract shall comply with the requirements of the current Town of Denton Standard Specifications and Details for Public Works Constructions, as amended or supplemented and whose specifications are made part of these specifications.

2.0 INSURANCE.

2.01 State Law and Regulations and Insurance.

A. The Contractor must assume all risks connected with his work. They shall comply with all State Laws and Regulations concerning Workmen's Compensation and shall maintain such insurance as will protect them against all claims for damages for personal injury, including death which may arise during prosecution of the contract, either by themselves or by any Subcontractor or anyone directly or indirectly employed by either of them.

2.02 Contractor’s Insurance.

A. The Contractor shall not commence work under this contract, until they have obtained all insurance required under this paragraph and such insurance has been approved by the Owner,

nor shall the Contractor allow any Subcontractor to commence work, in their subcontract until all similar insurance required of the Subcontractor has been so obtained and approved.

B. Insurance coverage shall remain in effect until the project is accepted by the Owner, and at all times thereafter when the Contractor may be removing or replacing defective work.

C. The Contractor shall furnish the Owner with proof of insurance by execution of the Certificate of Insurance, of which a copy is included herein. The Owner, Remington & Vernick Engineers, and the Owner's Solicitor shall be a named additional insured.

D. The Certificate of Insurance shall give the Owner and Engineer thirty (30) days written notice of any material change in, cancellation of, or expiration of the policies.

E. The following types of insurance are required:
   (1) General Liability.
   (2) Automobile Liability.
   (3) Excess Liability.
   (4) Worker's Compensation and Employer's Liability.

F. The amounts for property damage and bodily injury for each type of insurance are as shown on the Certificate of Insurance herein.

G. The Contractor's insurance shall apply to and provide coverage for all Subcontractors and/or suppliers unless the Contractor forwards to the Owner and Engineer the Certificate of Insurance for the Subcontractor and/or supplier.

H. Any insurance company providing coverage must be licensed, admitted, and authorized to do business in Maryland.

2.03 Suit or Claims

A. The Contractor agrees to indemnify and save harmless the Owner and the Engineer and all their agents and employees from actions and suits of every kind and description brought against them, or on account of the use of patented rights, and from any damages or injuries received or sustained by any party, or parties, arising out of any act or omission of the Contractor, their workmen or agents in performance of the work under this agreement, including the furnishing of equipment, materials and supplies at the site of the proposed work.

2.04 Damages to Persons and Property.

A. Contractor shall fully and completely indemnify and same harmless the Owner from damages or injury to persons or property resulting from the performance of the work, or through negligence to the contract, or through the use of any improper or defective machinery implements or appliances or through any act of omission of the Contractor, or his agents, or his employees.

3.0 CONDUCT OF THE WORK.

3.01 Role of the Engineer.

A. The Engineer may verify, by observation and/or required tests, the amount, quality, acceptability and fitness of the materials, equipment and supplies furnished; and shall interpret any ambiguities in the drawings and specifications, contract documents, and any extra work order. Upon request, the Engineer shall confirm in writing any oral direction, requirement, or determination.

B. All work of refilling sunken ditches, repaving over trenches, and keeping the streets and sidewalks in passable condition shall be satisfactorily performed by the Contractor during the construction of the work as well as during the maintenance period. If any work is not done within forty-eight (48) hours after written notice given by the Engineer, the work may be done by the Owner and charged to the Contractor.

3.02 Surveys.

A. Unless otherwise expressly provided for in the specifications, the Contractor will furnish all surveys necessary for the execution of the work. The Owner will furnish a base line and datum bench marks as required. The Contractor shall measure and lay out his work and be responsible for the accuracy thereof from bench marks and base lines established by the Engineer which shall constitute the surveys hereinbefore referred to.

3.03 Preservation of Stakes.

A. The Contractor shall carefully preserve bench marks, reference points and stakes, and in case of willful or careless destruction, the Contractor will be charged with the resulting expense and shall be responsible, for any mistakes that may be caused by their unnecessary loss or disturbance.

3.04 Uses of Premises and Removal of Debris.

A. The Contractor expressly undertakes at their own expense:
   (1) To take every precaution against injuries to persons or damage to property.
   (2) To store their apparatus, materials, supplies, and equipment in such orderly fashion at the site of the work as will not unduly interfere with the progress of their work or the administration of Owner's affairs.
   (3) To place upon the work any part thereof only such loads as are consistent with the safety of that portion of the work.
   (4) To frequently clean up all refuse, scrap material, and debris caused by their operations and at all times the site of the work shall present a neat, orderly condition.
   (5) Before final payment to remove all surplus material, false work, temporary structures, including foundations thereof, plant of any description, and debris of every nature resulting from their operations and to put the site in a neat orderly condition.
   (6) To affect all cutting, fitting, or patching of their work required to make the same conform to the drawings and specifications, and except with the consent of the Engineer, not to cut or otherwise alter the work.

3.05 Injury to Existing Structures.

A. The Contractor shall be responsible for all injury to existing structures met within the prosecution of the work, including the delivery to the site of the proposed improvements of materials and supplies. In case of accident to existing structures met within the prosecution of the work, the Contractor will be required to immediately notify the proper authorities and as soon as possible thereafter also notify the Engineer.

3.06 Correction of Work.

A. The Contractor expressly warrants that their work shall be free from any defects in materials or workmanship and agrees to correct any such defects which may appear in such materials or workmanship within two years or the term of the maintenance bond, whichever is longer, following the final acceptance of the work by the Owner, such final acceptance to be evidenced by an appropriate resolution of the governing body in the case of municipal corporation, quasi municipal corporation, municipal board, municipal commission or other municipal authority or by the issuance of final payment in the case of any Owner other than a municipal corporation,

quasi municipal corporation, municipal board, municipal commission or other municipal authority.

B. Neither the acceptance of the completed work nor payment therefore shall operate to release the Contractor or their surety or sureties from any obligation or obligations under this contract or the bonds required under these Contract Documents.

3.07 Public Utilities.

A. The contract drawings indicate the approximate location of known overhead and subsurface utilities in the vicinity of the work. The bidder is advised to investigate and ascertain for themselves all the facts concerning the actual location of these utilities.

B. The Contractor shall cooperate with the utility Owners in the adjustment of their facilities and shall notify the utility Owners not less than ten (10) days in advance of the time they propose to perform any work that will endanger or affect their facilities.

C. The Contractor shall permit the Owners of utilities, or their agents, access to the site of the work at all times in order to relocate, construct or protect their lines and the Contractor shall cooperate with them in performing this work. Separate payments will not be made for the following:

(1) Coordination and cooperation of the Contractor with the utility companies, nor for the protection or replacement of utilities as specified hereinbefore.

(2) Damages for delay caused by conflicts with utilities outside the jurisdiction of the Owner (ex: gas mains, telephone or electric lines, county storm sewer, water mains, etc.).

D. The bidder shall include all such costs in the prices bid for the various scheduled items in the Bidform.

3.08 Protection of Work and Property.

A. The Contractor shall continuously maintain adequate protection of their work and shall protect Owner's property from injury or loss arising in connection with their work. The Contractor shall also protect all adjacent property as provided by law, and shall be responsible for all injury to property and existing structures sustained during the prosecution of their work, including delivery to the site of the equipment, materials and supplies. The Contractor shall repair and replace any such damage, injury or loss equal or better than the condition of the item prior to the Contractor's action.

B. All passageways, guard fences, light and other facilities required for protection by local authorities, or local conditions must be provided and maintained.

3.09 Contractor to Act in an Emergency.

A. In case of any emergency which threatens loss or injury of property, and/or safety of life, the Contractor is required to act as they see fit. The Contractor shall notify the Engineer thereof immediately thereafter.

3.10 Extra Work.

A. The Contractor further agrees that the Engineer may make such alterations as they may see fit in the form, dimensions, plans for materials of the work, materials and supplies bid upon or any part thereof, either before or after work. If such alterations diminish the quantity of the equipment, materials and supplies to be furnished and delivered to the site or work to be executed, they shall not constitute a claim for damages for anticipated profits on the work that may be dispensed with. If the extra work, change or alteration increases the amount of work to be performed or equipment, they shall be paid for at the price bid. If prices for such extra work are not included in the lump sum prices or unit prices bid, the Contractor hereby agrees to furnish the necessary materials and perform such labor as extra work, and agrees to accept in full payment therefore a price which shall be fixed by the Engineer previous to its commencement. The basis of such estimated cost will be the actual cost of materials, labor, equipment, and 10% overhead plus ten percent (10%) profit. Contractor shall furnish breakdown estimate for such extra work. Change Orders and Open End Contracts will be in accordance with these specifications.

B. The Contractor shall not be entitled to receive payment for any extra work unless the same is certified in writing by the Engineer.

3.11 Dispute Resolution.

A. For construction contracts, the Owner and Contractor agree that in the event of a dispute arising under this contract, it shall be submitted to a process of resolution pursuant to alternative dispute resolution practices, such as mediation, binding arbitration or non-binding arbitration pursuant to industry standards, prior to being submitted to a Court for adjudication. Nothing in this section shall prevent the contracting unit from seeking injunctive or declaratory relief in

court at any time. The alternative dispute resolution practices shall not apply to disputes concerning the bid solicitation or award process, or to the formation of contracts or subcontracts to be entered to.

B. Notwithstanding industry rules or any provision of law to the contrary, whenever a dispute concerns more than one contract, such as when a dispute in a contract involving design, architecture, engineering or management, upon demand of a contracting party, other interested parties to the dispute shall be joined unless the arbitrator or person appointed to resolve the dispute determines that such a joinder is inappropriate.

C. Notwithstanding industry rules or any provision of law to the contrary, whenever more than one dispute of a similar nature arises under a construction contract, or related construction contracts, upon demand of a contracting party, the disputes shall be joined unless the arbitrator of person appointed to resolve the dispute determines that the disputes are inappropriate for joinder.

4.0 CONTRACTOR'S PERSONNEL.

4.01 Personal Attention.

A. The Contractor shall give their personal supervision to the prosecution of the work, or have a competent representative on the work who shall have written authority to carry out the requirements of the Contract Documents. They shall also supply all manpower, materials, and equipment as they may be required in the furnishing and delivery to the site of the proposed work, the equipment, materials and supplies bid upon.

4.02 Contractor's Superintendent.

A. The Contractor shall attend to the work personally or through a competent, English-speaking superintendent, who shall be continually present on the project site whenever work is in progress. Such a superintendent shall be satisfactory to the Owner and Engineer and shall not be removed or replaced without due notice being given the Owner and Engineer. The Superintendent shall have full authority to act for the Contractor without the need to consult any higher level of authority.

4.03 Labor Laws.

A. The Contractor and any Subcontractors shall comply with all the requirements applicable to contracts on behalf of this Owner for construction, alteration or repair of any building or public work.

B. The Contractor hereby agrees to comply in all respects with prevailing wage rates pertaining to the work. The "Wage Rate Determination" is on file in the Engineer's office and is included herein. No public works contract may be awarded to any contractor and subcontractor or to any firm, corporation or partnership in which they have an interest on the attached disbarred bidders list located at the end of this specification, until expiration date given. Workmen shall be paid not less than such prevailing wage rate.

C. Before final payment is made by or on behalf of the Owner of any sum or sums due to the work, the Contractor or Subcontractor shall file with the treasurer of the Owner, written statements certifying to the amounts then due and owing from such contractor or subcontractor filing such statement to any and all workmen for wages due on account of the work, setting forth therein the names of the persons whose wages are unpaid and the amount due to each respectively which statement shall be certified by the oath of the Contractor or Subcontractor .

D. The wage rate shall be determined by the US Department of Labor.

E. Contractors or Subcontractors performing public work of a public body subject to the provisions of this act shall post the wage rates for each craft and classification involved as determined by the US Department of Labor including the effective date of any changes thereof, in prominent and easily accessible places at the site of the work or at such place or places as are used by them to pay workmen their wages.

F. In the event it is found that any workmen, employed by the Contractor or any Subcontractor, on this project, has been paid a rate of wages less than the wage required, the Owner may terminate the Contractor's or Subcontractor's right to proceed with the work or such part of the work as to which there has been a failure to pay required wages and to prosecute the work to completion or otherwise, the Contractor and his surety(ies) shall be liable to the US Department of Labor along with the Owner for any excess costs occasioned thereby.

G. Prior to final payment, the Contractor shall be required to execute and deliver an Affidavit of Compliance in a form provided by the Engineer, as required.

4.04 Contractor's Employee Eligibility.

A. All workmen must be competent and fully qualified in the type of work to be performed. Any employee of the Contractor, who is found by the Engineer to be incompetent, or who is performing their work in an unsightly manner or contrary to the specifications or the Engineer's instructions, or who is disorderly, shall be removed from the project and shall not again be employed on the project without the Engineer's consent.

4.05 Eight-hour Day.

A. All mechanics, workers, laborers, employed or engaged in the work hereunder shall work no more than eight (8) hours in any one day. In case of necessity for the protection of property or human life, mechanics, workmen and laborers may be employed for longer periods than eight hours per calendar day, if paid extra compensation on the basis of eight hours constituting a day's work, in accordance with all State and Federal laws.

4.06 Payment of Employees.

A. The Contractor and each of their Subcontractors shall pay each of their employees engaged in work on the project under this contract in full (less deductions made mandatory by law) in legal tender and not less often than once each month.

4.07 Safety and Health Regulations.

A. The Contractor shall comply with the Department of Labor, Safety and Health Regulations for construction promulgated under the Occupational Safety and Health Act of 1970 (P.L.91-596) and under Section 107 of the Contract Work Hours and Safety Standards for Construction (P.L.91-54).

4.08 Accident Prevention.

A. Precautions shall be exercised at all times for the protection of persons (incl. employees) and property. The safety provisions of applicable laws, buildings, and construction codes shall be observed. Machinery, equipment, and all hazards shall be guarded or eliminated in accordance

with the safety provisions of the Manual of Accident Prevention in Construction published by the Association General Contractors in America and Part VI "Temporary Traffic Control" of the U.S. Dept. of Transportation. Federal Highway Administration "Manual on Uniform Traffic Control Devices", latest edition, whichever is more stringent to the extent that such provisions are not in contravention of applicable law. Contractor alone shall be responsible for the safety, efficiency, and adequacy of their plant, appliances and methods and for any damage which may result from their failure for their improper construction, maintenance or operation. The cost of "Accident Prevention" shall be included in the lump sum or unit price bid whichever is applicable.

5.0 MATERIALS.

5.01 Contractor's Title to Materials.

A. No materials or supplies for the work shall be purchased by the Contractor or by Subcontractor that are subject to any chattel mortgage or under a conditional sale or other agreement by which an interest is retained by the seller. The Contractor warrants that they have good title to all materials and supplies used by the Contractor in the work.

5.02 Royalties and Payments.

A. The Contractor shall pay all royalties and license fees. They shall defend all suits or claims for infringements of any patent rights and shall save the Owner harmless from loss or account thereof.

5.03 Use of Domestic Material.

A. In the performance of the work, the Contractor and all Subcontractors shall use only manufactured materials and farm products of the United States of America, wherever available.
B. All Contractors and Subcontractors shall comply with all State and Federal statues, which relate to the use of domestic materials.

5.04 Ordering Materials.

A. Before ordering materials, the Contractor shall obtain the Engineer's approval of their conformity to the specifications. In the case of concrete aggregate and similar materials,

samples must accompany the request for approval. The Contractor must forward to the Engineer copies of all shipping lists, invoices, or delivery slips accompanying such deliveries.

5.05 Samples.

A. The Contractor shall submit to the Engineer any samples of materials before or during the progress of the work that may be required by the Contract Documents and all materials and workmanship must be equal in every respect to the samples submitted and approved.

5.06 Shop or Setting Drawings.

A. The Contractor shall submit promptly eight (8) copies of each shop or setting drawings, of which two (2) will be returned to the contractor prepared in accordance with the schedule predetermined under the provisions of the preceding paragraph hereof with the Contractor's approval stamp and date thereon. After examination of such drawings by the Engineer, and the return thereof, the Contractor shall make such corrections to the drawings as have been indicated and shall furnish the Engineer with two (2) corrected copies. If requested by the Engineer, the Contractor must furnish additional copies, regardless of corrections made in or approval given to such drawings by the Engineer. The Contractor will nevertheless be responsible for the accuracy of such drawings and for their conformity to the drawings and specifications unless they notified the Engineer in writing of any deviations, at the time they furnished such drawings.

B. The Contractor shall likewise submit, in writing, the type, kind and name of the manufacturer of all materials to be used in the work for the written approval of the Engineer prior to the installation of same.

C. Any equipment or materials installed without the written approval of the Engineer will be required to be removed by the Contractor at their own expense and replaced with equipment and materials as approved.

5.07 Additional Instructions and Detail Drawings.

A. The Contractor will be furnished additional instructions and detail drawings to carry out the work included in the contract as required. The additional drawings and instructions thus supplied to the Contractor will coordinate with the contract documents and will be so prepared

that they can be reasonably interpreted as a part thereof. The Contractor shall carry out the work in accordance with the additional detail drawings and instructions.

B. The Contractor and the Engineer will prepare, jointly (a) a schedule fixing the date at which special drawings will be required and by whom they will be made, such drawings, if any, to be furnished by the Engineer in accordance with said schedule, and (b) a schedule fixing the respective dates for the submission of shop or setting drawings; the beginning of manufacture, testing and installation of materials, supplies, and equipment and the completion of the various parts of the work, each such schedule to be subject to change from time to time in accordance with the progress of the work.

5.08 Or Equal Clauses.

A. Wherever in these contract documents a particular brand, make of materials, device or equipment is shown or specified, such brand, make of material, device or equipment should be regarded merely as a standard.

B. When a bidder submits an equivalent, it shall be the responsibility of the bidder to document the equivalence claim. Failure to submit such documentation shall be grounds for rejection of the claim of equivalence.

C. If two or more brands, makes of material, devices or equipment are shown or specified, each should be regarded as the equal of the other. Any other brand, make of material, devices or equipment, which in the opinion of the Engineer is the recognized equal of that specified, considering quality, workmanship and economy of operation, and is suitable for the purpose intended, will be accepted. All material and workmanship shall, in every respect be in accordance with what, in the opinion of the Engineer is in conformity with approved modern practice.

D. Whenever the drawings, specifications or other contract documents or the direction of the Owner or its authorized agent admit of doubt as to what is permissible, and/or fail to note the quality of any work, that interpretation will be made by the Engineer which is in accordance with approved modern practice to meet the particular requirement of the contract.

E. In all cases, new materials shall be used unless this provision is waived by notice from the Engineer.

5.09 Substitutions.

A. After the execution of the contract, substitution of equipment or materials of makes other than those named in the contract will be considered only for the following reason: That the equipment proposed for substitution is superior or equal in construction and/or efficiency to that named in the contract.

B. Complete data, to include: shop drawings, specifications, performance curves, test results, list of similar installation with years of service, operating and maintenance instruction, a statement that the Contractor agrees to pay all costs that will result directly or indirectly from acceptance of the substitute, and all other necessary information; shall be submitted in triplicate to enable the Engineer to evaluate the proposed substitution equipment or material. The determination as to whether or not such changes will be permitted rests solely with the Engineer.

C. The Contractor shall take and assume full responsibility and bear any extra expense or cost incurred by changes advocated by the Contractor. Those costs include, but are not limited to, review time by the Engineer or the Engineer's Consultants, costs of redesign, and claims of other contractors affected by the resulting change. It will be assumed that the cost to the Contractor of the equipment or materials proposed to be substituted is less than the equipment or materials named in the contract, and if the substitution is approved, the contract price shall be reduced by an amount equal to the savings.

5.10 Material Safety Data.

A. The State Department of Health has adopted a Workplace Hazardous Substance List, which includes substances that pose a threat to the health and safety of employees. Therefore, under the provisions of, the contractor must furnish the Owner a "Material Safety Data Sheet" for each product which is supplied to the Owner which contains a substance listed on the Hazardous Substance List. The Owner reserves the right to request a copy of the applicable Material Safety Data Sheet be forwarded with the delivery of each product. Furthermore, under the provisions of each product shall have a label affixed or stenciled onto any container that contains any substance listed on the Hazardous Substance List.

6.0 INSPECTION AND TESTING.

6.01 Inspection.

A. The Contractor shall afford every facility for inspection of the equipment, materials and supplies at all times by the Engineer prior to the delivery of same to the site of the work. All equipment, supplies and materials shall be tested in the presence of the Engineer, if so desired.

B. Any equipment, materials, supplies or workmanship deemed of inferior quality, or not in accordance with the finally approved specifications, brought to or incorporated in the work may be rejected by the Engineer. The equipment, materials and supplies and workmanship may be re-inspected at any time, prior to delivery to the site of the proposed improvements. The Contractor shall bear all the expense of testing materials.

C. When construction is not continuous through the normal work week (Monday through Friday), Contractor must notify the Engineer at least 24 hours in advance of any stopping or starting of the work. Notification may be by writing, telephone, facsimile, telegraph or personal visit to the Engineer's listed office.

D. Contractor shall notify Engineer at least forty-eight (48) hours in advance to any work on Saturdays. There will be no work permitted on Sundays or holidays. If the project receives inspection by the Engineer, the normal working hours for the Engineers inspector are from 7:30 a.m. to 4:00 p.m., Monday through Friday. Any overtime inspection costs for the Engineers inspector which are avoidable shall be reimbursed by the Contractor.

E. As the Owner is only paying for the contract time in the Contract Documents, the Contractor shall be responsible for all costs of inspection and contract management beyond the contract time limits, unless a written extension of time has been granted by the Owner. These costs are in addition to any liquidated damages that may be charged to the Contractor.

6.02 Daily Reports.

A. Contractor shall furnish a daily report to the Engineer in writing, the form of which report shall be submitted to the Engineer for approval, which shall include a general description of the work performed, dated, weather, number and type of men employed, location of work, and any pertinent remarks affecting the work. The daily report shall also include a Certification of Site Safety Conditions signed by the Contractor's Authorized Representative, the form of which is attached hereto.

6.03 Inspectors.

A. The work shall be conducted under the general observation of the Engineer through such Inspectors as the Engineer employs. Inspectors are stationed on the site of the work to represent the Engineer and to report to the Engineer concerning the observation of progress of the work and the workmanship and materials being furnished. Such Inspectors shall inform the Engineer and the Contractor when they observe that work being performed and/or the materials being furnished do not conform to the requirements of the Contract Documents. Such observation, if and when provided, shall not relieve the Contractor of any responsibility to furnish materials and perform work in complete accordance with the requirements of the Contract Documents, nor does such observation create any duty or obligation to any employee or invitee of Contractor, any Subcontractor, or to any third party.

B. The Inspector is not authorized to revoke, alter, enlarge, relax, or release any requirements of the Contract Documents or to issue instructions contrary to the Contract Documents.

6.04 Office Trailer.

A. When required by the Contract Documents, the Contractor shall furnish and maintain a private office for the Owner or Owners designee with an area not less than 80 square feet which shall have heat, light, a desk, four- drawer locked legal size file, plan rack, 36"x48" drawing table, desk, chair, telephone service and drawing stool. When more than one (1) Contractor is engaged, the office shall be furnished and maintained by the General Contractor.

6.05 Access to the Work.

A. The Contractor shall furnish the Engineer with every reasonable facility for observing the work as performed.

B. The Engineer shall have the right to inspect all work done and all materials furnished either in the field or at the point of manufacture. The Contractor shall furnish or cause to be furnished safe access at all times to the places where preparation, fabrication or manufacture of materials and/or construction of the work is in progress.

C. When the Engineer or their representative are in or about the premises mentioned above in the course of their duties, they shall be deemed conclusively to be an invitee of the Contractor. If the Contractor is not the Owner of the premises mentioned above, the Owner thereof shall be deemed an agent of the Contractor with respect to the obligation assumed hereby. The Contractor or their agent, as described above, shall be liable for the payment of claims for

injuries, damages, etc, for death of the Owner or their representative due to the negligence on the part of the Contractor or their agent.

6.06 Covering Uninspected Work.

A. If any work be buried, covered or otherwise concealed prior to observation by Engineer or contrary to the orders and direction of the Engineer and such work is not subject to testing and approval by any acceptable alternate method it must, if required by the Engineer, be uncovered for examination. Such uncovering and all necessary restoration regardless of the final acceptability of the work uncovered, shall be at the expense of the Contractor.

6.07 Testing Materials.

A. Except as may be provided elsewhere, tests or analysis of materials which are usually tested after delivery to the site, such as concrete aggregate, mixed-in-place concrete, and similar materials; will be performed by the Engineer or testing laboratories which will be approved by the Engineer and selected and paid for by the Contractor. The preliminary testing of concrete mixtures and tests or analysis of other materials, samples of which are to be submitted prior to delivery, will also be performed by the laboratory and paid for by the Contractor at the Engineer's request.

B. If the Engineer orders sampling and analysis or tests of materials which are usually accepted on certification of the manufacturer but which appear defective or not conforming to the requirements of the Specifications, the Contractor will bear the reasonable costs of sampling, transportation, tests and analysis.

7.0 PAYMENTS.

7.01 Construction Schedule and Periodic Estimates.

A. Immediately after execution and delivery of the contract, and before the first partial payment is made, the Contractor shall deliver to the Engineer a completed W-9 Request for Taxpayer Identification Number and Certification, and an estimated construction progress schedule in form satisfactory to the Engineer, showing proposed dates of commencement and completion of each of the various subdivisions of work required under the Contract Documents and the anticipated amount of each monthly payment that will become due to the Contractor in accordance with the progress schedule. The Contractor shall also furnish the Engineer (a) a

detailed estimate giving a complete breakdown of the contract price on Lump Sum Contracts and (b) periodic itemized estimates of work done for the purpose of making partial payments thereon. The costs employed in making up any of these schedules will be used only in determining the basis of partial payments and will not be considered as fixing a basis for additions to or deductions from the contract price.

7.02 Payments.

A. Unless otherwise specified, on the first day of each month or within thirty (30) days thereafter, the Engineer will estimate approximately the value of the work performed, and equipment, materials and supplies delivered on the ground inspected and accepted during the preceding month, according to these specifications, less any retainage, and shall be certified by the Engineer for payment to the Contractor. The value of the work, as estimated, will be determined by the lump sum and/or unit price bid. Requests for payment for materials on hand shall be accompanied with receipted invoice from supplier. Prior to such payment being made, the Contractor shall execute an agreement, provided by the Engineer and Solicitor on behalf of the Owner, which details the conditions of payment.

B. If, in the opinion of the Engineer, it is undesirable to replace any defective or damaged materials or to reconstruct or correct any portion of the work injured or not performed in accordance with the contract documents, the compensation to be paid to the Contractor hereunder shall be reduced by such amount as in the judgment of the Engineer shall be equitable.

C. No request for payment shall be approved until a Certification of Site Safety Conditions showing no unsafe conditions for each day worked in the payment request period has been furnished by the Contractor. When the work performed under this contract has been completed by the Contractor and accepted by the Owner, the Engineer shall make a final estimate of the work and certify the same to the Owner which shall for causes herein specified, pay to the Contractor the balance due, said payment, unless otherwise specified, to be made within thirty (30) days from the date of the final acceptance, excepting therefrom such sum as may be lawfully retained under any provisions of this contract. All prior estimates and payments including those relating to extra work shall be subjected to corrections by this payment.

7.03 Retainage.

A. The Contractor is advised that for contracts for improvement to real property, the sum of 10% of the amount due shall be held on each partial payment pending completion of the project. The provisions of this section provide that the Contractor may:

(1) Agree to the withholding of payments in the manner prescribed in the contract, or may deposit with the contracting unit registered book bonds, entry municipal bonds, State bonds or other appropriate bonds of the State of Maryland, or negotiable bearer bonds or notes of any political subdivision of the State, the value of which is equal to the amount necessary to satisfy the amount that otherwise would be withheld pursuant to the terms of the contract. The nature and amount of the bonds or notes to be deposited shall be subject to approval by the contracting unit. For the purposes of this section, "value" shall mean par value or current market value, whichever is lower.

(2) Such agreement will be indicated by signing of estimate or payment certificates unless written communication to the contrary is made to the Owner and Engineer, or

(3) If the Contractor agrees to the withholding of payments, the amount withheld shall be deposited, with a banking institution or savings and loan association insured by an agency of the Federal Government, in an account bearing interest at the rate currently paid by such institutions or associations on time or savings deposits. The amount withheld, or the bonds or notes deposited, and any interest accruing on such bonds or notes, shall be returned to the contractor upon fulfillment of the terms of the contract relating to such withholding. Any interest accruing on such cash withholdings shall be credited to the Owner.

7.04 Acceptance of Final Payment as Release.

A. The acceptance by the Contractor of final payment shall be and shall operate as a release by the Owner of all claims and all liability to the Contractor other than claims in stated amounts as may be specifically excepted by the Contractor for all things done or furnished in connection with the work and for every act and neglect of the Owner, or Owners designee and others relating to or arising out of this work. Any payment, however, final or otherwise, shall not release the Contractor or its sureties from any obligations under the contract documents or the performance, payment and maintenance bonds.

7.05 Owner’s Right to Withhold Payments.

A. Owner may withhold from the Contractor as much of any approved payments due to them as may, in the judgment of the Owner, be necessary, to

(1) Secure the payment of just claims then due and unpaid by any persons supplying labor or materials for the work.

(2) Protect the Owner from loss due to defective work not remedied, or

(3) Protect the Owner from loss due to injury to persons or damage to the work or property of other Contractors, Subcontractors or others caused by the act or neglect of the Contractor or any of their Subcontractors that the Owner may deem proper to satisfy such claims or to secure such protection. Such application of such money shall be deemed payment for the amount of the Contractor.

(4) Protect the Owner from enforcement action by others or from being in non-compliance with laws or regulations due to the failure of the Contractor to supply the Engineer and or Owner with Monthly Manning Reports, Certified Payroll Reports or other submittals required by the Engineer or Owner.

7.06 Costs of Engineering and Inspection.

A. There will be deducted from the contract and retained by the Owner an amount to defray the cost of wages and overhead paid by the Owner to the Resident Engineer, Inspector or Inspectors employed on the work for any avoidable time in excess of eight (8) hours per day or on Saturdays, Sundays or legal holidays. This amount shall be determined at the rate of the hourly rate contract with the Owner per man hour for each Inspector, or Resident Engineer for, in excess of eight (8) hours per day and at the rate of the hourly rate contract with the Owner per man hour for Saturday, Sunday and Holidays for each Inspector or Resident Engineer.

B. In addition, there will be deducted from the contract and retained by the Owner an amount equal to the cost paid by the Owner to the Engineer, for all inspection and contract administration performed in excess of the completion time stipulated for the contract, or as amended by approved change orders.

7.07 Liens.

A. Final payment of retained percentage shall not become due until the Contractor, if required, shall furnish the Owner a complete release of liens arising out of their contract, or receipts in

full, in lieu thereof covering claims of any kind or character for work or labor done, or labor or materials furnished by the Subcontractor, materialmen, persons or corporations whatsoever.

7.08 Wage Payment Certificate.

A. The form attached hereto, entitled "Wage Payment Certification" shall be executed by the Contractor and submitted with the final voucher prior to final payment, where applicable.

7.09 Certified Payroll Reports.

A. The Contractor shall submit original certified payroll reports within ten (10) days of the payment of wages to the Owner with a copy to the Owners designee, where Prevailing Wages are applicable.

WAGE PAYMENT CERTIFICATION

This form must be executed by Contractor and submitted with final voucher prior to final payment.

PROJECT TITLE: Denton Water Main Replacements

TO: Town of Denton

RE: Contract for Certification of Contractor of Payment of Prevailing Wages to Workmen.

The undersigned Contractor hereby certifies that any and all workmen employed by the undersigned Contractor and all Subcontractors have been paid in full and prevailing wages for their respective crafts or trades as determined and computed by the US Department of Labor, and that all suppliers and material men have been paid in full all amounts claimed by them, and there remains no outstanding claim, lien, or dispute; nor any contingent claim by any of the foregoing.

DATED: _____ CONTRACTOR: _____

(SIGNATURE)

STATE OF MARYLAND

COUNTY OF _____

_____ , being duly sworn according to law, upon his oath disposes and says that they are the _____ (Owner-pres. or authorized agent) of _____ (name of corporation) that they have read the aforesaid statement of certification and knows the content thereof, and that the same is true of their own knowledge and this affidavit is being executed by them.

_____

(SIGNATURE)

Sworn and subscribed to before me this _____ day of _____ 20_____.

_____

Notary Public

CERTIFICATION OF SITE SAFETY CONDITIONS

Project Title: Denton Water Main Replacements

Project Number: MCDNT010

Owner: Town of Denton

I hereby certify that site safety conditions and the means and methods of construction have been and are in accord with the provisions of the Contract Documents and all requirements contained and referenced therein since the last executed Certificate of Site Safety Conditions, except as noted:

☐ Unsafe Trench Condition
☐ Unsafe Entry to Live Manhole
☐ Unsafe Traffic Control
☐ Unsafe Equipment
☐ Inadequate Fall Protection
☐ Proximity to Electric
☐ Other _____

_____

☐ None _____

Comments / Resolutions: _____

_____

_____

Contractor: _____

By: _____

(Authorized Representative)

I execute this form at _____ on _____

Time Date

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SECTION 01000
GENERAL REQUIREMENTS

PART 1 - GENERAL

1.01 General

A. Only major items of work are given in the Bid Form, but it is the intent of the specifications to secure a completely interconnected and functionable system, and should any workmanship or materials be required which are obviously necessary to carry out the full intent and meaning of the plans and specifications or to be reasonably inferred therefrom, the cost of such workmanship or materials shall be included in the items in the bid form.

B. Where construction is being performed in traveled roadways or rights-of-way, the Contractor is to provide all necessary traffic controls and devices in accordance with the current Maryland Department of Transportation standards.

C. The Contractor shall notify all utility companies prior to construction of utilities, curbing and paving.

D. Prior to any excavation, the Contractor shall have all utilities marked and shall excavate or otherwise determine the exact location and elevations of said utilities. The Contractor shall notify the Engineer of any conflicts. The Contractor shall arrange for any necessary utility relocations or field changes and shall reschedule his operations appropriately.

E. The Contractor, in the construction of the project, shall not stockpile materials or store equipment on any private property; except areas designated by the plans or as directed by the Engineer. If so required, the Engineer may direct the Contractor to have equipment removed from any project during weekend hours.

F. All work of refilling sunken ditches, repaving over trenches and keeping streets and sidewalks in passable condition shall be done to the satisfaction of the Owner during the construction of the project as well as during the maintenance period. If any remedial work is not done within three (3) days after written notice is given by the Engineer, the work may be done by the Owner and charged to the Contractor.

G. Special care shall be taken to prevent contamination, siltation, or interference of any kind with the stream flows or ponds along the line of work. No waste matter of any kind will be allowed to discharge into the stream flows or impounded water of any ponds or other bodies of water.

H. The Contractor is to ensure that proper measures for erosion control are employed and provide for the early establishment of vegetation that will help avoid erosion problems during and after construction. It is expected that the Contractor will anticipate possible problems and provide timely and adequate control to prevent or minimize adverse effects.

I. The Contractor shall apply and pay for all permits that may be required for any of the work involved with this project.

J. The Contractor is to notify residents by door-hangers, at least forty-eight (48) hours in advance, before starting construction work that will directly affect their property frontage, driveway(s) and/or on-street parking.

K. All notes on plans shall be made a part of the specifications.

L. The Contractor shall notify the Engineer at least forty-eight (48) hours in advance of any work scheduled for Saturdays. There will be no work permitted on Sundays or holidays. This project will receive full-time inspection and the normal working hours for the Inspector are from 7:00 AM to 3:30 PM, Monday through Friday. Any overtime inspection costs which are avoidable will be reimbursed by the Contractor.

M. During the construction phase of the project, travel lanes shall remain open at the end of each day.

N. The Contractor shall take extreme care in the placement of the asphaltic tack coat so as to not make it visible on the concrete curb or inlet top units. It shall be the Contractor's responsibility to keep the concrete curb and inlet top units clean of this material.

O. Separate payment will not be made for construction layout. The costs for construction layout for all site work shall be included in the various items of the proposal.

1.02 Public Utilities

A. The Contractor is required to ascertain all the facts concerning the location of utilities.

B. The Contractor shall cooperate with the utility Owners in the adjustment of their facilities and shall notify the utility Owners not less than ten (10) days in advance of the time scheduled to perform any work that will impact or affect their facilities.

C. The Contractor shall permit the Owners of utilities, or their agents, access to the site of the work at all times in order to relocate, construct or protect their lines and he shall cooperate with them in performing this work.

D. Separate payments will not be made for the coordination and cooperation of the Contractor with the utility companies, nor for the protection or replacement of utilities as specified hereinbefore and the bidder shall include all such costs in the prices bid for the various scheduled items in the Bid Form.

1.03 Preconstruction Video

A. The Contractor shall, at no extra cost to the Owner, take DVD video recordings of the site prior to the commencement of construction. The video recording shall accurately depict the existing preconstruction condition of all curbs, sidewalks, driveways, fences, lawns, landscaped area, mailboxes, street furniture and all other appurtenances within, or outside a 25-foot radius of the limits of the construction of the project. Two (2) copies of the video recording shall be provided to the Engineer. The date of the DVD video, as well as identification as to the location which the video depicts must be provided.

1.04 Maintenance and Protection of Traffic

A. The Contractor shall erect or place and maintain in good condition, barricades, warning signs, lights, flares, approved yellow-flashing light units, rubber traffic cones, and other warning and danger signals and devices, appropriate and adequate for the specific needs and subject to the Engineer's approval, at working sites, closed roads, intersections, open excavations, locations of material storage, standing equipment and other obstructions, at points where the usable vehicular or pedestrian traffic width of the road or sidewalk is reduced, at points where traffic is deflected from its normal courses or lanes, and at other places of danger to vehicular or pedestrian traffic.

B. The Contractor shall provide sufficient watchmen and traffic directors and shall take all other precautions, including any that may be ordered by the Engineer, which are necessary for the safety of the public and protection of the work.

C. The Contractor shall obtain the approval of the Engineer and consent of all appropriate authorities having jurisdiction, for any detours which may be required. The Contractor shall make all necessary arrangements with such authorities regarding the establishment, maintenance and repair of such detours, the regulations and direction of traffic thereon, and the installation and maintenance of signs and traffic devices.

D. Before beginning work on any phase of the project, the Contractor shall furnish and install warning signals, barricades, wood traffic guides, lights, flares, and other devices necessary, in the opinion of the Engineer, to protect the public during that phase of his operations.

E. If battery operated flashing warning lights are used, they shall conform to the specifications prepared by The Maryland Department of Transportation, Official Traffic Control Devices.

F. Road construction signs shall be placed at each end of the project along with every connecting intersection. At the start and end of each day, detour signs shall be placed if required.

G. During the work on this project, the Contractor shall provide and/or be prepared to provide traffic protection devices in accordance with the MUTCD. The minimum numbers set forth in the Schedule shall be on hand at each separate project site prior to the commencement of any work (or phase of work) and shall be maintained available on the project site throughout the period of the project (or phase). Failure to provide and maintain the minimum number of devices shall be sufficient cause for the Engineer to order cessation of work. When lack of any required safety devices presents an immediate hazard, the Engineer may order that such devices be provided by the Owner or by other Contractors, deducting the cost thereof from any monies due or becoming due the Contractor lacking the required devices.

H. Additional devices shall be provided by the Contractor as required or directed prior to the commencement of any operation or phase of an operation requiring such devices.

I. Uniform traffic directors (flagpersons) shall be provided whenever alternate two-way traffic is maintained in a single lane, whenever Contractor's operations require closing of a lane or portion of a lane on a multiple lane roadway, whenever the Contractor's equipment or vehicles are entering or leaving active roadways at other than normal street intersections, whenever a Contractor's operations will be contrary to or cause confusion regarding normal traffic control devices (traffic signals, signs, etc.) within a work area and whenever else, in the opinion of the Engineer, the Contractor's operations cause such hazards as to require the use of Traffic Directors.

J. Traffic Directors shall be responsible and thoroughly familiar with their responsibilities, and, while serving as Traffic Directors, shall not be required to perform any other duties. Traffic Directors shall be provided with an orange or red flag, an orange, orange and white, or lime green traffic safety vest and white or orange hard hat or other appropriate head gear. The Contractor may, at his option, secure the services of uniformed policemen having jurisdiction in the locality within which the project is located. Provision of such uniformed policemen will be deemed sufficient in meeting the requirements of this specification.

K. Traffic must be maintained throughout each separate work area during construction. At least one 12' lane must be maintained for traffic during all actual construction periods and at least two 10' lanes must be maintained for traffic at all other times.

L. The Contractor is advised that there may be heavy commuter traffic during the morning from 7:30 AM to 9:00 AM and the afternoon from 3:00 PM to 5:30 PM.

M. Construction shall be so staged to maintain at least one lane for traffic in each direction throughout each separate work area during the morning 7:30 AM to 9:00 AM and the afternoon 3:00 PM to 5:30 PM weekday periods of peak traffic.

N. Any restriction of traffic at any time shall be subject to the approval of the Engineer, and the Town Police Department. Any restriction of traffic on a Maryland State Highway shall be subject to regulations and permitting prescribed by The Maryland Department of Transportation. The Contractor shall submit a schedule of staged construction to the Engineer for approval prior to any restriction of traffic.

O. Should construction be in close proximity to a school or school traffic route, and be commenced during an active school period, the Contractor shall provide open traffic lanes to accommodate school bus and school related traffic.

P. If detours are proposed by the Contractor, they are subject to the review and approval of the Engineer, the Town Police Department and/or The Maryland Department of Transportation, as applicable.

Q. A detour plan and schedule shall be prepared by the Contractor for each proposed detour and submitted to each of the approving agencies previously mentioned. All detour signs shall conform to the requirements for Traffic Control Devices.

R. Temporary traffic stripes will be necessary to control and guide traffic through individual work areas. The Contractor shall submit a scheme for approval by the Engineer of all temporary traffic stripes prior to removal of any existing traffic stripes.

S. Construction of proposed utility pipes or storm pipes across existing roadways shall be so staged to maintain one lane in each direction. Trenches shall not remain open overnight.

T. The Contractor shall provide adequate means of access for fire, police and emergency vehicles throughout the length of the project. Contractor shall also provide for safe and adequate means of access to adjacent properties, both private and public.

U. The cost of all work as specified hereinbefore and all other work required to protect public safety and maintaining traffic flow shall be included in the prices bid for the various items in the Bid Form, unless specifically requested as a bid item in which case payment will be made as a lump sum.

1.05 Reference to the Standard Specifications

A. Portions of the work performed under this contract shall comply with the requirements of the Town of Denton Standard Specifications and Details for Public Works Construction, Maryland Department of Transportation Standard Specifications for Construction and Materials, latest edition, and supplements and the Maryland Department of Transportation Standard Construction Details as applicable and all requirements modified, as amended or supplemented and whose specifications are made part of these specifications.

B. The Standard Specifications are made part of these specifications by this reference as if they were set forth in full. It is the responsibility of the prospective bidder to be familiar with these Standard Specifications.

1.06 Dust Control

A. The Contractor will be required to maintain all excavations, embankments, stockpiles, haul roads, permanent access roads, plant sites, waste areas, borrow areas, and all other work areas within or outside the project boundaries free from dust which would cause a hazard or nuisance to others. Approved temporary methods of stabilization consisting of sprinkling, chemical treatment, light bituminous treatment, or similar methods will be permitted to control dust. Sprinkling, to be approved, must be repeated at such intervals as to always keep all parts of the disturbed area at least damp, and the Contractor must have sufficient competent equipment on the job to accomplish this if sprinkling is used. Dust control shall be performed as the work proceeds and whenever a dust nuisance or hazard occurs. If any dust control is not done within twenty-four (24) hours after written notice is given by the Engineer, the work may be done by the Owner and charged to the Contractor. Costs for dust control shall be included in the prices bid for the various items in the bid form.

1.07 Testing Materials

A. Except as may be provided elsewhere, test or analysis of materials which are usually tested after delivery to the site, such as concrete aggregate, mixed and placed concrete, and similar materials; will be performed by a test laboratory which will be approved by the Engineer and selected and paid for by the Contractor. The preliminary testing of concrete mixtures and test or analysis of other materials, samples of which are to be submitted prior to delivery, will also be performed by the laboratory and paid for by the Contractor.

B. If the Engineer orders sampling and analysis or tests of materials which are usually accepted on certification of the manufacturer, but which appear defective or not conforming to the requirements of the Specifications, the Contractor will bear the reasonable costs of sampling, transportation, test and analysis.

1.08 Test Cores and Core Analysis

A. The Contractor shall be responsible for providing test scores and core analysis of all bituminous concrete surface course and bituminous stabilized leveling and base course items upon completion of these items. Test coring and core analysis shall be performed by a testing laboratory equipped and experienced in performing this work. The testing laboratory shall be approved by the Engineer. Coring and core analysis shall be performed in strict compliance with the Maryland Department of Transportation Standard Specifications for Construction and Materials.

1.09 Mobilization

A. DESCRIPTION—This work is the assembly and set-up of the general plant required to comply with the contract and with local and State laws and regulations. General plant includes Contractor's offices, shops, plants, storage areas, and sanitary or other facilities. This work includes obtaining the required permits, insurance, bonds, and any other initial items required for the start of the work.

B. MATERIAL—These material and furnishings will not be considered a part of the other completed contract items.

(a) Mobilization shall be performed in strict compliance with Maryland Department of Transportation Standard Specifications for Construction and Materials.

PART 2 – PRODUCTS

Not Used

PART 3 – EXECUTION

Not Used

PART 4 – QUANTITY AND PAYMENT

4.01 Maintenance and Protection of Traffic

A. Quantity of “Maintenance and Protection of Traffic” will not be measured for this project but shall be bid as a lump sum (LS) as shown on the bid form.

B. Payment for “Maintenance and Protection of Traffic” will be made at a percentage of the lump sum (LS) amount bid. The percentage estimated for each payment application

shall be proportional to the dollar amount of the contract completed for that payment period.

4.02 Mobilization

A. Quantity of "Mobilization (2.5% of Bid or Up To Max of $50,000)" will not be measured for this project.

B. Payment for "Mobilization (2.5% of Bid or Up To Max of $50,000)" will be made as a lump sum (LS). Payment for Mobilization will be recommended after a Performance Bond has been secured, all necessary permits have been obtained, all submittals have been approved, Notice to Proceed has been issued, and the physical work has commenced. Payment for Mobilization will only be made once. No additional payment will be made for remobilization.

4.03 Two Year Maintenance Bond

A. Quantity of "Two Year Maintenance Bond" will not be measured for this project.

B. Payment for "Two Year Maintenance Bond" will be made as a lump sum (LS). Payment for bond will be recommended after a Maintenance Bond has been secured. Payment for bond will only be made once.

4.04 General Requirements

A. Quantity of all other items covered in the General Requirements will not be measured for this project, but the work shall be performed as incidental to the proposed work.

B. Payment for all other items covered in the General Requirements will not be made for this project, but the cost shall be included in the various items of the proposal.

END OF SECTION

SECTION 01010

SUMMARY OF WORK

PART 1 - GENERAL

1.01 Project Location.

A. The project is located within the Town of Denton (Town) in Caroline County, Maryland.

1. Project Locations:
   a. Sharp Road and S 2nd Street
   b. Legion Road and Foy Road
   c. Market Road
   d. Aldersgate Drive

1.02 Project Description.

A. In general, the work includes, but is not limited to maintenance and protection of traffic, sawcutting, excavation, water main construction, sanitary sewer main construction, sanitary sewer manhole construction, fire hydrant, water services, valves, and appurtenances, all required post-construction testing, trench restoration, temporary pavement restorations, concrete curbing, concrete sidewalk, concrete driveway aprons, concrete curb ramp, landscaping and permanent pavement restorations. The scope of the work is more fully described in the Project Specifications herein and on the Project Plans.

1.03 Work Included.

A. Base Bid.

1. Mobilization.
   a. The contractor shall provide required performance guaranties, permits, construction equipment, portable toilet for workers, staging areas, erosion and sediment controls, temporary barriers, etc. as required to complete the work and as described within the project documents.

2. Maintenance and Protection of Traffic.
   a. The contractor shall provide all maintenance and protection of traffic (MPT) as required for the completion of the Work. MPT shall be provided in accordance with MDOT SHA Standard Specifications for Construction and Materials, and notes shown on the project plans.

   b. For project locations within local streets, the Borough will allow the closure of local streets during the workday to facilitate the Work. The Borough reserves the right to limit or restrict road closures, where doing so would have an unacceptable impact on traffic and / or access to key facilities or activities.

   c. In general, all construction areas shall be reopened to traffic at the end of each workday.

3. Test Pits.
    a. Where directed by the project plans and / or the Engineer, the contractor shall perform test pits. Test pits shall include maintenance and protection of traffic, sawcutting, excavation, recording information, backfilling, and temporary pavement restorations.

4. New Water Mains.
    a. The contractor shall install new water mains in accordance with the project plans and specifications. In general, this work includes, but is not limited to, the following major items:
        1. Install new water main piping.
        2. Install all fittings, valves, wet taps, appurtenances, fire hydrants, water services and interconnections of new water main into existing distribution lines as indicated on the drawings.
        3. Cut and cap existing water lines to be abandoned in place.
        4. Temporary pavement restoration of work.
        5. Provide testing and disinfection of water mains.

    b. Contractor shall provide all equipment, labor & materials to perform the installation work including final testing.

    c. At the end of each workday the contractor shall install temporary pavement restorations and make the street suitable for public use. No separate payment will be made for the installation of temporary pavement restorations.

        1. Temporary pavement restorations shall be installed in accordance with the details shown on the project plans. The contractor shall follow the temporary pavement restoration detail for local streets or State right-of-way, as applicable to each project location.

        2. Within local streets only, cold patch material may be used on a temporary basis until temporary pavement restorations are installed. Cold patch material shall remain in place no longer than one (1) week before being replaced with temporary pavement restorations.

5. New Sewer Mains.
    a. The contractor shall install new water mains in accordance with the project plans and specifications. In general, this work includes, but is not limited to, the following major items:
        1. Install new sewer main laterals.
        2. Installing new sanitary sewer manholes
        3. Manhole penetration
        4. Includes excavation, Stone Bedding & Backfill, All Connections, All Fittings, Testing Complete
        5. Temporary pavement restoration of work.

    b. Contractor shall provide all equipment, labor & materials to perform the installation work including final testing.

    c. At the end of each workday the contractor shall install temporary pavement restorations and make the street suitable for public use. No separate payment will be made for the installation of temporary pavement restorations.

1. Temporary pavement restorations shall be installed in accordance with the details shown on the project plans. The contractor shall follow the temporary pavement restoration detail for local streets or State right-of-way, as applicable to each project location.

Within local streets only, cold patch material may be used on a temporary basis until temporary pavement restorations are installed. Cold patch material shall remain in place no longer than one (1) week before being replaced with temporary pavement restorations

6. Hydrants.
   a. The contractor shall install a new fire hydrant in accordance with the project plans and specifications. After installation and testing of the new hydrant, the adjacent existing hydrant shall be removed from the site to a location of the Town's choice.

7. New Water and Sewer Services.
   a. The contractor shall install new water and sewer services in accordance with the project plans and specifications.

8. Concrete Work.
   a. Where required to facilitate other contract work, the contractor shall remove and replace portions of existing concrete curb, concrete sidewalk, and concrete driveway aprons.

   b. Where required to facilitate other contract work, the contractor shall install concrete curb ramps. Concrete curb ramps shall be installed complete with detectable warning surface, as shown on the details in the project plans.

   c. Where required to facilitate other contract work, the contractor shall remove and replace portions of existing concrete with concrete pavement patch.

9. Permanent Pavement Restorations.
   a. Excavation of Temporary Pavement Restorations.
      1. Within local roads, the contractor shall remove all temporary pavement restoration and backfill materials to a depth of six inches (6") from the surrounding pavement surface.
      2. Within State Right-of-Way areas, the contractor shall extend the area for permanent pavement restorations by sawcutting one foot (1') beyond the edge of the temporary pavement restorations; and the contractor shall remove existing pavement (including bituminous and concrete pavements), temporary pavement restoration and backfill materials to a depth of nine inches (9") from the surrounding pavement surface.
   b. Once the permanent pavement restoration areas have been excavated, the contractor shall sawcut and remove any additional compromised pavement or subbase materials along the perimeter of the permanent pavement restoration areas.
   c. The contractor shall properly transport and dispose of all materials removed.
   d. Installation of Permanent Pavement Restorations.
      1. Within local roads, the contractor shall install six inches (6") of permanent pavement restorations even with the surrounding pavement surface.

Permanent pavement restorations within local streets shall be installed in accordance with the detail shown on the project plans.

2. Within State Right-of-Way areas, the contractor shall install nine inches (9") of permanent pavement restorations even with the surrounding pavement surface. Permanent pavement restorations in the State Right-of-Way area shall be installed in accordance with the detail shown on the project plans.

e. The contractor shall replace all existing striping in kind.

10. Record Drawings.

a. Upon completion of the Work, the contractor shall provide the Borough with record drawings in accordance with the project specifications. The contractor shall record information for the record drawings throughout the performance of the Work to ensure that final record drawing information is complete and accurate.

1.04 General Requirements

A. All work by the Contractor must be 100% complete within the contract day limit specified.

B. All related incidental work, dust control, erosion control, flow diversion, cleaning and restoration shall be included in the contract bid price. These activities are not separate pay items and shall be included in the overall cost of the project.

C. All materials, construction procedures, type and use of equipment, measurement and payment shall be in accordance with MDOT SHA Standard Specifications for Construction and Materials unless otherwise noted and/or added into these specifications.

D. The Contractor is responsible for construction layout of this project. The Contractor shall forward all construction layout survey information to the Engineer for reference including benchmarks, stationing, and elevations.

E. All contractors and other persons utilizing this specification and the information contained herein are cautioned to comply with the requirements of the Maryland Public Utility Companies Section 12. Each individual contractor using the project plans must verify the location and depth of all underground utilities and facilities before starting work. The contractor shall notify "Miss Utility" (1-800-282-8555) at least 72 hours prior to the start of any excavation.

F. All paved and concrete areas disturbed during construction shall be restored to a condition at least equal to that which existing prior to the start of construction.

G. All grassed areas disturbed during construction shall be topsoiled, fertilized and seeded. No additional payment will be made for restoration of grassed areas, but the cost shall be included in the various items of the proposal.

H. The contractor shall be responsible for the location and preservation of underground and surface utilities and structures at or adjacent to the site of construction and it shall be at his own expense to repair or replace anything that is damaged.

I. All construction details not shown shall be in accordance with MDOT SHA Standard Specifications for Construction and Materials.

J. Payment for joint material and sealant for all concrete work will not be measured but shall be included in the various items of the proposal.

K. Payment will not be made for sawcutting but shall be included in the various items of the proposal.

L. Payment for the excavation of rock if encountered will be measured on a cubic yard basis. Rock to be measured for additional payment is defined in Section 02227, "Excavation and Backfill". Rock excavation will not be measured without prior authorization from Owner to deploy a machine equipped with a hydraulic rock hammer.

M. No payment will be made for remobilization for any reason including weather conditions.

1.05 Payment Item

A. Quantity of "Furnish and Install 8-Inch PVC Sewer Main, Including Excavation, Stone Bedding & Backfill, Graded Aggregate Base Course, Asphalt Base Course, and Temporary Surface Course, All Connections, All Fittings, Testing, Complete" will be measured per linear foot (LF) installed. No distinction will be made between SDR-35 and SD- 26. All PVC Sanitary Sewer Piping will be SDR-35, unless an alternative SDR is specifically referenced on the plans.

B. Payment for sanitary sewer main installation will be made on a per linear foot basis for the item "Furnish and Install 8-Inch PVC Sewer Main, Including Excavation, Stone Bedding & Backfill, Graded Aggregate Base Course, Asphalt Base Course, and Temporary Surface Course, All Connections, All Fittings, Testing, Complete" on the Bid Form. Work includes all materials, labor, and equipment, including transportation, tools, supplies and appurtenances necessary for the construction of the water mains, and all else necessary therefore and all other work in connection therewith and incidental thereto to complete the work specified within this section and on the plans. Payment shall only be made for piping lengths that are put into operation on this project.

C. Quantity of "Furnish and Install 12-Inch PVC Sewer Main, Including Excavation, Stone Bedding & Backfill, Graded Aggregate Base Course, Asphalt Base Course, and Temporary Surface Course, All Connections, All Fittings, Testing, Complete" will be measured per linear foot (LF) installed. No distinction will be made between SDR-35 and SD- 26. All PVC Sanitary Sewer Piping will be SDR-35, unless an alternative SDR is specifically referenced on the plans.

D. Payment for sanitary sewer main installation will be made on a per linear foot basis for the item "Furnish and Install 12-Inch PVC Sewer Main, Including Excavation, Stone Bedding & Backfill, Graded Aggregate Base Course, Asphalt Base Course, and Temporary Surface Course, All Connections, All Fittings, Testing, Complete" on the Bid Form. Work includes all materials, labor, and equipment, including transportation, tools, supplies and appurtenances necessary for the construction of the water mains, and all else necessary therefore and all other work in connection therewith and incidental thereto to complete the work specified within this section and on the plans. Payment shall only be made for piping lengths that are put into operation on this project.

E. Quantity of “Furnish and Install Sanitary Sewer Manhole, Including Excavation, Stone Bedding & Backfill, Graded Aggregate Base Course, Asphalt Base Course, and Temporary Surface Course, All Connections, All Fittings, Testing, Complete” will be measured for each (EA) individual penetration.

F. Payment for “Furnish and Install Sanitary Sewer Manhole, Including Excavation, Stone Bedding & Backfill, Graded Aggregate Base Course, Asphalt Base Course, and Temporary Surface Course, All Connections, All Fittings, Testing, Complete” will be made per unit price on the Bid Form. Work includes all materials, labor, and equipment, including transportation, tools, supplies and appurtenances necessary for the construction of the water mains, and all else necessary therefore and all other work in connection therewith and incidental thereto to complete the work specified within this section and on the plans.

G. Quantity of “Connection to Existing Manhole” will be measured for each individual connection.

H. Payment for “Connection to Existing Manhole” will be made for each pit, if and where directed by the Engineer, and shall include all maintenance and protection of traffic, sawcutting, excavation, measurements and recording, backfill, and temporary pavement restorations.

I. Quantity of “Furnish and Install 6" PVC Sewer Service Lateral, Including Wye, Cap, Excavation, Stone Bedding & Backfill, Graded Aggregate Base Course, Asphalt Base Course, and Temporary Surface Course, All Connections, All Fittings, Testing, Complete” will be measured per linear foot (LF) installed.

J. Payment for sanitary sewer lateral installation will be made on a per linear foot basis for the item “Furnish and Install 6" PVC Sewer Service Lateral, Including Wye, Cap, Excavation, Stone Bedding & Backfill, Graded Aggregate Base Course, Asphalt Base Course, and Temporary Surface Course, All Connections, All Fittings, Testing, Complete” on the Bid Form. Work includes all materials, labor, and equipment, including transportation, tools, supplies and appurtenances necessary for the construction of the water mains, and all else necessary therefore and all other work in connection therewith and incidental thereto to complete the work specified within this section and on the plans. Payment shall only be made for piping lengths that are put into operation on this project.

K. Quantity of “Furnish and Install 8-Inch C900 Water Main, Including Excavation, Stone Bedding & Backfill, Graded Aggregate Base Course, Asphalt Base Course, and Temporary Surface Course, All Connections, All Fittings, Joint Restraint, Thrust Blocks, Pressure Testing And Disinfection, Complete” will be measured per linear foot (LF) installed.

L. Payment for water main installation will be made on a per linear foot basis for the item “Furnish and Install 8-Inch C900 Water Main, Including Excavation, Stone Bedding & Backfill, Graded Aggregate Base Course, Asphalt Base Course, and Temporary Surface Course, All Connections, All Fittings, Joint Restraint, Thrust Blocks, Pressure Testing And Disinfection, Complete” on the Bid Form. Work includes all materials, labor, and equipment, including transportation, tools, supplies and appurtenances necessary for the

construction of the water mains, and all else necessary therefore and all other work in connection therewith and incidental thereto to complete the work specified within this section and on the plans. Payment shall only be made for piping lengths that are put into operation on this project.

M. Quantity of "Furnish and Install 8-Inch Gate Valve And Box, Including Excavation, Stone Bedding & Backfill, Graded Aggregate Base Course, Asphalt Base Course, and Temporary Surface Course, All Connections, All Fittings, Joint Restraint, Thrust Blocks, Pressure Testing And Disinfection, Complete" will be measured per valve including appurtenances.

N. The payment of "Furnish and Install 8-Inch Gate Valve And Box, Including Excavation, Stone Bedding & Backfill, Graded Aggregate Base Course, Asphalt Base Course, and Temporary Surface Course, All Connections, All Fittings, Joint Restraint, Thrust Blocks, Pressure Testing And Disinfection, Complete" will be made per the unit price stated in the contract. Included with the payment for the valves shall be all sawcutting, excavation, backfill, temporary pavement restorations, furnishing and installation of the valve and appurtenances, testing, valve box, valve position indicated and all restoration.

O. Quantity of "Furnish and Install 12-Inch C900 Water Main, Including Excavation, Stone Bedding & Backfill, Graded Aggregate Base Course, Asphalt Base Course, and Temporary Surface Course, All Connections, All Fittings, Joint Restraint, Thrust Blocks, Pressure Testing And Disinfection, Complete" will be measured per linear foot (LF) installed.

P. Payment for water main installation will be made on a per linear foot basis for the item "Furnish and Install 12-Inch C900 Water Main, Including Excavation, Stone Bedding & Backfill, Graded Aggregate Base Course, Asphalt Base Course, and Temporary Surface Course, All Connections, All Fittings, Joint Restraint, Thrust Blocks, Pressure Testing And Disinfection, Complete" on the Bid Form. Work includes all materials, labor, and equipment, including transportation, tools, supplies and appurtenances necessary for the construction of the water mains, and all else necessary therefore and all other work in connection therewith and incidental thereto to complete the work specified within this section and on the plans. Payment shall only be made for piping lengths that are put into operation on this project.

Q. Quantity of "Furnish and Install 12-Inch Gate Valve And Box, Including Excavation, Stone Bedding & Backfill, Graded Aggregate Base Course, Asphalt Base Course, and Temporary Surface Course, All Connections, All Fittings, Joint Restraint, Thrust Blocks, Pressure Testing And Disinfection, Complete" will be measured per valve including appurtenances.

R. The payment of "Furnish and Install 12-Inch Gate Valve And Box, Including Excavation, Stone Bedding & Backfill, Graded Aggregate Base Course, Asphalt Base Course, and Temporary Surface Course, All Connections, All Fittings, Joint Restraint, Thrust Blocks, Pressure Testing And Disinfection, Complete" will be made per the unit price stated in the contract. Included with the payment for the valves shall be all sawcutting, excavation, backfill, temporary pavement restorations, furnishing and installation of the valve and appurtenances, testing, valve box, valve position indicated and all restoration.

S. Quantity of “Furnish and Install Fire Hydrant Including Excavation, Stone Bedding & Backfill, Graded Aggregate Base Course, Asphalt Base Course, and Temporary Surface Course, All Connections, All Fittings, Joint Restraint, Thrust Blocks, Pressure Testing And Disinfection, Tee, Gate Valve, And Fittings, Complete” will be measured per hydrant assembly installed.

T. Payment for “Furnish and Install Fire Hydrant Including Excavation, Stone Bedding & Backfill, Graded Aggregate Base Course, Asphalt Base Course, and Temporary Surface Course, All Connections, All Fittings, Joint Restraint, Thrust Blocks, Pressure Testing And Disinfection, Tee, Gate Valve, And Fittings, Complete” will be made per the unit price listed in the contract. The cost shall include but not be limited to sawcutting, excavation, backfill, temporary pavement restorations, furnishing and setting of 6" connecting pipe with gate valve and valve box, tie rods, furnishing and setting of hydrant, hydrant anchoring tee supporting wedging, jointing and jointing materials, shoring, testing, pumping, sterilization, replacement of all curb and sidewalk disturbed by construction, and all labor, materials, and equipment and all else necessary therefore and all other work in connection therewith or incidental thereto.

U. Quantity of “Furnish and Install 1.5" I.P.S. Water Service, Including Tap, Corp Stop, Meter Pit, Excavation, Stone Bedding & Backfill, Graded Aggregate Base Course, Asphalt Base Course, and Temporary Surface Course, All Connections, All Fittings, Testing, Complete” will be measured per linear foot (LF) installed.

V. Payment of “Furnish and Install 1.5" I.P.S. Water Service, Including Tap, Corp Stop, Meter Pit, Excavation, Stone Bedding & Backfill, Graded Aggregate Base Course, Asphalt Base Course, and Temporary Surface Course, All Connections, All Fittings, Testing, Complete” which price shall include all labor, material and equipment, tapping into the main; installation of a new service clamp and corporation stop; installation of new 1.5” I.P.S. service line from the corporation stop to the curb stop; installation of a new curb stop and box, complete with all connections and fittings to connect the new line to the existing service. This item of work shall also include all sawcutting, excavation, backfill and temporary pavement restorations required to complete the installation of the service line as described above.

W. Quantity of “Asphalt Milling, 2” Thick” will be measured in square yards (SY) for the total area milled to the specified depth.

X. Payment for “Asphalt Milling, 2” Thick” will be made per square yard (SY). Payment shall include milling equipment, labor, and the removal and proper disposal of milled material.

Y. Quantity of “Bituminous Surface Treatment, 2” Thick” will be measured in Square Yards (SY) of area installed at the specified compacted thickness.

Z. Payment for “Bituminous Surface Treatment, 2” Thick” will be made per Square Yard (SY), and shall include preparation, material, placement, compaction, joint sealing, restorations and incidental work.

AA. Quantity of “Plain Concrete Driveway Apron” will be measured in square yards (SY) for the actual area of concrete driveway apron constructed.

BB. Payment for “Plain Concrete Driveway Apron” will be made per square yard (SY), and shall include construction layout, excavation, removal and disposal of existing material, subgrade preparation, stone subbase, formwork, concrete and concrete reinforcement as applicable, pouring and finishing concrete, wire mesh reinforcement material, expansion material, white pigmented curing compound, restorations and incidental work.

CC. Quantity of “Plain Concrete Curb” will be measured in Linear Feet (LF).

DD. Payment for “Plain Concrete Curb” will be made per linear foot. The contractor shall replace Curb as necessary, and shall include construction layout, sawcutting existing concrete and bituminous surfaces, excavation, subgrade preparation, stone subbase, placement of forms, expansion joint material, pouring and finishing concrete, white pigmented curing compound, backfilling, roadway reconstruction, restoration, power washing, and incidental work.

EE. Quantity of “Plain Concrete Sidewalk” will be measured in square yards (SY) for the actual area of sidewalk constructed. Plain concrete sidewalk includes all sidewalk constructed outside the limits of the handicapped ramps shown on the project plans, including transitions to resident walkways.

FF. Payment for “Plain Concrete Sidewalk” will be made per square yard (SY), and shall include all materials, labor and equipment necessary to perform construction layout, excavation, subgrade preparation, formwork, stone subbase, expansion joint material, pouring and finishing concrete, white pigmented curing compound, protection, backfill, restorations, and incidental work.

GG. Quantity of “Test Pits (if and where directed)” will be measured for each individual pit.

HH. Payment for “Test Pits (if and where directed)” will be made for each pit, if and where directed by the Engineer, and shall include all maintenance and protection of traffic, sawcutting, excavation, measurements and recording, backfill, and temporary pavement restorations.

II. Quantity of "Concrete Encasement, If and Where Directed" for concrete encasement of ductile iron pipe will be measured per cubic yard (CY).

JJ. Payment for "Concrete Encasement, If and Where Directed" will be made at the cubic yard (CY) price bid and shall include all labor, materials, sawcutting, excavation, backfill, temporary pavement restoration, and all other necessary appurtenances for a complete functioning system.

KK. As a minimum, all contract bid prices shall include, all labor, equipment, materials, testing, transportation, tools, supplies and appurtenances necessary for the construction of the water mains and services piping including the cost of excavating, dewatering, laying, assembling, and jointing of the pipe, related equipment and appurtenances complete,

shoring, pumping, backfilling, concrete thrust blocks, joint restraints, pipe supports, bedding, cutting, temporary service establishment, testing, sterilizing and all else necessary to have a complete and operable distribution system.

END OF SECTION

SECTION 01020

RECORD DRAWINGS

PART 1 - GENERAL

1.01 Summary

A. This section consists of the requirements for preparing and delivering record drawings.

B. This section describes only the minimum requirements for record drawings. Other contract sections may impose additional requirements on record drawings and documents and the more stringent requirements must be followed.

1.02 Definitions

A. Record Drawings. Record drawings consist of the collective plans, details, forms and other documents which have been annotated to describe the actual location of constructed improvements.

1.03 Record Plans.

A. The Contractor shall be responsible for maintaining accurate records of all improvements as the project progresses.

B. All elevations, angles and measurements used for record drawings shall be obtained by the Contractor according to the standard practices of the surveying profession.

C. All elevations used for record drawings shall be based on the project benchmarks designated on the project plans. If all project benchmarks have been compromised or removed, then the Contractor shall notify the Engineer to establish an acceptable benchmark.

D. Record Drawing Tolerances.
1. Measured horizontal (±0.10 feet) and vertical (±0.05 feet) locations of underground utilities and appurtenances, referenced to permanent surface improvements.
2. Measured locations of internal utilities and appurtenances concealed in construction, referenced to visible and accessible features of the Work.
3. Field changes of dimension and detail.

E. Record Drawing Formatting.
1. PDF. Record drawings may be developed electronically using a PDF of the original project plans overlaid with as-built information. Record information must be clearly and accurately depicted in red. The Contractor shall provide (1) electronic copy and (1) hard copy to the Engineer.
2. CAD. Record Drawings may be developed using computer automated drafting (CAD) software. Upon request, the Engineer may provide the Contractor with design CAD files for the purpose of developing record drawings. Record information must be placed on a separate layer within the CAD model. The Contractor shall provide (1) electronic copy and (1) hard copy to the Engineer.

1.04 Record Details or Shop Drawings.

A. The Contractor shall provide accurate record details and/or shop drawings to describe any work that was not completed according to the details shown on either the project plans or in referenced standards.

1.05 Piped Underground Utilities (e.g. storm sewer, sanitary sewer, water, gas).

A. Actual size, type, and length of each pipe segment.

B. Actual size and type of each fitting, bend, and valve. Information shall include the type of each valve or fitting and the degree of each bend.

C. Actual invert elevations at each structure (including invert elevations in and out), actual invert elevations at each bend, actual grate and/or rim elevations, and high and low points. In general, the contractor shall verify each design elevation shown on the project plans and indicate on the record plan any actual elevation which deviates from the corresponding design elevation.

D. At each fitting, bend and valve, horizontal dimensions shall be provided to three permanent surface features.

1.06 Electrical/Communication.

A. Actual size, type and depth of each conduit, duct bank or cable, including empty conduits or duct banks, as well as the location of any hand holes, pull boxes or junction boxes.

1.07 Curb Ramps.

A. The requirements for recording distances, slopes and cross-slopes for curb ramps are based on requirements from the State Department of Transportation or the local municipality, depending on whether or not a curb ramp is located within a State Right-of-Way. The requirements for recording actual curb ramp measurements are separate and distinct from the construction requirements for curb ramps (see applicable construction details and specifications for the construction of curb ramps).

B. State Right-of-Way: The Contractor shall provide all actual measured distances, slopes and cross-slopes at all points of interest on newly constructed curb ramps, as necessary to complete curb ramp inspection forms and verification for the State Department of Transportation. The measurements and slopes shall be taken at each of the locations shown on the State Department of Transportation curb ramp inspection form for each individual curb ramp and may include taking measurements and slopes on the surrounding sidewalk areas and on the cartway surface.

C. Local Right-of-Way: The Contractor shall provide actual measured distances, slopes and cross-slopes for all curb ramp surfaces, including the ramp, side flares and turning spaces.

1.08 Building Construction.

A. Actual installation shall be indicated with all installed items clearly identified. Location of installed items and any deviations from contract documents shall be so shown with boxes around the actual numbers or labels.

B. Actual finished floor elevation.

1.09 Record Drawings Verification.

A. After record drawings and documents have been delivered to the Engineer, the Owner or the Engineer may make a written request to the Contractor for verification of any aspect of the record drawings and documents.

B. Upon receipt of a written request for verification of any aspect of the record drawings, the Contractor shall take measurements, take photographs, and create field sketches, as may be required by the Owner to verify the record drawings. This work may include digging test pits and making necessary restorations.

C. If the Contractor fails to complete record drawing verification to the satisfaction of the Owner or within a timely manner, then the Owner may direct the Engineer or an independent third party to perform record drawing verification work. The costs associated with record drawing verification work may be deducted from payment for other work completed by the Contractor.

PART 2 - QUANTITY AND PAYMENT

2.01 Record Drawings.

A. Quantity of "Record Drawings" will not be measured for this project.

B. Payment for "Record Drawings" will be made as a Lump Sum (LS). Payment for Record Drawings will be made after all record drawings and documents have been delivered to the Engineer and have been accepted by the Engineer. Payment for record drawings will only be made once. There will be no additional payment for record drawings associated with change order work.

END OF SECTION

SECTION 01300

SUBMITTALS

PART 1 GENERAL

1.0 SECTION INCLUDES

1.1 References

1.2 Submittal procedures

1.3 Construction progress schedules

1.4 Proposed Products List

1.5 Product Data

1.6 Shop Drawings

1.7 Samples

1.8 Design data

1.9 Test reports

1.10 Certificates

1.11 Manufacturers' instructions

1.12 Manufacturers' field reports

1.13 Erection drawings

1.1 REFERENCES

A. AGC (Associated General CONTRACTORS of America) publication "The Use of CPM in Construction - A Manual for General Contractors and the Construction Industry".

1.2 SUBMITTAL PROCEDURES

A. Transmit each submittal with ENGINEER accepted transmittal form.

B. Number each submittal. Number shall consist of the following parts, each separated by a dash.

1. Contract number

2. Five-digit Specification Section number

3. Two-digit sequence number starting for each Specification Section with 01 and continuing with 02, 03, etc., for subsequent submittals with the same Specification Section number.

4. Use the fourth part of the number only for re-submittals. For the first re-submittal of a previous submittal, add -R1 to the previous number. For the second re-submittal, change to –R2, and so on.

   As an example of the numbering process for Contract Number 1, the third submittal under Section 03300 would be numbered 1-03300-03 and the second re-submittal of this same submittal would be numbered 1-03300-03-R2.

C. Identify project, CONTRACTOR, Subcontractor, equipment/material description, equipment/material supplier, pertinent drawing and detail number, and specification section number, as appropriate.

D. Apply CONTRACTOR'S stamp, signed or initialed certifying that review, approval, verification of products required, field dimensions, adjacent construction work, and coordination of information is in accordance with the requirements of the work and Contract Documents.

E. Schedule submittals to expedite the project and deliver to ENGINEER at business address. Coordinate submittal of related items.

F. For each submittal for review, allow fifteen (15) days excluding delivery time to and from the CONTRACTOR.

G. Identify deviations from Contract Documents and Product or system limitations which may be detrimental to successful performance of the completed Work.

H. Provide space for CONTRACTOR and ENGINEER review stamps.

I. When revised for re-submittal, identify all changes made since previous submittal.

J. The ENGINEER'S approval of the CONTRACTOR'S submittal is for general conformance with the design concept only. Although the ENGINEER may review submittals in more or less detail, such reviewing is an effort to discover errors and omissions in the CONTRACTOR'S submittals and to safeguard the OWNER from unnecessary costs and delays resulting from errors or omissions in the CONTRACTOR'S submittals. The ENGINEER'S review shall in no way relieve the CONTRACTOR of his obligation and responsibility to coordinate the WORK and plan the details of the WORK or to relieve him of his responsibility in fulfilling the purpose and intent of the CONTRACT. Review by the

ENGINEER shall not be construed as placing on him or on the OWNER any responsibility for the accuracy, proper fit, functioning or performance of any phase of the WORK included in the CONTRACT.

K. For all re-submittals except the first, ENGINEER and ENGINEER'S consultants will record man-hours required for review of the re-submittal. At the discretion of the OWNER, CONTRACTOR may be charged for review of such repeat re-submittals at ENGINEER'S (and ENGINEER'S consultant's) current hourly rates. Charges for repeat re-submittals will be subtracted from CONTRACTOR'S next progress payment.

L. Distribute copies of reviewed submittals to all affected parties (other prime contractors). Instruct parties to promptly report any inability to comply with requirements.

M. Provide a record copy of reviewed submittals in the appropriate electronic format as specified in individual paragraphs below.

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

1.3 CONSTRUCTION PROGRESS SCHEDULES

A. Submit initial schedule in duplicate within fifteen (15) days after date of OWNER/ CONTRACTOR Agreement.

B. Revise and resubmit as required.

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

D. Submit a CPM construction schedule with separate task for each major portion of Work or operation identifying first workday of each week.

E. Show complete sequence of construction by activity, identifying Work of separate stages and other logically grouped activities. Indicate the early and late start, early and late finish, float dates, and duration.

F. Indicate estimated percentage of completion for each item of Work at each submittal.

G. Indicate submittal dates required for shop drawings, product data, samples, and product delivery dates, including those furnished by OWNER and required by Allowances.

1.4 PROPOSED PRODUCTS LIST

A. Within ten (10) days after date of OWNER/CONTRACTOR Agreement submit list of major products proposed for use, with name of manufacturer, trade name, and model number of each product.

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

1.5 PRODUCT DATA

A. Product Data for Review:

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

2. After review, provide copies and distribute in accordance with submittal procedures article above.

B. Product Data for Information:

1. Submit for the Engineer's knowledge as contract administrator or for the OWNER.

C. Product Data for Project Closeout:

1. Submit for the OWNER'S benefit during and after project completion.

D. Mark each copy to identify applicable products, models, options, and other data.

E. Supplement manufacturer's standard data to provide information specific to this Project.

F. Indicate Product utility and electrical characteristics, utility connection requirements, and location of utility outlets for service for functional equipment and appliances.

G. Submittal Process Procedure and Required Copies

1. CONTRACTOR shall submit one (1) preliminary copy of each submittal by email to ENGINEER.

2. ENGINEER will review and issue comments and review status via email or mail.

3. When resubmittals are required, the CONTRACTOR shall resend one (1) resubmittal copy by email to ENGINEER for re-review.

4. Once the submittal or resubmittal is approved by ENGINEER the CONTRACTOR shall return four (4) copies of said submittal(s) to the ENGINEER.
    a. one (1) will be retained by the ENGINEER
    b. one (1) will be a field copy for the Inspector
    c. two (2) will be given to the OWNER

5. The Contractor shall provide and retain additional copies for their use, as necessary,

at no additional cost to the OWNER.

H. Provide a record copy of all reviewed submittals in .tif, .pdf or Microsoft Word format on a CD. Electronic format record copies shall be provided for all major items of mechanical/process equipment.

1.6 SHOP DRAWINGS

A. Shop Drawings for Review:

1. Submit to ENGINEER for review for the limited purpose of checking for conformance with information given and the design concept expressed in the contract documents.

2. After review, produce copies and distribute in accordance with Submittal Procedures article above.

B. Shop Drawings for Information:

1. Submit for the ENGINEER'S knowledge as contract administrator or for the OWNER.

C. Shop Drawings for Project Closeout:

1. Submitted for the OWNER's benefit during and after project completion.

D. Indicate special utility and electrical characteristics, utility connection requirements, and location of utility outlets for service for functional equipment and appliances.

E. Provide a record copy of selected reviewed submittals in .tif, .pdf or AutoCAD R2000 format on a CD. Electronic format record copies shall be provided for all major items of mechanical/process equipment. Three (3) paper copies of the reviewed submittals shall be submitted as well.

1.7 SAMPLES

A. Samples For Review:

1. Submitted to ENGINEER for review for the limited purpose of checking for conformance with information given and the design concept expressed in the contract documents.

2. After review, produce duplicates and distribute in accordance with submittal procedures article above and for record documents purposes described in Section 01700 - Contract Closeout.

B. Samples For Information:

1. Submitted for the ENGINEER'S knowledge as contract administrator or for the OWNER.

C. Samples For Selection:

1. Submitted to ENGINEER for aesthetic, color, or finish selection by OWNER.

2. Submit samples of finishes from the full range of manufacturers' standard colors, textures, and patterns for OWNER selection.

3. After review, produce duplicates and distribute in accordance with submittal procedures article above.

D. Submit samples to illustrate functional and aesthetic characteristics of the Product, with integral parts and attachment devices. Coordinate sample submittals for interfacing work.

E. Include identification on each sample, with full Project information.

F. Submit the number of samples specified in individual specification sections; one (1) of which will be retained by ENGINEER.

G. Reviewed samples which may be used in the Work are indicated in individual specification sections.

H. Samples will not be used for testing purposes unless specifically stated in the specification section.

1.8 DESIGN DATA

A. Submit for the ENGINEER'S knowledge as contract administrator or for the OWNER.

B. Submit for information for the limited purpose of assessing conformance with information given and the design concept expressed in the Contract Documents.

1.9 TEST REPORTS

A. Submit for the ENGINEER'S knowledge as contract administrator or for the OWNER.

B. Submit test reports for information for the limited purpose of assessing conformance with information given and the design concept expressed in the Contract Documents.

1.10 CERTIFICATES

A. When specified in individual specification sections, submit certification by the

manufacturer, installation/application subcontractor, or the CONTRACTOR to ENGINEER, in quantities specified for Product Data.

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

C. Certificates may be recent or previous test results on material or Product but must be acceptable to ENGINEER.

1.11 MANUFACTURER'S INSTRUCTIONS

A. When specified in individual specification sections, submit printed instructions for delivery, storage, assembly, installation, start-up, adjusting, and finishing, to ENGINEER for delivery to OWNER in quantities specified for product data.

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

1.12 MANUFACTURER'S FIELD REPORTS

A. Submit reports for the ENGINEER'S benefit as contract administrator for the OWNER.

B. Manufacturer's Field Reports shall include, as a minimum, the following information:

1. Name of Field Service Representative

2. Date(s) of site visit

3. Duration of site visit - actual man-hours on-site

4. Name of equipment manufacturer

5. Complete list of equipment inspected and/or started up

6. Description of any problems, unfinished work, required changes, etc. remaining at the conclusion of the site visit

7. Statement that the installation is or is not acceptable to the equipment manufacturer. If the installation is not acceptable, what is required to make it acceptable?

8. Statement that the equipment is or is not operating properly according to the equipment manufacturer. If the equipment is not operating properly, what is required to make it operate properly?

C. Submit report in duplicate within thirty (30) days of observation to ENGINEER for information. Illegible or incomplete reports will be rejected.

D. Submit for information for the limited purpose of assessing conformance with information given and the design concept expressed in the contract documents.

1.13 ERECTION DRAWINGS

A. Submit drawings for the ENGINEER'S benefit as contract administrator or for the OWNER.

B. Submit for information for the limited purpose of assessing conformance with information
given and the design concept expressed in the contract documents.

C. Data indicating inappropriate or unacceptable work may be subject to action by the ENGINEER or OWNER.

PART 2 PRODUCTS

Not Used.

PART 3 EXECUTION

Not Used.

END OF SECTION

SECTION 01600

TESTING PROCEDURE FOR PUBLIC WATER SUPPLY SYSTEMS

PART 1 – GENERAL

1.01 OBJECTIVE

This procedure establishes the methods which are to be used for the testing of public water supply systems.

1.02 PURPOSE

The purpose of this procedure is to establish a uniform method and practice in testing public water supply systems for exfiltration, chlorine residual, disinfection, and bacteria.

PART 2 – PRODUCTS

Not used

PART 3 - EXECUTION

3.01 BACTERIA TEST

A. After final flushing has been completed a bacteriological sample shall be taken in accordance with AWWA C651.

B. The sample(s) shall be collected from the end of the line. At least one (1) sample shall be collected from the new main and one from each branch. In extremely long mains, it is desirable that samples be collected along the length of the line as well as its end.

C. The standard sample shall be collected in sterile bottles care being taken not to contaminate the neck of the bottle or stopper during collection.

D. This sample will then be delivered to a certified laboratory designated by the Engineer or the Engineer's representative for analysis or sample collected by the certified lab.

E. Copies of the analysis shall be sent to the Engineer directly from the laboratories.

F. In the event that the laboratory analysis shows bacteria present, the line shall be re-chlorinated, flushed, sterilized and a new sample taken until such time as all requirements are met.

G. Prior to any public water supply system being accepted by the Engineer and his client, all of the requirements contained herein shall have been satisfied.

PART 4 – QUANTITY AND PAYMENT

4.01 Testing

A. Quantity of all testing items will not be measured for this project, but the work shall be performed as incidental to the proposed work.

B. Payment for all testing items covered will not be made for this project, but the cost shall be included in the various items of the proposal.

END OF SECTION

SECTION 02140
DEWATERING AND FLOW DIVERSION

PART 1 – GENERAL

1.01 Description

A. Dewatering of trenches and excavations.

B. Sanitary sewer flow diversion.

PART 2 – PRODUCTS

2.01 Materials

A. Furnish pumps, carrier pipe, hoses, plugs, temporary lighting, shoring, dewatering wells, geoprobes, and/or any other equipment required for dewatering and flow diversion work.

PART 3 – EXECUTION

3.01 Methods of Work

A. Performance:

1. Dewatering:

   a. Prevent surface water and subsurface or groundwater from flowing into excavations and from flooding project site and surrounding area.

   b. Keep excavations and structures dry until all work is completed. Dewatering well points should be expected to be required at each project location and additional payments for unforeseen dewatering requirements shall not be authorized. Do not use trench excavations as temporary drainage ditches.

   c. Dispose of water in suitable manner, without damage to work site or adjacent property.

   d. Any sediment laden water from trench dewatering shall be filtered through approved sediment barriers prior to discharging onto the surrounding areas.

2. Flow Diversion:

   a. By-pass pumping of sanitary sewer flows as necessary to complete construction of proposed sanitary sewer facilities.

b. The Contractor shall determine fluming pipe and pump sizes necessary for required flow by-pass and submit a by-pass plan to the Engineer for review.

c. The flow diversion system components must be removable in the case of an emergency.

d. Any damage to the existing sewer system caused by flow diversion operations shall be the Contractor's responsibility and shall be repaired at no cost to the Owner.

e. One week prior to all damming and diverting of flows the Contractor shall notify the Owner and the Engineer.

PART 4 – QUANTITY AND PAYMENT

4.01 Dewatering and Flow Diversion

A. Quantity for "Dewatering and Flow Diversion" will not be measured for this project, but the work shall be performed as necessary to keep excavations, trenches and structures dry throughout the duration of the project. Contractor shall be responsible for acquiring all necessary permits associated with this work.

B. Payment for "Dewatering and Flow Diversion" will be made as a lump sum (LS). Payment will be recommended after completion of all excavations have been backfilled.

END OF SECTION

SECTION 02227

EXCAVATION AND BACKFILL

1.01 DESCRIPTION

A. Excavation and backfill shall include the excavation and backfilling for demolition and or removal of existing below grade structures or utilities as indicated in the specifications for all materials of whatsoever nature encountered.

2.01 MATERIALS

A. The Contractor shall, at his expense, make such test pits and borings along the line and site of the work to satisfy himself regarding the character of the various strata of sub-surface materials and the amount of ground water that may be encountered in the course of construction and shall bid accordingly and the unit lump sum prices bid for the various pipes or structures requiring excavation shall include the difficulties to be encountered in excavation. Excavation shall include all materials excavated, encountered, including but not limited to rock, earth, shale, quicksand, gravel, sand, cinders, broken stone, concrete, paving, filled material, etc., and all miscellaneous excavation not herein specified and classified.

B. Backfill material from on-site excavation:

All on-site backfill materials shall be subject to the approval of the Engineer, and to the following requirements.

1. Free from deleterious substances, stumps, brush, weeds, roots, sod, rubbish, garbage and matter that may decay.

2. Backfill to a height of two (2) feet above the top of the pipes, culverts and other structures with material free from stones or rock fragments larger than two inches (2") in greatest dimension, or as directed by Engineer.

3. Free of large rocks or lumps that, in the opinion of the Engineer, may create voids or prevent proper compaction.

3.01 METHOD OF CONSTRUCTION

A. General Excavation - Excavation of all materials of whatsoever nature encountered shall be made to the lines and grades shown on the drawings, or as may be necessary to fully carry out the intent of the drawings, and of these specifications, where no grades are indicated or described. Surfaces of excavations in earth, exposed in the finished work, both level and sloped, shall be excavated in planes four inches lower than the finished surfaces, measured perpendicularly to the plans, and shall be brought up to the finished surfaces with 4" topsoil as specified elsewhere. Finished surfaces shall be true to line and grade and shall be dressed to even planes. Unless otherwise shown or stated on the drawings, all exposed slopes excavated in earth shall be one vertical to two horizontal. Slopes shall be kept true to line and grade during the progress of the work, and should any slope be scoured by storm water, or otherwise disturbed, or should any excavation be scoured or disturbed before final payment is made, the Contractor shall promptly restore the slope or excavation so scoured, gullied or otherwise disturbed to line and grade before final payment is made. No additional compensation will be paid the Contractor by reason of the encountering of any unusual or unexpected subsoil conditions.

B. Unauthorized Excavation - Special care shall be taken to prevent the movement of disturbances of earth under the foundation of the pipelines, manholes and other structures by providing adequate sheathing and bracing. Where the excavation is carried beyond or below the lines and grades given by the Engineer, or wherever the Engineer shall determine that any material has been loosened or disturbed sufficiently to reduce its supporting power, remove all such loosened material and refill all such excavated space to grade with sand or loam thoroughly rammed, in such manner as may be directed by the Engineer in order to ensure the adequate support and stability of the pipeline and other structures. All excavation and any other operation shall be confined to the width of the right-of-ways available.

C. Materials Excavated - The materials excavated shall be laid compactly on the side of the trench or excavation and kept trimmed as to be of as little inconvenience as possible to the travelling public and to adjoining tenants. Where the streets are paved, the paving materials shall be kept separate from the other materials excavated. All streets shall be kept open for travel unless otherwise directed by the Engineer.

D. Removal of Excavated Materials - The Contractor shall not, without permission from the Engineer, remove from the line of the work any excavated materials which may be suitable for filling the trench or excavation until the same has been refilled. All excess excavation shall remain the property of the Owner and shall be disposed of at the location so designated by the Owner within the limits of the Municipality at the Contractor's expense. However, if the Owner has no real need for this excess excavation, it shall be the Contractor's responsibility to dispose of said material at no expense to the Owner. Excess excavation shall be immediately removed.

E. Removal of Water - Maintain and provide at all times during construction ample means and device which shall promptly remove and properly dispose of all water or sewage entering the excavation and structures, until all work to be built therein is completed.

Dispose of the water from the trenches and excavation in a suitable manner, without damage to adjacent property and in no case unless by special permission of the Engineer, shall water be allowed to run through the new pipes. Furnish all necessary machinery, power and labor to pump, bail or otherwise remove any water which may be found or shall accumulate in the trenches or other excavation and shall perform all work necessary to keep them clear of water while the work is under construction.
If the ground water and subsoil conditions along the line of the work are such that the Contractor cannot successfully handle the ditch water and provide a stable, hard trench bottom by ordinary trench pumping and bailing, the Contractor shall furnish and provide the necessary equipment, power, and labor to employ the well point method of trench dewatering without additional compensation. All pipe, joint and concrete must be installed under absolutely dry conditions.

F. Backfilling - The backfilling of the trench will be filled by using properly compacted, common earth material. If sufficient earth cannot be obtained to completely fill the trenches, small pieces of rock may be used under the condition that the space between the walls of the trench and the outside of the pipe to a height one foot above the top of the pipe, be filled with loose, fine earth, free from stone and hand-tamped, and placed in separate layers of not more than one foot in depth and each layer covered with from six to ten inches of earth.

Should excavated material be clay that will not consolidate by ordinary methods of backfilling, it shall be removed from site and replaced with granular material capable of quick compaction, the cost of said material to be included in the unit prices bid for the various pipe items in the Bid Form.

The space between the pipe and the bottom and sides of the trench shall be backfilled by hand and thoroughly tamped with a light hand tamper, as fast as placed. The pipe shall then be covered by hand to a depth of at least one foot above the top of pipe and at least one man shall be engaged in tamping for each man engaged in shoveling into the trench. At this point on, in trenches and all other excavations, the material may be machine backfilled with backfill continuing in lifts not to exceed 12 inches. Each lift shall be thoroughly compacted using mechanical tampers or other methods as approved by the Engineer. Contractor is hereby forewarned that he is responsible for any settlement of trench and excavation and the results thereof which may occur within one year following acceptance of the work.
During the backfill procedure, the soil compaction shall conform to not less than the following percentage of the maximum dry density:

1. Structures & Building Areas - 95%
2. Lawns & Unpaved Areas - 90%
3. Pavement, driveways & walkway areas - 95%

G. Interference with Existing Structures or Utilities - In excavating or backfilling, care must be taken not to injure any gas, water, sewer, electric or telephone conduits or other pipes, conduits, or structures. The locations will be made by the Engineer and in locating, he shall avoid interference with existing utilities as far as possible. Contractor shall, at his expense, sling, shore-up and secure and maintain a continuous flow in utilities and shall repair any damage done to them and shall keep them in repair until final acceptance of completed work, leaving them in as good a condition as when uncovered. Where it is either necessary or advisable to locate existing substructures in advance of or during actual construction of the work, the contractor shall cooperate with the Engineer and furnish without cost to the Owner such labor and equipment as may be required to locate any existing subsurface utilities or structures. No payment will be made for delays to contractors due to interference with utilities. The contractor shall, in advance of construction, obtain all available information as to location of existing underground utilities, service, etc. and will be held responsible for damage done by him to underground structures injured in construction.

H. Protection of Street Surfaces - The Contractor shall carefully plank, or otherwise protect all street surfaces, gutters, curbs, and sidewalks before moving any heavy equipment, machinery, tractor, or truck over the same. He will be held fully responsible for all damage of every kind which may be incurred by the various surfaces and the Contractor shall repair or rebuild the surfaces as specified for the various surfaces elsewhere herein the specifications except that no payment will be made by the Owner to the Contractor for repair or rebuilding of the surfaces outside the trench areas. The surfaces repaired shall be equal to or superior to the surfaces damaged.

I. Detours, etc. - Contractor shall, where necessary, provide and erect all detour signs and maintain necessary barricades and lights. He shall confer with the local police chief and fire chief before blocking any street. Contractor shall construct temporary bridges in order to provide access to driveways, etc. when required.

4.01 QUANTITY AND PAYMENT

A. Quantity of Excavation and Backfill will not be measured for this project, but the work shall be performed as described herein.

B. Payment for Excavation and Backfill will not be made for this project, but the costs shall be included in the lump sum prices bid for each demolition site.

END OF SECTION

SECTION 02270
TEMPORARY SOIL EROSION & SEDIMENT CONTROL

PART 1 – GENERAL

1.01 Description

A. This work shall consist of temporary control measures ordered by the Engineer during the life of the contract and as shown on plans, to control erosion and sediment through use of silt fence, filter outlets, diversion berms, dikes, dams, sediment basins, fiber mats, netting, gravel, mulches, grasses and other erosion control devices or methods.

B. The primary objective of this specification is to control soil erosion to the maximum extent practicable commensurate with reasonable and economical construction practices.

C. The temporary control provisions contained herein shall be coordinated with the permanent erosion control features (grass, pavement, and other restorations) specified elsewhere in the contract to the extent practical to assure economical, effective, and continuous erosion control throughout the construction and post-construction period.

D. The erosion control measures described herein shall be continued until the construction is complete and final restorations installed.

E. Wherever construction exposes work, which is subject to erosion, the extent of such exposure in advance of the subsequent construction shall be subject to the approval of the Engineer. Erosion control features or other work to be completed within such areas shall follow as soon after exposure as practicable.

F. All materials and methods of construction shall be in accordance with the Maryland Department of the Environment for Soil Erosion and Sediment Control.

PART 2 – PRODUCTS

2.01 Materials

A. Mulches may be hay, straw, fiber mats, netting, wood cellulose, corn or tobacco stalks, bark, corn cobs, wood chips, or other suitable material acceptable to the Engineer and shall be reasonably clean and free of noxious weeds and deleterious materials.

B. Grass shall be a quick growing species (such as rye grass, Italian rye grass, or cereal grasses) suitable to the area providing a temporary cover.

C. Fertilizer and soil conditioners shall be a standard commercial grade acceptable to the Engineer.

D. Requirements for silt fence:

1. Fence posts shall be spaced 8 feet center-to-center or closer. They shall extend at least 3 feet into the ground. They shall extend 33 inches above ground.

2. A filter fabric, recommended for such use by the manufacturer, shall be buried at least 8 inches deep in the ground and then shall extend 6" parallel to grade. The filter fabric shall extend at least 33 inches above the ground.

3. The barrier shall be constructed so water cannot bypass the barrier around the ends.

4. Inspection shall be frequent, and repair or replacement shall be made promptly as needed.

5. The barrier shall be removed when it has served its usefulness so as not to block or impede storm flow or drainage.

E. Other as specified by the Engineer.

PART 3 – EXECUTION

3.01 Methods of Construction

A. Preconstruction Conference:

1. At the preconstruction conference or prior to the start of the applicable construction, the Contractor shall submit for acceptance his schedules for accomplishment of temporary and permanent erosion control work, as are applicable for excavation work, and any other elements of the project which may contribute to ground erosion or siltation. No work shall be started until the erosion control schedules and methods of operations have been accepted by the Engineer.

B. Construction Requirements:

1. The Engineer has the authority to limit the surface area of erodible earth material exposed by excavation and grading operations, and to direct the Contractor to provide immediate permanent or temporary pollution control measures to prevent contamination of adjacent streams, water courses, or bodies of water. Such work may involve the construction of temporary berms, dikes, dams, sediment basins, slope drains, and use of temporary mulches, mats, seeding or other control devices or methods as necessary to control erosion. Cut slopes shall be temporarily seeded and

mulched as the excavation proceeds to the extent considered desirable and practicable.

2. The Contractor will be required to incorporate all permanent erosion control features to include the required pavement and grass restorations into the project at the earliest practicable times as outlined in his accepted schedule. Temporary control measures will be used to correct conditions that develop during construction that were not foreseen during the design stages that are needed prior to installation or permanent control features; or that are needed temporarily to control erosion that develops during normal construction practices but are not associated with permanent control features on the project.

3. Where erosion is likely to be a problem, excavation and grading operations shall be so scheduled and performed that permanent erosion control features can follow immediately; otherwise, temporary erosion control measures may be required between successive construction stages.

4. In the event of conflict between these requirements and pollution control laws, rules, or regulations of other federal or state or location agencies, the more restrictive laws, rules or regulations shall apply.

5. The Contractor will be responsible for maintaining all soil erosion and sediment control measures in an acceptable manner. All temporary measures shall be removed by the Contractor as directed by the Engineer.

PART 4 – QUANTITY AND PAYMENT

A.01 Temporary Soil Erosion and Sediment Control

A. Quantity of Temporary Soil Erosion and Sediment Control will not be measured for this project, but the work shall be performed as described herein and in accordance with the regulations set forth by the Maryland Department of the Environment and the County Conservation District.

B. Payment for temporary soil erosion and sediment control measures will be made on a Lump Sum (LS) basis for the item “Temporary Erosion and Sediment Control Measures” on the Bid Form. Work includes all materials, labor, and equipment and all else necessary therefore and all other work in connection therewith and incidental thereto to complete the work specified within this section and on the plans.

C. In case of repeated failures on the part of the Contractor to control erosion, pollution, and/or siltation, the Owner reserves the right to employ outside assistance or to use in-house forces to provide the necessary corrective measures. Such incurred costs will be charged to the Contractor.

END OF SECTION

SECTION 02392
TRAFFIC STRIPES AND SYMBOLS

PART 1 – GENERAL

1.01 Description

A. This work shall consist of the striping or painting concrete surfaces.

PART 2 – PRODUCTS

2.01 Materials

A. All materials shall conform to Section 550 of the Maryland Department of Transportation Standard Specifications.

PART 4 – EXECUTION

3.01 Method of Construction

A. Method of construction shall conform to Section 549 (Epoxy Line Paint) the Maryland Department of Transportation Standard Specifications.

PART 4 – QUANTITY AND PAYMENT

4.01 Striping

A. Quantity of "Line Striping, Replace in Kind" will not be measured for this project, but will be paid as a Lump Sum (LS) item once all related work is completed.

B. Payment for "Line Striping, Replace in Kind" will be made as a Lump Sum (LS), and shall include all material, labor and equipment necessary to layout and install all crosswalks, stop bars, center lines, and any other markings in accordance with the inventory taken before milling or excavation.

END OF SECTION

SECTION 02411
SELECTIVE DEMOLITION

PART 1 - GENERAL

1.1 SCOPE OF WORK

A. Section Includes:

1. Demolition and removal of selected portions of structures, piping, equipment, and all other items indicated on contract drawings.

2. Salvage of existing items to be reused or recycled. The retained items are pumps, motors and all valves.

1.2 MATERIALS OWNERSHIP

A. Unless otherwise indicated, demolition waste becomes property of Contractor.

B. Historic items, relics, antiques, and similar objects including, but not limited to, cornerstones and their contents, commemorative plaques and tablets, and other items of interest or value to Owner that may be uncovered during demolition remain the property of Owner.

1. Carefully salvage in a manner to prevent damage and promptly return to Owner.

C. Schedule of Selective Demolition Activities: Indicate the following:

1. Detailed sequence of selective demolition and removal work, with starting and ending dates for each activity. Ensure Owner's representative on-site operations are uninterrupted.
2. Interruption of utility services. Indicate how long utility services will be interrupted.
3. Coordination for shutoff, capping, and continuation of utility services.

D. Predemolition Photographs or Video: Submit before Work begins.

1.3 CLOSEOUT SUBMITTALS

A. Notify Engineer of discrepancies between existing conditions and Drawings before proceeding with selective demolition.

B. Hazardous Materials: It is not expected that hazardous materials will be encountered in the Work.

1. If suspected hazardous materials are encountered, do not disturb; immediately notify Engineer and Owner. Hazardous materials will be removed by Owner under a separate contract.

C. Storage or sale of removed items or materials on-site is not permitted.

D. Utility Service: Maintain existing utilities indicated to remain in service and protect them against damage during selective demolition operations.

1. Maintain fire-protection facilities in service during selective demolition operations.

PART 2 - PRODUCTS

2.1 NOT USED

PART 3 - EXECUTION

3.1 PERFORMANCE REQUIREMENTS

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

B. Standards: Comply with ANSI/ASSE A10.6 and NFPA 241.

3.2 EXAMINATION

A. Verify that utilities have been disconnected and capped before starting selective demolition operations.

B. Survey existing conditions and correlate with requirements indicated to determine extent of selective demolition required.

C. When unanticipated mechanical, electrical, or structural elements that conflict with intended function or design are encountered, investigate and measure the nature and extent of conflict. Promptly submit a written report to Engineer.

3.3 UTILITY SERVICES AND MECHANICAL/ELECTRICAL SYSTEMS

A. Existing Services/Systems to Be Removed, Relocated, or Abandoned: Locate, identify, disconnect, and seal or cap off indicated utility services and mechanical/electrical systems serving areas to be selectively demolished.

1. If services/systems are required to be removed, relocated, or abandoned, provide temporary services/systems that bypass area of selective demolition and that maintain continuity of services/systems to other parts of building.

2. Disconnect, demolish, and remove plumbing, equipment, and components indicated to be removed.

    a. Piping to Be Removed: Remove portion of piping indicated to be removed and cap or plug remaining piping with same or compatible piping material.
    b. Piping to Be Abandoned in Place: Drain piping, fill with concrete and cap or plug piping with same or compatible piping material.
    c. Equipment to Be Removed: Disconnect and cap services and remove equipment.
    d. Equipment to Be Removed and Reinstalled: Disconnect and cap services and remove, clean, and store equipment; when appropriate, reinstall, reconnect, and make equipment operational.

3.4 PREPARATION

A. Site Access and Temporary Controls: Conduct selective demolition and debris-removal operations to ensure minimum interference with roads, streets, walks, walkways, and other adjacent occupied and used facilities.

B. Temporary Shoring: Provide and maintain shoring, bracing, and structural supports as required to preserve stability and prevent movement, settlement, or collapse of construction and finishes to remain, and to prevent unexpected or uncontrolled movement or collapse of construction being demolished.

    1. Strengthen or add new supports when required during progress of selective demolition.

3.5 SELECTIVE DEMOLITION, GENERAL

A. General: Demolish and remove existing construction only to the extent required by new construction and as indicated. Use methods required to complete the Work within limitations of governing regulations and as follows:

1. Do not use cutting torches until work area is cleared of flammable materials. At concealed spaces, such as duct and pipe interiors, verify condition and contents of hidden space before starting flame-cutting operations. Maintain fire watch and portable fire-suppression devices during flame-cutting operations.
2. Maintain adequate ventilation when using cutting torches.
3. Remove decayed, vermin-infested, or otherwise dangerous or unsuitable materials and promptly dispose of off-site.

4. Locate selective demolition equipment and remove debris and materials so as not to impose excessive loads on supporting walls, floors, or framing.
5. Dispose of demolished items and materials promptly.

B. Removed and Reinstalled Items:

1. Clean and repair items to functional condition adequate for intended reuse.
2. Pack or crate items after cleaning and repairing. Identify contents of containers.
3. Protect items from damage during transport and storage.
4. Reinstall items in locations indicated. Comply with installation requirements for new materials and equipment. Provide connections, supports, and miscellaneous materials necessary to make item functional for use indicated.

3.6 DISPOSAL OF DEMOLISHED MATERIALS

A. General: Except for items or materials indicated to be recycled, reused, salvaged, reinstalled, or otherwise indicated to remain Owner's property, remove demolished materials from Project site and legally dispose of them in an EPA-approved landfill.

1. Do not allow demolished materials to accumulate on-site.
2. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.

B. Burning: Do not burn demolished materials.

C. Disposal: Transport demolished materials off Owner's property and legally dispose of them.

3.7 CLEANING

A. Clean adjacent structures and improvements of dust, dirt, and debris caused by selective demolition operations. Return adjacent areas to condition existing before selective demolition operations began.

PART 4 QUANTITY AND PAYMENT

A. Payment for demolition shall be made on a lump sum (LS) basis for the item “Selective Demolition” on the Bid Form. Work includes demolition and removal of equipment and materials as shown on plans including but not limited to, sanitary sewer stubs and caps, all labor, materials, equipment and all else necessary therefore and all other work in connection therewith and incidental thereto to complete the work specified within this section and on the plans.

END OF SECTION

SECTION 02550
SAWCUTTING - BITUMINOUS AND CONCRETE SURFACES

PART 1 – GENERAL

1.01 Description

A. When Sawcutting is specified or required for a neat construction joint, sawing equipment shall be provided adequate in number of units and power to complete the sawing to the required dimensions and at the rate necessary to prevent uncontrolled cracking. The saws shall be equipped with water-cooled diamond edge blades or abrasive wheels and alignment guides.

B. Saw shall be of a sufficient size to perform a straight even cut with no irregularities when measured with a ten (10) foot straight edge.

C. This section shall include the full depth sawcutting of the existing concrete or bituminous material.

D. At least one (1) standby saw in working order shall be provided. An ample supply of saw blades shall be maintained at the work site at all times during sawing operation.

PART 2 – PRODUCTS

Not used

PART 3 – EXECUTION

Not used

PART 4 – QUANTITY AND PAYMENT

4.01 Sawcutting – Bituminous and Concrete Surfaces

A. Quantity of Sawcutting - Bituminous and Concrete Surfaces will not be measured for this project, but the work shall be performed as required to provide quality, neat and even joints between existing and proposed surfaces.

B. Payment for Sawcutting – Bituminous and Concrete Surfaces will not be made for this project, but the cost shall be included in the various items of the proposal.

END OF SECTION

Appendix A

STANDARD SPECIFICATIONS AND DETAILS FOR PUBLIC WORKS CONSTRUCTION DEPARTMENT OF PUBLIC WORK TOWN OF DENTON, MARYLAND

STANDARD SPECIFICATIONS AND DETAILS FOR PUBLIC WORKS CONSTRUCTION

DEPARTMENT OF PUBLIC WORKS
TOWN OF DENTON, MARYLAND

REVISED MAY 2023

Mark A. Chandler
Superintendent of Public Works

Scott W. Getchell, PO
Town Administrator

TOWN OF DENTON
DEPARTMENT OF PUBLIC WORKS

STANDARD SPECIFICATIONS AND DETAILS FOR PUBLIC WORKS CONSTRUCTION

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GENERAL PROVISIONS

PURPOSE

The Purpose of these "Standard Specifications and Details for Public Works Construction" is to set forth the requirements of the Town of Denton, Maryland, Department of Public Works for the construction, renovation, or replacement of streets, water, sewage, and storm drainage facilities.

DEFINITIONS

Wherever used in these specifications, the following terms shall have the meanings indicated which shall be applicable to both the singular and plural thereof:

1. Collector Street - A street which is intended to collect traffic from the minor streets within a neighborhood or a portion thereof and to distribute such traffic to major thoroughfares, in addition to providing access to properties abutting thereon.

2. Cul-de-sac - A minor street having but one end open for vehicular traffic and with the other end permanently terminated by a turnaround or backaround for vehicles.

3. Contract Documents - The contract, including Advertisement for Bids, Information for Bidders, Bid, Bid Bond, Agreement, Payment Bond, Performance Bond, Notice of Award, Notice to Proceed, Change Order, Drawings, Specifications, and Addenda.

4. Contractor - The individual or entity responsible for performing and completing the construction of a project required by the Contract Documents.

5. Drawings - The part of the Contract Documents which show the characteristics and scope of the work to be performed and which have been prepared or approved by the Engineer.

6. Engineer - Person or organization professionally qualified and duly licensed to perform architectural or engineering services; which may include but not necessarily be limited to development of project requirements; creation and development of project design; preparation of drawings, specifications, and bidding requirements; and providing of services during the construction and start-up phases of the project.

7. Maryland State Highway Administration Specifications - The Maryland Department of Transportation State Highway Administration Standard Specifications for Construction and Materials July 2020.

8. Minor Street - A street other than a major thoroughfare or collector street and intended primarily for providing access to abutting properties.

9. Owner - The Mayor and Town Council of the Town of Denton, Maryland or individual or group for whom the work is to be performed.

10. Resident Project Representative - The authorized representative of the Owner who administers the construction contract and monitors progress and relationships among the project site personnel.

11. Service Drive - A minor street which is parallel to and adjacent to a major thoroughfare, and which provides access to abutting properties and restricts access to the major thoroughfare.

12. Shop Drawings - All drawings, diagrams, illustrations, brochures, schedules and other data which are prepared by the Contractor, a Subcontractor, manufacturer, Supplier or distributor, which illustrate how specific portions of the work shall be fabricated or installed.

13. Specifications - A part of the Contract Documents consisting of written descriptions of a technical nature or materials, equipment, construction systems, standards and workmanship.

14. Subcontractor - An individual, firm or corporation having a direct contract with the Contractor or with any other subcontractor for the performance of a part of the work at the site.

15. Supplier - Any person or organization who supplies materials or equipment for the work, including that fabricated to a special design, but who does not perform labor at the site.

16. Work - All labor necessary to produce the construction required by the Construction Documents, and all materials and equipment incorporated or to be incorporated into the project.

17. Where "as shown", "as indicated", "as detailed", or words of similar import are used, it is understood that reference to the drawings accompanying this specification is made unless stated otherwise.

18. Where "as directed", "as required", "as selected", "permitted", "acceptance", or words of similar import are used, it is understood that direction, requirement,

selection, permission or acceptance by the Engineer and compliance with codes and regulations are intended unless stated otherwise.

19. Where used, "provide" is understood to mean "provide complete in place"; that is, "furnished and installed."

20. Where "items of material, equipment, work, etc.," and "methods of installation, finish, and accomplishment, etc." are referred to in this specification it is understood to refer to all such "items, materials, equipment, work, finish, etc."

21. Where "includes" is used, it understood to mean "includes, but is not limited to."

22. Where "equal to", "or equal", or "approved equal", are used, the Contractor may substitute a product or material, which in the judgment of the Engineer, expressed in writing, is equal to that specified.

ABBREVIATIONS

Where used in these specifications or on details, the following abbreviations shall have the meanings indicated below:

AASHTO	American Association of State Highway and Transportation Officials
ANSI	American National Standards Institute
ASTM	American Society of Testing and Materials
AWWA	American Water Works Association
CL	Class
CTS	Copper Tube Size
DI	Ductile Iron
FIP	Female Iron Pipe
GAB	Graded Aggregate Base
HDPE	High Density Polyethylene
IPS	Iron Pipe Size
LF	Lineal Feet
MDE	Maryland Department of Environment
MDOT SHA	Maryland Department of Transportation State Highway Administration
MIP	Male Iron Pipe
MJ	Mechanical Joint
OSHA	Occupational Safety and Health Administration
P/J	Pack Joint
PEP	Polyethylene Pipe
PSI	Pounds per Square Inch
PVC	Polyvinyl Chloride
ROW	Right-Of-Way
SDR	Standard Dimension Ratio

GENERAL CONDITIONS

The Specifications and Details contained herein are intended to provide requirements for all public works construction undertaken within the Town of Denton. These Specifications and Details are consistent with existing Town of Denton standards, policies, and regulations. In addition to the requirements contained herein, all public works construction shall be in accordance with the most current edition of the following documents.

1. Town of Denton Critical Area Program
2. Comprehensive Plan
3. Land Subdivision Regulations
4. Zoning Ordinance
5. Forest Conservation Ordinance

All construction shall be in accordance with applicable county, state and federal requirements including but not limited to Sediment and Erosion control and Stormwater Management, Maryland Department of Transportation State Highway Administration, Maryland Department of the Environment and U.S. Army Corp of Engineers requirements. In the event of a conflict between the standards and details contained herein and applicable county, state, or federal requirements, the conflict shall be resolved in favor of the stricter requirement.

Upon completion of construction of the public works facilities and final approval thereof by the Town of Denton, right, title and interest in and to said facilities shall be conveyed to the Town of Denton free and clear of any and all liens, claims, charges and encumbrances attaching thereto. Said transfer of the right, title, and interest in and to said facilities shall be accomplished by such documentation as the Town attorney shall deem necessary and appropriate.

Where any article or material is specified by proprietary name, trade name, and/or manufacturer's name, with or without the addition of such expressions as "or equal", or "approved equal", it is to be understood that the article named or the equal thereof, is intended, subject to the approval of the Engineer. It is distinctly understood that; (1) The Engineer is to use his/her own judgment in determining from time to time whether or not any article or material proposed to be substituted is the equal of any article or thing specified; (2) The decision of the Engineer on all such questions or equality shall be final; (3) In the event of any adverse decision by the Engineer no claim of any sort shall be made or allowed against the Engineer or the Owner.

Design parameters for water and sewer utilities shall be in accordance with the latest editions of the Ten State Standards and Maryland Department of the Environment Design Guidelines.

END OF SECTION

SECTION 1

EXCAVATION, BACKFILL & SURFACE RESTORATION

1. GENERAL

A. The Contractor shall excavate, protect, and backfill all excavations that may be necessary for completing the work to be done under the contract. Excavations shall be open cut except where and to such extent as the Engineer or permit requirements may authorize or direct that the same be done by other methods. Trenches may in general be excavated and backfilled either by machinery or by hand as the Contractor may elect provided, however, that the Engineer shall be empowered, wherever he shall decide that such necessity exists, to direct that hand excavation shall be employed, and provided further that backfilling by hand shall be done to the extent hereinafter specified. The Contractor shall have no claim for extra compensation due to the fact that hand instead of machine excavation may be required at any location where necessary from any cause whatever.

B. All excavation under this contract is unclassified; that is, the prices bid for furnishing and laying pipe shall be taken to include and cover all materials required to be excavated and backfilled, whether wet or dry, and regardless of the character of the materials. The excavations, removal and replacement of road surfacing materials, curb, sidewalk, and gutter, as required, shall be included in the unit prices bid for furnishing and laying pipe with any exceptions as noted herein or as designated on the plans.

C. In all areas which the Maryland Department of Transportation State Highway Administration exercises jurisdiction, all excavation and backfill shall be accomplished in full conformance with their requirements.

2. REMOVAL AND STORAGE OF SURFACE AND SUBGRADE MATERIALS

A. The Contractor shall grub and clear the surface and remove all surface and subgrade materials of whatever nature over the line of the trench and the site of other structures and areas to be graded; and he shall properly store, guard, and preserve such of said materials as may be required for use in backfilling, resurfacing, repaving, or for any other purposes.

B. All curb, gutter, sidewalk, concrete traffic markers, brick and flagstones, and all paving material which may be removed for re-use together with all materials taken from trenches, shall be stored in such parts of the roadway or such other suitable places and in such manner as shall be approved or directed. The Contractor shall be responsible for any loss of or damage to curb, gutter, sidewalk, concrete traffic markers, brick, and

flagstones, and to paving material through their careless, or neglectful, or wasteful storage, disposal, or use.

C. Materials shall not be deposited or temporarily stockpiled on private property unless permission is obtained from the individual Owner(s) in writing and the acceptance of the Engineer is secured by the Contractor. Prior to completion and acceptance of the work, a written release shall be obtained from those property owners having accepted disposal materials absolving the Owner from any liability connected therewith. The Contractor shall provide the Engineer with copies of each release.

D. Stockpiled materials shall in no case be placed in such a manner as to endanger the trench, existing structures, private property, or the environmental quality of the area. Measures shall be taken to insure no blockage of existing surface drainage and to minimize the possibility of erosion and siltation of these materials.

E. All materials not suitable for incorporation in the finished work shall be disposed of by the Contractor at a location approved by the Engineer. The Contractor shall be responsible for obtaining a disposal site.

3. WIDTH AND DEPTH OF TRENCHES

A. Trenches shall be excavated to the necessary width as shown on applicable Town of Denton standard details or as described herein and to the necessary depth as shown on the drawings, or as directed.

Pipe Dia.	Trench Width
4" thru 24"	4’-0”
27" thru 30"	5’-0”

B. Where excavation is carried below specified subgrade elevations, or to a greater than detailed trench width, the Contractor shall, at no additional expense to the Owner unless specifically provided for by an approved contingency item associated with a bid proposal, make corrections to subgrade and width using approved backfill materials. Materials so used shall be thoroughly compacted to provide a firm and unyielding subgrade, acceptable to the Engineer.

C. The side of the trenches shall be supported or sheeted where required for safety, or as required by OSHA and/or State safety regulations.

4. LENGTH OF OPEN TRENCH

A. No greater length of trench in any location shall be left open in advance of the completed structure placed therein than shall be authorized or directed. The Engineer shall be empowered at any time to require the backfilling of open trenches over completed pipe lines if in his judgement such action is necessary, and the Contractor

shall thereby have no claim for extra compensation even though to accomplish said backfilling he is compelled temporarily to stop excavation or other work at any place.

B. If work is stopped on any trench for any reason and the excavation is left open in advance of construction, the Contractor shall, if so directed, backfill said trench at his own cost and shall not again open said trench until he is ready to complete the structure therein. If the Contractor shall refuse or fail to backfill said trench completely within 48 hours after said notice, the Owner shall be authorized to so do the work and the Owner shall charge the expense thereof to the Contractor and retain the same out of any monies due, or to become due, to him under the contract.

C. The excavation of all trenches shall be fully completed at least 20 feet in advance of pipe laying unless otherwise authorized.

5. EXCAVATION BELOW SUBGRADE

A. Whenever the character of the material at the bottom of an excavation is such, in the opinion of the Engineer, as to require excavation to an additional depth for adequate foundation, or wherever a trench has been excavated by machinery to the grade directed by the Engineer and he deems it necessary on account of a change in plan to excavate deeper such additional depth shall be excavated by the Contractor as directed by the Engineer.

B. Except as modified above, subgrade in the case of pipe lines shall be termed the underside of the pipe foundation as shown on the plans. For miscellaneous structures, subgrade shall be termed the underside of the masonry slab, foundation or gravel bedding as shown on the plans, or as described in the specifications.

6. PREPARATION OF FOUNDATION

A. The Contractor shall complete excavations in earth as nearly as practicable to the neat lines of the structures to be built therein. All irregularities and cavities in the bottoms of trenches shall be filled to the required level with clean earth, or other approved material firmly compacted before pipe lines are laid therein and without extra compensation unless said cavities have been formed at the direction of the Engineer.

B. As directed, the Contractor shall use suitable material from excavation, special backfill, gravel or concrete, or a combination thereof in backfilling excavations below subgrade. The Engineers opinion regarding suitability of excavated material for use in preparation of subgrade shall be final. In general, organic material, refuse, large lumps or stones having any dimensions greater than 2 inches, paving material, frozen earth, or materials which will not readily consolidate or compact in the trench will be considered unsuitable.

C. The requirements for dewatering pipe trenches include an obligation on the part of the Contractor to secure a dry trench bottom. If the Contractor elects to use gravel bedding to assist in drainage of trench bottom, he may do so to the extent approved by the Engineer.

7. DEWATERING

A. Dewatering shall be accomplished by methods which shall insure that the groundwater will be drawn down to an elevation below the bottom of the bedding. Said methods may include deep wells, well points, and other means, subject to acceptance of the Engineer. Upon removal of such dewatering equipment, the Contractor shall backfill, consolidate and pave (in roads) all holes, including restoration of adjacent disturbed areas to pre-existing, or better, conditions.

B. Dewatering for structures and pipelines shall commence when groundwater is first encountered and shall be continued until such time as backfill operations have been completed.

C. The Contractor shall provide for the disposal of all water removed from excavations so that it will not cause injury to the public health, to public or private property, or to any portion of the work completed or in progress, or cause any impediment to the use of the streets by the public. Excessive local ponding and siltation, or its deposition will not be tolerated.

D. Dewatering operations in trenches adjacent to existing structures shall be accomplished in a manner which will exclude the possibility of earth material being washed from areas outside the confines of the trench structurally endangering existing structures.

E. Should the Contractor's dewatering operations affect any existing private water supply well used exclusively as a primary potable water source, the Contractor shall, at no additional cost to the Owner, take whatever steps are necessary to provide uninterrupted water service, including the installation of temporary water lines, if required.

F. The cost of dewatering and associated work shall be considered as incidental to other bid items and included in the prices bid for them.

G. It shall be the Contractor’s responsibility to verify groundwater conditions prior to bidding. Should soil boring information provided as a part of the Contract Documents indicate no ground water present at the time they were prepared, this does not relieve the Contractor of his responsibility. The presence or absence of groundwater at the time of construction shall not entitle the Contractor to additional compensation.

8. SHEETING, SHORING AND/OR BRACING

A. The Contractor shall support the sides and ends of all excavations, wherever necessary, with sheeting, shoring and/or bracing of the quality and character as required. All sheeting, shoring and/or bracing shall be put in place by men skilled in such work and shall be so arranged that it may be withdrawn, as backfilling proceeds, without injury to the structures built under the contract, or to any road bed or adjacent structure, or property.

B. All sheeting, shoring and/or bracing in excavations shall be withdrawn in stages on both sides of trenches (to prevent lateral movement of the pipe) as the backfilling is being done, except where and to such extent as the Engineer shall order in writing that said sheeting be left in place, or where he shall permit the same to be left in place at the Contractor's expense upon his request. The Contractor shall cut off any sheeting ordered left in place as directed and shall remove the material cut off without compensation therefore.

C. Wherever necessary in quicksand, or soft ground, or for the protection of any structure or property, sheeting shall be driven without extra compensation to such additional depth below the bottom of the trench as may be required or directed.

D. The cost of installing and removing sheeting will be included in the unit prices bid for furnishing and installing pipe.

E. A trench box may be used in lieu of sheeting, shoring and/or bracing only upon approval of appropriate Safety Agencies.

9. MISCELLANEOUS EXCAVATION

A. The Contractor shall perform such miscellaneous excavation as may be necessary or directed. Such excavation shall be subject to the same conditions and requirements as specified for trench excavation.

B. Miscellaneous Excavation shall include the digging of test pits, extra width of trench made necessary by change in its location, or excavation for any special structures outside the trench that may not be shown on the drawings or described in the specifications, where such excavation is done at the direction of the Engineer.

C. Test pits shall be dug by the Contractor, whenever directed. The depth and size shall be such as required by the Engineer. Test pits shall be dug by the Contractor, without being directed to do so, along the lines of the trenches as shown on the drawings in advance of the excavation for the purpose of satisfying himself as to the location and elevation of underground obstructions or conditions.

10. BACKFILLING

A. The Contractor shall backfill all excavations as rapidly as practicable after the completion of construction work therein or after the excavations have served their purpose. All unauthorized excavations made by the Contractor shall be immediately backfilled. All backfilling shall be accomplished as specified herein and as indicated on applicable trench cross section details.

B. Materials from excavation shall be used for backfill unless, in the opinion of the Engineer, such material is not suitable for such use. In general, organic material, refuse, large lumps or stones having any dimension greater than 2-inches, paving material, frozen earth, or materials which will not readily consolidate or compact in the trench will be considered unsuitable. The Engineer's decision regarding suitability or unsuitability of materials shall be final.

C. Backfill materials shall be carefully placed and compacted along the haunch of the pipe. Unless otherwise indicated or directed, backfill materials shall be hand placed in 6-inch lifts to a point at least one foot above the pipe crown. Each layer shall be thoroughly compacted for the full trench width and under, around and over the pipe, using mechanical tampers exerting a pressure of not less than 250 foot-pounds per square foot of tamping force.

D. Unless otherwise indicated or directed, the remainder of trench, more than one foot above pipe crown, may be backfilled by machinery. In areas under MDOT SHA jurisdiction the trench will be backfilled in 8" layers. All other areas may be backfilled in 12" layers. Each layer shall be thoroughly compacted for the full trench width using mechanical tampers or other suitable equipment. Heavy duty equipment shall not be run over the trench unless pipe cover exceeds three (3) feet.

E. All backfill materials under roadways, driveways, or shoulder areas shall be compacted to 95% density. All other areas shall have backfill materials compacted to 90 percent of maximum density at optimum moisture content for the specific soil classification, as determined by the modified Proctor Test AASHTO T-180 Method A or ASTM D-1557. If the Engineer has reason to believe that proper compaction of trench backfill is not being obtained, he may direct that Proctor and field density testing be done to determine the degree of compaction. Such testing shall be arranged by the Contractor and performed by an independent testing agency approved by the Engineer. Whenever test results indicate compaction densities less than specified, the Contractor shall secure the specified compaction using methods approved by the Engineer. The testing agency, so employed by the Contractor, shall submit a copy of all testing reports directly to the Engineer. Each report shall contain the project identification name and number, name of Contractor, name of testing agency, and location of sample tested by station, street and depth, as a minimum.

F. After completion of backfilling, all material not used shall be removed and disposed of in such manner and at such point as shall be approved, or directed, and all roads, sidewalks, and other places on the line of the work shall be left free, clean and in good order. Said cleaning up shall be done by the Contractor, and if he shall fail to do such work within a reasonable time after receipt of notice, it will be performed by the Owner, and the cost shall be retained out of the monies due, or to become due, the Contractor under the contract.

G. Vibratory rollers may be used at the surface if approved by the Engineer. Variation in depth of fill layers will not be permitted because of the use of vibratory rollers.

H. No pipelines shall be backfilled until measurements of pipe, etc. have been made by the Engineer and until the Engineer's permission to backfill has been secured. Any pipelines covered without authorization shall, if required by the Engineer, be unearthed for any required inspections, measurements, or testing.

11. SPECIAL BACKFILL

A. Should any excavated materials be considered by the Engineer to be unsatisfactory for backfill, the Contractor shall remove and dispose of such material at an approved location.

B. If sufficient approved material from excavation at other work locations is not available for backfill, the Contractor shall secure and place sufficient approved material from borrow to complete the backfill.

C. All requirements for placement, compaction, and field testing of backfill material shall apply as well to "Special Backfill."

E. The Contractor shall be required to submit a MDOT SHA approved source of supply for borrow materials at the pre-construction conference.

12. PRODUCTS

A. Special Backfill: Material from borrow conforming to MDOT SHA Specification Section 916.01.

B. Gravel Bedding: Crushed stone or gravel meeting MDOT SHA Specification Section 901.01 for No. 57.

C. Misc. Concrete: 3000 psi concrete.

D. Crusher Run: Graded aggregates meeting, MDOT SHA Specification Section 901.01 for Graded Aggregate (GA) Base.

13. RESPONSIBILITY FOR CONDITION OF EXCAVATION

A. The Contractor shall be responsible for the condition of all excavations made by him. All slides and caves shall be removed without extra compensation at whatever time and under whatever circumstances they occur.

B. The neglect, failure or refusal of the Engineer to order the use of bracing or sheeting of a better quality or larger size of timber, or to order sheeting, bracing, or shoring to be left in place, or the giving or failure to give order or directions as to the manner or methods of placing or driving sheeting, braces, or shores, shall not in any way or to any extent relieve the Contractor of any responsibility concerning the condition of excavations or of any of his obligations under the contract; nor shall any delay, whether caused by any action or want of action on the part of the Contractor or by any act or want of action of the Owner or his agents or employees resulting in the keeping of an excavation open longer than would otherwise have been necessary, relieve the Contractor from the necessity of properly and adequately protecting the excavation from caving or slipping or from any of his obligations under the contract relating to injury of person or property nor entitle him to any claim for extra compensation.

14. PROTECTION OF PROPERTY AND STRUCTURES

A. The Contractor shall sustain in their places and protect from direct or indirect injury all pipes, wires, conduits, poles, tracks, walls, signs, wells, septic tanks, buildings, and other structures or property in the vicinity of his work whether above or below ground, or that may appear in the trench. He shall at all times have a sufficient quantity of timber and plank, chains, ropes, etc. on the site and shall use them as necessary for sheeting his excavations and for sustaining or supporting any structures that are uncovered, undermined, endangered, threatened, or weakened. The Contractor shall take all risks attending the presence or proximity of pipes, wires, conduits, poles, tracks, walls, buildings, and other structures and property of every kind and description in or over his trenches or in the vicinity of his work whether above or below the ground surface, and he shall be responsible for all damage and assume all expense for direct or indirect injury caused by his work to any of them or to any person or property by reason of injury to them, whether such structures are, or are not, shown on the drawings.

15. OBSTRUCTIONS SHOWN/NOT SHOWN ON DRAWINGS

A. Certain information regarding the reputed presence, size, character, and location of existing underground and above ground structures have been shown on the plans. There is no certainty as to the accuracy of this information, and it shall be considered by the Contractor in this light. The locations and elevations of underground and/or above ground structures shown may be inaccurate, and obstructions other than those shown may be encountered. The Contractor shall hereby distinctly understand that the Owner

is not responsible for the correctness or sufficiency of the information given, or on account of the insufficiency or absence of information regarding obstructions either revealed, or not revealed by the drawings; and that he shall have no claim for relief from the obligation or responsibility under the contract in case the location, size or character of any pipe, wire, conduit, pole, sign or other underground and/or above ground structure is not as indicated on the drawings or in case any pipe, wire, conduit, pole, sign or other underground and/or above ground structure is encountered that is not shown on the drawings.

B. The Contractor shall locate, protect, change, remove, realign, relocate, replace, or repair all signs and overhead and underground obstructions, structures and utilities whether shown on the drawings or not, as necessary for construction of the project. The contractor shall contact "Miss Utility" prior to any excavation activities. The Contractor shall uncover and support such structures before such removal, and before and after such alignment or change, as a part of the contract; and the Contractor shall not be entitled to any claim for damage on account of the presence of said structure or on account of any delay in the removal or rearrangement of same. The Contractor shall break through and reconstruct if necessary the invert or arch of any sewer, culvert, or conduit that may be encountered if said structure is in such position as, in the judgment of the Engineer, does not require its removal, realignment, or complete reconstruction. The Contractor shall obtain the written permission of the property owner affected prior to the Contractor relocating, realigning and/or replacing any obstructions to construction owned by said affected property owner.

16. REMOVAL OF OBSTRUCTIONS

A. Except for items specifically noted to be removed or relocated, if the position of any pipe, conduit, pole, or other structure above or below ground, and not shown on the plans, be such, in the opinion of the Engineer, as to require its removal, realignment, or change due to work to be done under the contract, the work or removal, realignment or change will be done as extra work, or will be done by the Owner of the obstructions without cost to the Contractor; but the Contractor shall uncover and support such structures before such removal, and before and after such alignment or change, as a part of the contract; and the Contractor shall not be entitled to any claim for damage on account of the presence of said structure or on account of any delay in the removal or rearrangement of same.

B. The Contractor shall not interfere with any persons, firms, or corporations or with the Owner in protecting, removing, changing or replacing their pipes, wires, conduits, poles, or other structures; but he shall suffer said persons, firms or corporations or the Owner to take all such measures as they may deem necessary or advisable for the purpose aforesaid; and the Contractor shall thereby be in no way relieved of any of his responsibilities under the contract.

17. CHANGE OF TRENCH LOCATION

A. In case the Engineer shall direct that the location of a trench be changed to a reasonable extent from that shown on the plans on account of the presence of an obstruction or from other cause or if a changed location shall be authorized upon the Contractor's request, the Contractor shall not be entitled to extra compensation or to a claim for damage provided that the change is made before the excavation is begun. If, however, such change, made at the direction of the Engineer, involved the abandonment of excavation already made, such abandoned excavation together with the necessary refill will be classed as "Miscellaneous Excavation and Backfill". In the event that the trench is abandoned in favor of a new location at the Contractor's request, the abandoned excavation and refill shall be at the Contractor's expense.

B. If an obstruction shall lie within the trench in such manner that the trench has to be excavated to extra width in order that sheeting, shoring and/or bracing may be properly placed or in order that the structure to be placed in the trench may be properly built, such extra width of trench shall be classed as "Miscellaneous Excavation and Backfill". No sloping of sides of excavations, however, will be considered as miscellaneous excavation.

18. MATERIAL EXCAVATED NOT THE PROPERTY OF CONTRACTOR

A. The Contractor shall have no property right to any material taken from any excavations, and shall not remove any earth, sand, or other material from the site of the work, except upon direction or written permission of the Engineer, or as hereinbefore specified.

B. The Contractor shall not be relieved by the above provisions of any of his obligations to remove and dispose of materials excavated, with or without rehandling, as elsewhere herein provided.

19. MAINTENANCE OF BACKFILLED EXCAVATIONS

A. The Contractor shall maintain at his own expense all back-filled, repaved, topsoiled or elsewise restored areas in proper condition until the end of the guarantee period for the project. All defects shall be promptly corrected. If the Contractor shall fail to do so within a reasonable time after the receipt of written notice from the Engineer, the Engineer may remedy such defects and the cost thereof shall be deducted from any monies due or to become due the Contractor under the contract. In case of emergency, the Engineer may correct any dangerous condition without giving previous notice to the Contractor; and the cost of so doing shall be retained from any monies due the Contractor.

B. The Contractor shall be responsible for any injury or damage that may result from improper maintenance of trenches or pavement at any time prior to the end of the aforementioned guarantee period.

20. ACCOMMODATION OF TRAFFIC

A. Any restriction or diversion of traffic at any time shall be subject to the approval of the Engineer and the requirements of that agency having jurisdiction over the road in which the Contractor is working.

B. During the progress of the work, sidewalks and crossings shall be kept open for the passage of pedestrians unless otherwise authorized. Streets shall not be unnecessarily obstructed; and unless the Engineer, MDOT SHA and/or Town of Denton as applicable, shall authorize the complete closing of a street, the Contractor shall take such measures at his own expense as may be necessary to keep the street open for traffic. This shall include but not necessarily be limited to the provision, erection and maintenance of all necessary signs, barricades, lights and flagmen or uniformed traffic directors.

C. The Contractor shall construct and maintain without extra compensation such adequate and proper bridges over excavations as may be necessary or directed for purpose of accommodating pedestrian and/or motor vehicles.

D. Construction activities which may temporarily interfere with property access shall be coordinated in advance with the individual property owners.

E. Access to fire hydrants shall be possible at all times and, wherever possible, one lane of traffic shall be maintained to accommodate access by emergency vehicles.

F. If full road closure is authorized, contractor shall make notice, in advance, to all local emergency service agencies including, but not limited to, police, fire, and ambulance departments.

21. ACCOMMODATION OF DRAINAGE

A. Gutters and drains shall be kept open at all times for surface drainage. No damming or ponding of water in gutters or other waterways will be permitted, except to a limited extent where the Engineer shall consider the same necessary or allowable.

B. The Contractor shall be responsible for all necessary diversions of drainage flows and erosion and sediment control measures associated therewith.

22. SURFACE RESTORATION

A. Paving

1. The Contractor shall be required to repave over all excavations made by him in paved areas, for the full width of the disturbed area and for additional width as may be required to secure a satisfactory juncture with undamaged pavement. This requirement includes trimming back existing pavement to secure an even and clean edge for repaving by use of milling machinery or other approved methods.

2. The Contractor shall remove existing paving for such width as is necessary for repaving. If he removes paving for a greater width than is specified or required, or if paving is removed or disturbed due to settlement, or slides, or non-authorized excavation, he shall replace same for the full extent of removal without extra compensation, therefore.

3. The Contractor shall permanently repair or relay all curbs, gutters, sidewalks, driveways, and appurtenances, etc. that have been removed, broken, or otherwise injured in executing any of the work under the contract or by or on account of said work on account of settlement of any refilled excavation at any time prior to the termination of the contract. Said curbs, gutters, sidewalks, driveways, etc. shall be restored to a condition similar and equal to that existing before the damage was done. No patching of squares of cement pavement will be allowed, but whole new square shall be laid in place of any that have been damaged. Curb and gutter replacement shall be made in entire sections with no patching permitted.

4. If the Contractor shall fail or neglect to perform such relaying or repairing of paving, surfacing, roadway curbs, gutters, sidewalks, driveways, and appurtenances, etc. in a proper manner or make provisions for having said work done, the Engineer shall after due notice perform said work or make provisions for performing it; and the Owner shall retain the expense thereof out of any monies due or to become due the Contractor under the Contract.

5. The Contractor shall construct temporary bituminous paving or a stabilized gravel base over backfilled trenches as may be required by the agency having jurisdiction over the road in which he is working, in order to maintain the street in a passable condition prior to repaving. It shall be the responsibility of the Contractor to control dust on all roads, drives and walkways on which traffic is being maintained.

6. In roadways and rights-of-ways subject to jurisdiction of the MDOT SHA, all repaving and resurfacing shall be in strict conformance with MDOT

SHA Policies and Specifications, Standard Specifications and/or permit stipulations issued by same and/or details shown on Sheets SD-3.00, SS-1.00, PW-1.00, PW-1.10, PW-1.20, and PW-1.40 as applicable.

7. In roadways and right-of-ways subject to jurisdiction of the Town of Denton, paved or unpaved surfaces shall be restored to a condition at least equal to that existing before any excavation was commenced and as specified here in and/or detailed on Sheets SD-3.00, SS-1.00, PW-1.00, PW-1.10, PW-1.20, and PW-1.40 as applicable.

8. Contractor must maintain an adequate quantity of asphalt cold patch to meet the needs of temporary roadway material as a prerequisite to proceeding with the work.

B. Bituminous Surface Treatment

1. Where existing bituminous surface treated pavement is disturbed, bituminous surface treatment restoration shall consist of initial prime coat and triple bituminous surface treatment within the limits of pavement resurfacing as shown on the plans.

2. Prior to the application, all existing paved surfaces shall be properly prepared, including filling and grading of all holes and depressions and surface removal of all waves, bumps, and corrugations. The full roadway width shall then be swept for removal of dust, debris and loose or foreign materials and a prime coat applied to all newly prepared surfaces.

3. Bituminous surface treatment shall be in conformance with construction requirements of the MDOT SHA Standard Specification Section 904 – Performance Graded Asphalt Binders and Asphalt Mixes.

C. Bituminous Concrete Pavement

1. Where existing bituminous concrete pavement is disturbed, bituminous concrete pavement restoration shall be as detailed herein and as shown on Sheet SS-1.00. Base course shall be crusher run or air cooled crusher run blast furnace slag, furnished, and placed in conformance with MDOT SHA Standard Specification Section 901 - Aggregates and to existing thickness, lines, and grades. No base course shall be constructed until adjacent curb and gutter is in place.

2. Hot mix, hot laid bituminous concrete pavement for streets shall be furnished and placed to existing lines and grades or as shown on Detail Sheet PW-7.00 – Pavement Restoration and shall be in conformance with applicable provision of MDOT SHA Standard Specification Section 504 –

Asphalt Pavement. Protect curb and gutter during placement of bituminous concrete pavement. Any disfigurement of the curb and gutter during pavement operations shall be promptly remedied by the Contractor.

3. The pavement shall be placed in two layers as shown on Detail Sheet PW-7.00.

4. Each truck load of bituminous concrete shall be weighed and certified as to accuracy and temperature of each load. One copy of this certification shall be delivered to the Engineer or his representative at the time of delivery to the project.

5. Catch basins, inlets, curbs, and all other appurtenances shall be adequately covered and protected prior to application of prime coats and surface courses. No bituminous materials shall be allowed to enter any storm drainage system and suitable containment provisions shall be employed to prevent surface runoff of bituminous materials.

D. Topsoiling and Finish Grading

1. Topsoil all non-paved non-driveway disturbed areas per MDOT SHA Standard Specification Section 701 – Subsoil and Topsoil.

2. Topsoil shall be considered to mean a good friable original sandy or silty loam surface soil, typical of the area, which is capable of supporting native plant growth. Topsoil shall have a pH of 6.0 to 6.8 and ground limestone shall be added and thoroughly incorporated into the soil for pH adjustment as required. Topsoil shall be free of heavy clay, coarse sand, lumps, frozen clods, sticks, roots, or other foreign materials harmful to plant growth.

3. Prior to topsoiling and finish grading operations, all rough graded areas shall be corrected, mounds and ridges shall be cut off, gullies and depressions filled and other necessary repairs performed to enable all surfaces to be brought to the grades shown on the drawings and/or as specified herein, in an even and properly compacted condition.

4. Topsoil shall be placed at a depth of a minimum of 4 inches. Topsoil after subsequent operation shall be raked smooth and rolled lightly. After spreading of topsoil, all large stiff clods, hard lumps, large rocks, roots, stumps, litter, or other foreign matter shall be raked up and removed from the topsoil area and disposed of by the Contractor.

E. Seeding and Mulching

1. Seed and mulch all topsoiled areas and/or as noted on the plans.

2. Seeding and mulching shall be performed in accordance with MDOT SHA Standard Specification Section 704 – Temporary Mulch and Temporary Seeding.

3. Materials:

   a. All seed shall be fresh, clean, from new crop seed. It shall be delivered to the site unopened in original packages which have, affixed to the packages, the guaranteed analysis by a recognized authority.

   b. All pre-mixed seed to be used on the project shall have a certified stamped, signed and dated (not older than 6 months) tag located on each bag. No seed shall be used on any project unless it has been certified as described.

   c. Seed mixture shall be as follows:

	Minimum Percent Purity	Minimum Percent of Germination
25% Red Fescue (creeping)	98	95
55% Kentucky 31 Tall Fescue	98	85
20% Perennial Rye Grass	98	90

   d. Mulch shall consist of air dried straw.

4. Seeding:

   a. The area to be seeded shall be thoroughly loosened to a depth of not less than 4 inches, and if just prior to seeding, the top 2 inches of soil is loose, friable, and free of large clods, rocks, or other extraneous matter 3 inches or more in diameter measured at the widest dimension; and if shaped to the prescribed grade, it shall be a satisfactory seedbed and require no further work.

   b. Lime shall be applied at the rate of up to 160 pounds per 1000 square feet and shall be applied separately and prior to fertilizing and seeding. The lime shall be spread evenly and be worked into the upper 2 to 3 inches of soil after which the seedbed shall have the proper, smooth grade.

   c. Commercial fertilizer of analysis 20-16-12 shall be applied at the rate of 0 to 4.6 pounds per 1000 square feet.

   d. Apply the specified seed mix evenly at the rate of 4.6 pounds per 1000 square feet immediately after fertilizing, and rake the fertilizer and seed evenly into the upper 1/4 of the soil.

e. Until the project is finally accepted, the Contractor shall be required to mow and to maintain vegetation between 4 and 10 inches in height. Also, the Contractor will be required to repair or replace any seeding or mulching that is defective or becomes damaged during the one (1) year warranty and/or maintenance bond period.

f. All seeding shall be done between the dates of August 1 to October 31, or March 1 to April 30, unless otherwise approved, in writing, by the Engineer. No seeding will be done on frozen ground or when the temperature is 32 degrees F or lower.

5. Mulching:

a. Mulch as specified shall be hauled and uniformly and evenly applied within not more than 48 hours after seeding has taken place. Mulch shall be applied at the rate of a minimum of 65 pounds and a maximum of 90 pounds per 1000 square feet, so as to provide a loose depth of between 1 and 2-1/2 inches. A mechanical blower may be used to apply the mulch material, provided the machine has been designed and approved for that purpose. At least 90 percent of the mulch shall be 6 inch pieces or longer. Care shall be taken that machines are not used that cut the mulch into small pieces.

b. All seeded areas shall be mulched as described above unless otherwise specified.

c. All areas that are mulched shall be secured by the following method or by any other method approved by the Engineer.

1) Secure straw mulch immediately after the completion of mulching operations by applying wood cellulose fiber uniformly over the straw without displacing the mulch.

2) The Contractor is warned that all precautions will be taken to guard against damaging or disfiguring structures or property on or adjacent to the project and that he will be held responsible for any such damage resulting from his work.

F. Temporary Seeding Notes

1. Contractor shall be responsible for temporary seeding of disturbed areas where necessary or directed by the Engineer.

2. Temporary seeding shall conform to procedure outlined in MDOT SHA Standard Specification Section 704.

G. Miscellaneous Driveway Restoration

1. All non-paved driveway areas shall be restored in kind with acceptable like materials.

2. Crushed stone, washed gravel, or other aggregate type driveways and parking areas shall be restored by placement of a minimum 2-inch depth of compacted aggregate placed upon a properly prepared subgrade.

END OF SECTION

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SECTION 2

SANITARY SEWERS AND APPURTENANCES

1. GENERAL

A. The Contractor shall furnish all material for and shall construct the pipe lines and all required appurtenances at the locations and to the lines, slopes and elevations shown on the drawings or designated by the Engineer.

B. All sewer pipe shall be polyvinyl chloride (PVC) pipe or ductile iron (DI) pipe.

C. The Contractor shall submit certifications to the Engineer that all pipe, fittings, and joints are as specified herein.

2. POLYVINYL CHLORIDE PIPE AND FITTINGS

A. Polyvinyl chloride (PVC) pipe, used for sewer construction, shall equal or exceed the requirements of ASTM D 3034 for 4-inch through 15-inch pipe and ASTM F 679 for 18-inch through 27-inch pipe. The PVC sewer pipe shall have a minimum standard dimension ratio (SDR) of 35 and the minimum pipe stiffness, as tested in accordance with ASTM D 2412, shall be 46 when measured under 5 percent deflection at 73 degrees Fahrenheit. Pipe shall be manufactured with integral wall bell and spigot joints in standard lengths not exceeding 20.0 feet.

B. All polyvinyl chloride (PVC) pipe and fittings shall utilize an elastomeric O-ring gasketed joint assembled in accordance with the manufacturer's recommendations. The gasket shall meet the requirements of ASTM F 477. Fittings shall be manufactured by the pipe manufacturer or approved by the pipe manufacturer for use and compatibility with his pipe.

C. Polyvinyl chloride wye branches, tee wyes, pipe stoppers and other fittings shall be manufactured in accordance with the same specifications and shall have the same thickness, depth of socket, and annular space as the pipe. Wye branches and tee wyes shall be complete pipe sections. Saddle wyes will not be permitted for use.

D. Polyvinyl chloride pipe shall be delivered and stockpiled in unit pallets. Stacking of pallets above 5 feet in height will not be allowed. If pipe is stockpiled for more than 30 days prior to installation in the trench, it must be suitably covered with reflective material to protect the pipe from ultra-violet rays emanating from sunlight. Do not use plastic sheets. Allow for air circulation under covering.

E. Bowed sections of pipe will be unacceptable and installation of pipe which has bowed, whether or not the bow has been corrected, will not be allowed on this project.

F. Pipe and fittings shall be marked with the date and location of manufacture. Pipe and fittings not marked shall be rejected.

3. DUCTILE IRON PIPE AND FITTINGS

A. Ductile iron pipe, for sewer construction, shall be Grade 60-42-10, centrifugally cast in accordance with ANSI A21.6 or A21.8, with mechanical or push-on (Tyton) joint ends, not less than 12 feet nor more than 20 feet in length. Ductile iron sewer pipe shall be Class 50, unless otherwise noted or directed by the Engineer, in accordance with ANSI A21.51 (AWWA C151).

B. Fittings and specials for ductile iron pipe shall be made of cast iron in accordance with ANSI A21.10 and rated for 250 psi working pressure.

C. Each length of pipe and each fitting shall be marked with the weight and shall have distinctly cast upon them the pressure rating. Each length of pipe and each fitting shall have the manufacturer's identification and the year of manufacturer painted in a conspicuous location. Ductile iron pipe shall have the letters "DI" or "Ductile" cast or stamped on the pipe.

D. All pipe and fittings shall be double cement lined inside and be bituminous coated inside and out per ANSI A 21.4.

4. PIPE INSTALLATION

A. Pipe and fittings shall be carefully handled and lowered into the trench. Special care shall be taken to insure that each length shall abut against the next in such manner that there shall be no shoulder or unevenness of any kind along the inside of the pipe.

B. Before pipe is placed, the bottom of the trench shall be carefully shaped to fit the lower part of the pipe exterior with reasonable closeness for a width of at least 60% of the pipe width as indicated on the plans. Bell holes shall be dug sufficiently large to insure the making of proper joints and so that after placement, only the barrel of the pipe receives bearing pressure from the trench bottom. No pipe shall be brought into position until the preceding length has been thoroughly bedded and secured in place. Any defects due to settlement shall be made good by the Contractor without additional compensation, therefore.

C. Proper and suitable tools and appliances for the safe and convenient handling and laying of pipe shall be used. Pipe shall be laid to the grades indicated on the Drawings. Pipe shall be laid with the bell ends uphill.

D. Whenever a pipe requires cutting to fit into the line or to bring it to the required location, the work shall be done in a satisfactory manner so as to leave a smooth end.

E. The pipes shall be thoroughly cleaned before they are laid and shall be kept clean until the acceptance of the completed work. The open ends of all pipe lines shall be provided with a stopper carefully fitted so as to keep dirt and other substances from entering. This stopper shall be kept in the end of the pipe line at all times when pipe laying is not in actual progress.

F. All concrete required to support and reinforce wye branches, tee wyes, bends, fittings, and concrete encasements shall be placed as directed, and the cost thereof shall be included and covered within the unit price bid. Supports are to be as detailed on the drawings. Concrete encasement will be a minimum of 6" thick around the pipe or as detailed on the drawing.

G. Backfill materials shall be hand placed and mechanically tamped in six inch layers, placed uniformly on both sides of the pipe, to a point at least one foot above the pipe crown. Each layer shall be thoroughly compacted for the full trench width and under, around and over the pipe. Mechanical tampers shall exert a pressure of not less than 250 foot pounds per square foot of area of tamping face.

H. For refill of the remaining trench depth, refer to Section 1 "Excavation, Backfill and Surface Restoration".

I. A minimum vertical separation of 18 inches between water mains and sewer lines shall be maintained throughout the project. Where this condition is not met, the sewer main shall be encased in concrete in accordance with the associated detail. Where water mains and sewer lines cross, sewer pipe joints shall be equidistant from the intersection and as far from water main joints as possible.

5. JACKED INSTALLATIONS

A. At the locations, and to the limits indicated on the plans, and where stipulated in permits issued by governing agencies, pipe shall be installed using the "dry-cased" method of jacked construction. Open cut construction will not be permitted at these locations.

B. A complete detailed design procedure and method shall be submitted for each such installation and, as a minimum shall contain layout sketches indicating pit dimensions and location with respect to adjacent structures, complete details of the approach pit including design and details of the backstop, face and side bracings, material and equipment specifications and a sequence of operations. The backstop shall be so designed as to withstand a reaction in excess of the maximum jack capacity.

C. It is suggested that the Contractor retain the services of a jacking installation specialist in an effort to preclude the necessity for a restart at a second location due to inadequacies that could be foreseen through the use of such a specialist. Any such additional costs associated with such a restart at a new location shall be borne by the Contractor.

D. The direction of the jacking operation shall generally proceed upstream to allow for groundwater drainage to the approach pit. The approach pit shall be maintained in a dry condition through the use of crushed stone, or quarry waste, and an adequately sized sump pump. Such materials shall be included in the lump sum price bid for jacking.

E. The installation of the casing pipe shall proceed simultaneously with the boring excavation and material removal. The jacked casing shall lead the boring removal operation by a sufficient distance at all times to minimize differential settlement caused by the creation of voids between the jacking sleeve and the surrounding soil. All such voids shall be filled by pressure grouting.

F. If an obstruction is encountered that prohibits the forward action of the pipe, and it becomes evident that it will be impossible to advance the pipe, operations shall cease and the pipe will be abandoned in place and filled completely with grout. Any such additional cost associated with such a restart at a new location shall be borne by the Contractor.

G. Pipe shall be supported with manufactured stainless steel banded - neoprene casing spacers. Custom spacers may be required to maintain design pipe grades within casing. Shop drawings shall be provided. Salt treated pipe spacers or carrier blocks banded to pipe will only be allowed by written authorization from the Town of Denton or its authorized representative on a case by case basis. Casing and carrier pipes shall be bulkheaded with 12-inches of cement grout at each open end. A 1-inch galvanized steel pipe is to be installed at the invert in the downgrade bulkhead. Alternatively, a manufactured boot, custom fitted for casing and pipe sizes, may be used. Boot shall be securely fastened with Stainless Steel bands for a water tight connection.

H. The Carrier pipe for 8" and larger gravity sewers and all force mains will be Ductile Iron as described in Section 2, Paragraph 2, page 2-1.

I. Steel casing pipes shall have a minimum nominal diameter of double the nominal diameter of the carrier pipe. Thickness shall be that required to meet the existing traffic, overburden and installation loadings shall be a minimum of 0.34 inch and shall conform to ASTM A-53 Grade B. The casing shall be constructed to such line and grade as to ensure installation of the carrier pipe to design grade and elevation as shown on the plans.

J. The jacking operation, once commenced, shall be continuous until such time as the jacked crossing is completed.

6. PLUGGING AND BYPASSING

A. Sewers line sections shall be plugged as necessary to restrict sewer flow during pipeline replacement operations and only under direct supervision of the Town of Denton Department of Public Works.

B. The sewer plug shall be installed upstream of the affected sewer line section. The plug shall be of a design which permits the release of all or any portion of the sewage flow upstream of the plug.

C. The period of time the plug is left in place is to be determined by the Contractor with approval by Town of Denton Department of Public Works. Any damage resulting from flooding of, or backup of sewage into, upstream units is the sole responsibility of the Contractor.

D. The bypassing of sewer flow shall be accomplished as required during plugging operations to protect the sewer lines from damage that might be inflicted by excessive sewer surcharging and to prohibit flooding or damage to public or private property being served by the sewers involved. The Contractor is responsible for all damages.

E. The Contractor shall supply the necessary pumps, conduits, and other equipment for bypass pumping. The bypass system shall be of sufficient capacity to handle existing flows plus additional flow that may occur during periods of inflow. The Contractor will be responsible for furnishing the necessary labor and supervision to set up and operate the pumping and bypassing system. If pumping is required on a 24-hour basis, all engines shall be equipped in a manner to keep the pump noise to a minimum.

F. Standby or reserve pump(s) shall be available at the bypassing site. Capacity of the standby or reserve pump(s) shall be equal to, or greater than, the peak flow of sewage to the sewer line.

G. Bypass discharge piping shall be laid at grade from the manhole upstream of the plug to the first manhole downstream of the plug. All safety precautions such as barricades, flashers, flagmen, etc. shall be provided by and be the responsibility of the Contractor.

H. Upon completion of the bypass operation and disassembly of the bypass equipment, the interior of the manholes from which, and to which, sewage was bypassed shall be flushed.

I. Any spillage from disassembly of equipment or otherwise shall be flushed to the sewer. No discharge of sewage will be permitted during bypassing to any areas than as specified herein.

J. No separate payment shall be made for plugging and bypass operations. The cost for such work shall be included in the appropriate unit price bid for the item of work performed.

7. LAYING PIPE IN FREEZING WEATHER

A. No pipe shall be laid upon a foundation into which frost has penetrated, nor at any time when the Engineer shall deem that there is danger of the formation of ice or the penetration of frost at the bottom of the excavation unless all required precautions as to the minimum length of open trench and promptness of backfilling are observed.

8. ARTIFICIAL FOUNDATION

A. Whenever directed, the Contractor shall lay pipe upon an artificial foundation which he shall construct. Such foundation may consist of gravel, sills, planks, or other timber construction, or of concrete; all to be of the form and dimensions and placed in the manner required by the Engineer. All artificial foundations shall be of a character equal to that as hereinbefore specified.

9. PIPELINE DETECTION SYSTEM

A. Pipeline detectable tape shall be installed continuously along each sewer. The tape shall be installed directly above each pipeline and twelve (12) inches from the ground surface.

B. The tape shall be Lineguard Type II Detectable Tape as manufactured by Lineguard Inc. of Wheaton, Illinois, or equal. The tape shall be a minimum of two (2) inches wide, green in color, imprinted with the words, "CAUTION-SEWER LINE BELOW", and be capable of being detected with inductive methods.

10. TESTING

A. General: The Contractor shall furnish all labor, tools, materials, water, and equipment, including mirrors, flashlights or other artificial lighting, weirs, pump, compressors, stopwatch, gauges, and meters for testing in accordance with these specifications.

B. Leak Testing: Contractor shall conduct leakage tests on all portions of the sewers built under the contract. The Contractor shall furnish all necessary labor and material to perform the tests as specified herein and as directed by the Engineer. The Contractor may use either of the following two leak testing methods.

1. Infiltration/Exfiltration

   a. All sewers above the ground water line will be tested by the exfiltration method. This method will involve plugging the lower manhole and filling the pipe section between manholes with water to a level two (2) feet above the top of pipe in the upstream manhole and measuring the volume of leakage by the drop in manholes. Water for exfiltration tests shall be furnished by the Contractor.

   b. All sewers below the ground water line will be tested by the infiltration method. This method will involve measuring the amount of infiltration into the pipe section at the lower end of the pipe section by means of a weir installed in the pipe or by other means, as approved by the Engineer.

   c. The sewer shall be tested in sections of not more than 1000 feet lengths unless otherwise directed by the Engineer. The section shall be tested immediately upon completion thereof and shall meet the appropriate requirements specified herein.

2. All sheeting shall be removed, backfill placed to finished grade, and dewatering operations ceased at least 72 hours prior to infiltration tests.

3. The Contractor shall replace or repair all visible leaks or defects on all sections of sewers failing to meet the leakage tests.

4. The maximum allowable leakage, as determined by the infiltration or exfiltration method shall be 10 gallons per inch of pipe diameter, per mile, per day (24 hours).

5. Low Pressure Air - The Contractor shall furnish all equipment and personnel to conduct this test in accordance with the following procedure:

   a. All branch fittings and ends of lateral stubs shall be securely plugged to withstand the internal test pressures. The section of line being tested shall also be securely plugged at each manhole. All stoppers shall be adequately braced when required.

   b. Air shall be slowly supplied to the plugged pipe line until the internal air pressure reaches 4.0 pounds per square inch greater than the average back pressure of any ground water that may submerge the pipe. At least two minutes shall be allowed for temperature stabilization before proceeding further.

   c. The rate of air loss shall then be determined by measuring the time

interval required for the internal pressure to decrease from 3.5 to 2.5 pounds per square inch.

d. The line shall be considered acceptable if the time, T, in seconds, required for the 1.0 psi pressure drop is not less than the following:

$$T = 0.0850\ DK/Q$$

Where:

K = 0.000419DL, but not less than 1.0
Q = rate of loss of 0.00015 cu ft/min/sq ft. of internal surface
D = pipe diameter, in.
L = Length of line being tested, ft.

e. See Table 1 below for specification time required for a 1.0 psig pressure drop for size and length of pipe indicated for Q = 0.0015.

Table 1: Specification Time Required for a 0.5 Pressure Drop For Size and Length of Pipe Indicate for Q = 0.0015

1 Pipe Dia. (in.)	2 Min. Time (min:sec)	3 Length for Min. Time (ft)	4 Time for Longer Length (sec)	100 ft	150 ft	200 ft	250 ft	300 ft	350 ft	400 ft
4	1:53	597	0.190 L	1:53	1:53	1:53	1:53	1:53	1:53	1:53
6	2:50	398	0.427 L	2:50	2:50	2:50	2:50	2:50	2:50	2:51
8	3:47	298	0.760 L	3:47	3:47	3:47	3:47	3:48	4:26	5:04
10	4.43	239	1.187 L	4:43	4:43	4:43	4:57	5:56	6:55	7:54
12	5.40	199	1.709 L	5:40	5:40	5:42	7:08	8:83	9:58	11:24
15	7:05	159	2.671 L	7:05	7:05	8:54	11:08	13:21	15:35	17:48
18	8:30	133	3.846 L	8:30	9:37	12:49	16:01	19:14	22:26	25:38
21	9:55	114	5.235 L	9:55	13:05	17:27	21:49	26:11	30:32	34:54

C. Mirror Test of Sanitary Sewers: Upon completion of pipe laying and backfilling to a point at least two (2) feet above the crown of the pipe, the Engineer will conduct a mirror test to check for defects, or leakage, and for horizontal or vertical misalignment. Mirror testing shall consist of reflecting sunlight or artificial light via mirrors through the completed section of pipeline, which, in order to be accepted, shall be true and straight in horizontal and vertical alignment to allow for the full passage of the reflected light.

D. Deflection Testing: Sanitary sewers shall be tested in the presence of the Owner's and the Contractor's representatives to determine the amount of vertical deflection in the completed pipe line as follows:

1. Deflection testing as specified hereinafter shall be accomplished by the Contractor on all sanitary sewers installed.

2. Installation of sanitary sewers shall be complete prior to the start of deflection testing. All sheeting shall be removed except where written approval by the Engineer has been obtained. All backfill shall be placed, consolidated and dewatering operations ceased 14 days prior to the start of deflection testing.

3. One of the following methods of testing shall be utilized:

   a. A mandrel made of steel or aluminum, with a diameter equivalent to 95 percent of the inside diameter of the pipe to be tested shall be pulled through the pipeline, from manhole to manhole, by hand. If the steel ball is unable to pass through the pipe without applying excessive force (as judged by the Engineer), it will be construed as evidence that the pipe has deflected more than 5 percent of the inside pipe diameter. A permanent record of all testing with locations where excessive pipeline deflections occur shall be kept by the Contractor and forwarded to the Engineer after completion of testing on each line. If a mandrel is utilized, it shall be approved by the Engineer prior to use. Mandrels shall have an odd number of gauging plates. The minimum number of plates shall be nine with a contact surface length equal to the inside pipe diameter plus two inches for pipelines 10 inches in diameter and smaller. On larger diameters, the contact surface length shall equal the inside pipe diameter.

   b. A deflectometer or a similar instrument, either of which must be approved for use by the Engineer shall be pulled through the pipeline from manhole to manhole. The instrument shall measure the vertical deflection in the pipeline to the nearest tenth of one percent. A permanent record of all testing with locations where excessive pipeline deflections (greater than 5% of inside diameter of pipe) occur shall be kept by the Contractor and forwarded to the Engineer after completion of testing on each line.

4. The Contractor shall immediately replace all sections of pipe which deflect more than 5 percent as measured by one of the aforegoing methods.

5. All material and labor required for testing and replacement of pipelines shall be furnished by the Contractor and the cost thereof included in the prices bid for furnishing and laying sewers.

11. DEFECTS TO BE MADE GOOD

A. If, at any time before the expiration of the guarantee period under this contact, any broken pipe, or any other defects are found in any of the lines or in any of the appurtenances, the Contractor shall cause the same to be removed and replaced by proper material and workmanship, without extra compensation for the labor and material required, even though such injury or damage may not have been due to any act, default, or negligence on the part of the Contractor. All materials shall be carefully examined by the Contractor for defects prior to installation, and any found defective shall be rejected for use.

END OF SECTION

SECTION 3

SEWER HOUSE LATERALS AND APPURTENANCES

1. GENERAL

A. The Contractor shall furnish and lay, or install, all sewer house service pipes, fittings, and appurtenances in accordance with these specifications and as indicated on Detail Sheets SS-4.00 and SS-4.10.

B. Sewer house service pipes shall be polyvinyl chloride (PVC) pipe or ductile iron (DI) pipe.

C. All parcels whether developed or undeveloped will receive one (1) House Lateral cleanout, unless otherwise directed by the Engineer. House lateral cleanout shall be as detailed on Sheets SS-5.10 and SS-5.20.

D. The use of tee wyes as part of the cleanout is unacceptable.

2. PVC PIPE AND FITTINGS

A. All 6" PVC pipe and fittings shall be SDR 35 with gasket joints and shall comply with PVC pipe requirements of Section 2 – Sanitary Sewers and Appurtenances. All 4" PVC pipe and fittings shall be schedule 40. Saddle fittings and tee wyes shall not be acceptable. Provide all necessary adapters.

B. All PVC pipe joints shall comply with the requirements of Section 2. All pipe shall be jointed in accordance with manufacturer's recommendation and as approved by the Engineer.

3. DUCTILE IRON PIPE AND FITTINGS

A. Ductile iron pipe, for sewer construction, shall be centrifugally cast with push-on joints, not less than 12 feet nor more than 20 feet in length. Ductile iron sewer pipe shall be in accordance with ANSI A21.51 and shall be pressure class 350.

B. Fittings and specials for ductile iron pipe shall be made of cast iron in accordance with ANSI A21.10 and rated for 250 psi working pressure.

C. The weight, class or nominal thickness, and casting period shall be shown on each pipe. The manufacturer's mark, country where cast, year in which the pipe was produced, and the letters "DI" or "DUCTILE" shall be cast or stamped on the pipe. All required markings shall be clear and legible, and all cast marks shall be on or near the bell.

D. All pipe and fittings shall be double cement lined inside and be bituminous coated inside and out per ANSI A 21.4.

4. SELECTION AND ARRANGEMENT

A. The Contractor shall verify all dimensions of fittings, pipe, etc. so that all of the pipe work performed will fit together properly and will conform to the arrangements as shown on the drawings or directed by the Engineer.

5. LAYING PIPE AND FITTINGS

A. Pipe and fittings shall be carefully handled and lowered into the trench. The ends of pipe shall abut against each other in such manner that there shall be no shoulder or unevenness on the inside of the main.

B. Special care shall be taken to insure that the pipes are well bedded on a solid foundation, and any defect due to settlement shall be made good by the Contractor. Bell holes shall be dug sufficiently large to insure the making of proper joints.

C. Proper and suitable tools and appliances for the safe and convenient handling and laying of pipe and fittings shall be used. Care shall be taken to prevent the pipe from being damaged, and any pipe damaged in any way shall be replaced to the satisfaction of the Engineer by the Contractor.

D. Pipe and fittings shall be thoroughly cleaned before they are laid and shall be kept clean until the acceptance of the completed work. At the close of each work day the end of the pipe line shall be tightly closed with an expansion type stopper so that no dirt or other foreign substance may enter the line, and this stopper shall be kept in place until pipe laying is again resumed.

E. Whenever a pipe or fitting requires cutting, to fit into the line or to bring it to the required location, the work shall be done in a satisfactory manner so as to leave a smooth end. Cuttings left in pipe shall be removed before jointing.

F. All house connections shall be laid on a two percent (2%) grade unless otherwise directed by the Engineer.

6. JACKED HOUSE LATERAL INSTALLATIONS

See Section 2, Paragraph 5 - Jacked Installations.

7. PIPE DETECTION SYSTEM

See Section 2, Paragraph 9 - Pipeline Detection System.

8. HOUSE LATERAL CLEANOUTS

A. House lateral cleanouts shall be as detailed on Sheets SS-5.10 and SS-5.20.

9. TESTING

A. The Engineer shall be notified in advance of all tests and all tests shall be conducted to his entire satisfaction.

B. House connections and lateral lines shall be tested by methods specified in Section 2 of these specifications except mirror and deflection testing of sewer house lateral pipe will not be required.

C. Leaks and defects shall be repaired or otherwise remedied by the Contractor at no expense to the Owner and to the complete satisfaction of the Engineer, at whatever time they become apparent prior to the expiration of the guarantee period under this contract.

END OF SECTION

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SECTION 4

SANITARY SEWER MANHOLES AND CLEANOUTS

1. GENERAL

A. The Contractor shall construct manholes of precast reinforced concrete risers and base sections where indicated and as detailed on Sheets SS-2.00 thru SS-2.20. The Contractor will not be allowed to field cut, break, or core pipe openings through precast manhole walls without prior approval from Engineer.

B. Manholes shall be built at such points on the pipelines and of such form and dimensions as are shown on the drawings or as may be directed. Manholes shall be built as pipe laying progresses and the Engineer may stop work entirely on laying pipe if manhole construction is delayed to such an extent as to be hazardous to construction or the public.

C. Manholes with more than three connections, pipes 24" or more in diameter, or drop connections shall have an inside diameter of 5 feet. All other manholes are to have an inside diameter of 4 feet.

D. Doghouse type manholes shall be used to facilitate connection of proposed sewers to existing sewers, where directed, and shall be of such form and dimensions as are shown on the drawings.

E. Distance between manholes shall not exceed 400 LF without Engineers approval.

2. PRECAST REINFORCED CONCRETE MANHOLE SECTIONS

A. Precast reinforced concrete risers, eccentric cones (use of slab tops subject to Engineer’s approval or where shown on Drawings) and bases shall be as detailed on Sheet SS-2.00 - SS-2.20 and in conformance with ASTM Designation C 478. Joints between riser sections shall be fitted with a D-Lok manhole joint gasket meeting the requirements of ASTM Designation C 443.

B. Precast reinforced concrete base and riser sections shall be as manufactured by Atlantic Precast Concrete Corporation, Gillespie Precast Inc., or equal. Base section shall be manufactured using a monolithic pour.

C. Interior and exterior joint spaces of all manhole risers shall be mortared.

D. Lifting holes in the walls of precast reinforced concrete risers will be allowed. The lifting hole is to be formed by a plastic insert cast integrally into the manhole wall, to

assure water tightness. The hole is to be grouted flush with face of manhole wall after installation of manhole riser sections. Not more than two holes shall be cast in the walls of each riser section for the purpose of handling. Said insert is to be "Key-Lok" as manufactured by A-Lok Products or equal.

E. The manhole manufacturer is to identify all inlets and the outlet of each manhole. An "I" and an "O" painted over the hole will be acceptable.

3. CONNECTIONS AND STUBS

A. All pipe-to-manhole connections shall be made by means of an integrally cast flexible connector which shall be A-Lok flexible manhole gasket as manufactured by A-Lok Corp., Trenton, New Jersey, or equal. The pipe-to-manhole seal shall be accordance with ASTM C-923.

B. Stub connections shall be constructed where indicated on the plans of the same material used for sewer construction and shall extend 4 feet in length outside of manhole wall. The outer end of the stub connection shall be plugged with an approved stopper, secured in place as directed.

4. BRICK

A. Brick work shall be limited to flow channel and bench construction and frame adjustment courses. No other brick shall be used in manhole construction.

B. All brick shall conform to the "Standard Specifications for Sewer Brick," ASTM Designation C 32, Grade SS, except that the maximum absorption for the average of five bricks shall not exceed 10 percent; and the individual brick maximum shall not exceed 14 percent.

5. MORTAR

A. Cement shall be in accordance with the "Standard Specifications for Portland Cement," ASTM Designation C 150 for Type II.

B. Sand shall be composed of sharp, angular, silicious grains, coarse, or graded from fine to coarse with the coarsest grains predominating, and sensibly free from clay, loam, dirt, mica, organic matter, or other impurities. Sand containing more than 5 percent by weight of foreign material shall not be used. This limit may be changed for special classes of work if hereinafter specified. Sand exhibiting more than an acceptable amount of fine matter or impurities may be required to be washed after delivery on the work or shall be rejected altogether. Sand for mortar shall be screened to reject all particles of a greater diameter than 1/4-inch and shall not contain more than 5 percent by weight of a very fine material.

C. Unless hereinafter specified otherwise, all mortar shall be composed of cement and sand of the character above specified. The proportion by volume shall be one part of cement to two of sand. One volume of cement shall be 94 pounds net. One volume of sand shall be 0.9 cubic feet, the sand not being packed more closely than by throwing it into a box in the usual way. Mortar shall be fresh mixed in small batches for the work in hand. Tight boxes or platforms made for the purposes shall be used. The sand and cement shall be thoroughly mixed dry, in the proper proportions, until a uniform color has been produced, whereupon a moderate dose of water shall be added, so as to produce a stiff paste of the proper consistency.

D. Sand obtained from the excavation shall not be used.

6. LAYING BRICK

A. All brickwork shall be laid by competent mechanics.

B. All brick shall be laid in a full bed of mortar with all vertical and horizontal joints filled solid with mortar.

C. Joints shall be not less than 3/8-inch or more than 1/2-inch wide.

D. No brickwork shall be laid when the temperature is below 40 degrees or when the indications are for lower temperatures within 24 hours. The Contractor shall take such measures as may be approved to prevent brickwork from being exposed to freezing temperatures for a period of not less than five days after laying.

7. FLOW CHANNELS

A. All manhole flow channels and benches shall be constructed of pre-cast concrete with care taken to secure smooth and even surfaces. Channel sections shall be built up to true line and radius, and curved sections shall provide a uniform transition in the flow direction. Flow channels shall be in accordance with Detail Sheet SS-2.40.

B. Materials and construction of flow channels shall be in accordance with appropriate sections for materials so used, as hereinafter specified.

8. DROP CONNECTIONS

A. Drop connections shall be of the inside drop manhole type and shall be constructed as detailed on Sheet SS-2.10.

B. Drop connections shall be required where a vertical invert difference of greater than or equal to two (2) feet exists between influent and effluent sanitary sewers. Where the difference in elevation between incoming sewer and the manhole invert is less than 24 inches, the invert should be filleted to prevent solids deposition.

C. Nominal diameter of the drop connection and fitting shall be equal to the influent pipe diameter.

D. Stainless steel straps shall be bolted to the manhole wall in such a manner as to allow for future removal and replacement of drop sections. Straps shall be located within six (6) inches below each joint and at a minimum of three (3) feet on center elsewhere.

E. All joints for drop sections shall be rubber gasketed or friction type to facilitate future removal. Solvent weld joints will not be permitted.

9. MANHOLE STEPS

A. Manhole steps shall be made of 1/2 inch diameter steel reinforcing rod, ASTM Designation A 615, Grade 60, encased in polypropylene plastic. Manhole steps shall have a notched tread ridge with retainer lug on each side.

B. Manhole steps shall be cast in place during manufacture of precast reinforced concrete risers and eccentric top sections. Embedment length shall be suitable for minimum 5 inch thick, precast reinforced concrete riser walls.

C. Manhole steps shall be spaced 12 inches apart. The maximum spacing from top of manhole to the first step shall not exceed 16 inches.

D. Manhole steps shall be OSHA approved and Model PS1 as manufactured by M.A. Industries, Inc., Peachtree City, Georgia, ICM, Inc., Jacksonville, Arkansas, or equal.

10. WATERPROOFING

A. The exterior surface of all manholes shall receive a minimum two coat application of a coal tar type protective coating. The total average dry film thickness shall measure 24 mils with no single measurement to be less than 20 mils. Surfaces shall be prepared in accordance with the manufacturer's instructions and coatings applied in the factory in a manner acceptable to the Engineer. The coating material shall be Seaboard LN-12 Asphalt Gilsonite Paint as manufactured by Seaboard Asphalt Products, Baltimore, Maryland, or equal.

11. MANHOLE FRAMES AND COVERS

A. Frames and covers for manholes shall be set by the Contractor as the work progresses. The frame shall be well bedded in mortar. Frame and covers shall be securely fastened to the top cone with bolts securely anchored.

B. Material for frames and covers shall be in accordance with the standard specifications for gray iron castings ASTM Designation A 48 for Class No. 30.

C. Frames shall be East Jordan Iron Works (EJIW) 154514 and covers shall be EJIW 15423 or Neenah R-1565 frame and cover or approved equal. Covers shall be labeled "Sanitary Sewer". Reference Detail Sheet SS-2.50.

12. INFILTRATION PREVENTION

A. Contractor shall furnish and install manhole frame internal sewer guards as shown on Detail Sheet SS-2.60. The guards shall be made of non-corrosive materials and shall be positioned completely inside the manhole frame to the top of manhole cone. Sewer guards shall be Flexi Rib Seals as manufactured by Parson Environmental Products, Wernersville, Pennsylvania, or equal.

B. Contractor shall furnish and install watertight manhole inserts at all sanitary sewer manholes. The inserts shall be made of non-corrosive materials and shall be constructed so that the manhole cover can be removed without damage to air and vacuum relief valves mounted on the inserts. Inserts shall be Parson Model V2P by Parson Environmental Products, Wernersville, Pennsylvania, or equal. Reference Detail Sheets SS-2.50 and SS-2.60.

13. CLEANOUT FRAMES & COVERS

A. Cleanout frames and covers shall be cast iron, watertight with recessed lifting holes as manufactured by East Jordan Iron Works Model 1566 for 6” or 1564 for 8” or equal, and as shown on Detail Sheet SS-3.10. Cleanout lid shall be marked “S”.

END OF SECTION

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SECTION 5

PRECAST CONCRETE GREASE TRAP

1. GENERAL

A. The Contractor shall provide all materials, labor, equipment, and services necessary to construct and install precast concrete grease trap as shown on Sheet SS-8.00 and in accordance with these specifications.

B. Grease traps shall be constructed of precast reinforced concrete. Tanks shall be watertight, non-corrosive, durable and structurally sound. All inlet and outlet connections shall be sealed with standard rubber gaskets.

C. Each grease trap shall be equipped with two concrete extension rights and cast iron manhole frame and cover as shown on Sheets SS-8.00 and SS-3.00.

2. PRECAST REINFORCED CONCRETE GREASE TRAP

A. Precast reinforced concrete grease traps shall be as detailed on Sheet SS-8.00 and shall be sized in accordance with Caroline County Health Department requirements. Traps shall be in accordance with applicable sections of ACI 318 and shall be designed to carry AASHTO HS 20-44 loads.

B. Concrete for precast reinforced grease trap shall consist of the specified portland cement, aggregates, admixtures, and water to produce the following properties:

1. Compressive Strength: 5,000 psi minimum at 28 days.

C. Concrete shall be placed in a continuous operation to prevent the formation of seams or planes of weakness and shall be thoroughly consolidated by internal and external vibration without dislocation damage to reinforcement.

D. Concrete shall be cured by steam in other suitable methods to secure 5,000 psi minimum at 28 days as indicated by compression cylinder tests (ASTM C 39).

E. Materials for use in manufacturing precast reinforced concrete grease traps shall be as follows:

1. Portland Cement: ASTM C 150, Type II
2. Aggregates: ASTM C 33
3. Water: Clean, fresh, potable
4. Air-Entraining Admixture: ASTM C 260

5. Water-Reducing Admixture: ASTM C 494, Type A
6. Reinforcing: ASTM A 615, Grade 60, deformed

F. Contractor shall provide shop drawings showing complete information for the fabrication and installation of precast units as well as indicating dimensions and cross sections, location, size, and type of reinforcement.

G. Grease traps shall be as manufactured by Rotondo/Penn-Cast, Inc, Telford, PA 18969, or equal.

3. INSTALLATION

A. The excavation shall be large enough to allow safe, unencumbered working conditions, but in no case shall be less than two (2) feet beyond the tank perimeter. Excavations shall be free of standing water until backfilling is complete.

B. The grease trap shall be placed on undisturbed soil with a six (6) inch gravel bedding which has been leveled.

C. All grease traps shall be placed at a depth as shown on the Drawings.

D. Excavated material may be used for backfill provided that it meets the requirements in Section 1 - EXCAVATION, BACKFILL AND SURFACE RESTORATION.

E. Backfill materials shall be placed in uniform layers not more than eight (8) inches thick and compacted to not less than 95% of its maximum dry density. Tamping shall be done in a manner which will not produce undue stress or strain on the tank. Backfilling
machinery shall not be permitted within five (5) feet of the excavated area.

END OF SECTION

SECTION 6

FORCE MAINS AND APPURTENANCES

1. GENERAL

A. The Contractor shall furnish, lay, and test, all force main pipe, fittings, and appurtenances in accordance with these specifications and as indicated on the plans.

B. Force main pipe shall be polyvinyl chloride, high-density polyethylene PE4710, or ductile iron pipe. Size and wall thickness specifications shall be in accordance with approved drawings.

2. POLYVINYL CHLORIDE PLASTIC PIPE AND FITTINGS

A. Polyvinyl chloride plastic pipe used for force main construction shall meet or exceed the requirements of C909 (DR18 and colored green), or ASTM D2241, SDR-21 pressure Class 200. Pipe shall be manufactured in lengths not exceeding 20 feet.

B. Polyvinyl chloride pipe shall be manufactured with integral wall bell and spigot joints which shall utilize a flexible O-ring rubber gasketed joint meeting the requirements of ASTM F 477. Pipe ends shall be beveled to accept gasketed fitting.

C. Each pipe section including bell or coupling shall be tested in accordance with conditions specified in ASTM D 618 and D 2241. Any pipe that leaks or is unable to withstand the test pressure shall be rejected. The test shall be conducted at the factory and certification stating that the operation has been conducted as specified and the pipe meets all conditions of this specification shall be submitted to the Engineer.

D. Polyvinyl chloride pipe shall be delivered and stockpile in unit pallets. Store pipe on flat surface. No stacking of pallets or random lengths above 5 feet in height will be allowed. If pipe is stockpiled for more than 30 days prior to installation in the trench, it must be suitably covered with reflective materials to protect the pipe from ultra-violet rays emanating from sunlight. Do not use plastic sheets. Allow for air circulation under covering.

E. Bowed sections of pipe will be unacceptable and installation of pipe which has bowed, whether or not the bow has been corrected, will not be allowed on this project.

F. All fittings and specials to be used for polyvinyl chloride pipe shall be of ductile iron with mechanical joints per AWWA C-110 and C-153.

3. HDPE PIPE AND FITTINGS

A. HPDE pipe and fittings sizes 1” thru 4” IPS diameters shall be supplied in accordance with AWWA C-901-17, or the latest version thereof and to the requirements of ASTM D3035.

B. The high-density polyethylene pipe and fittings shall be PE 4710. The pipe shall conform to ASTM 3350 with a cell classification of 445474C. All HDPE pipe less than 4-inch diameter shall be as manufactured by JM Eagle or approved equal, where Iron Pipe Sizes (IPS) are required. All wall stops for concrete thrust collars shall be manufactured by JM Eagle or approved equal.

C. The pipe, fittings and specials shall be from the same manufacturer. All fittings and specials shall have the same pressure rating as the pipe.

D. All pipe and fittings joints shall be fully restrained from movement due to thermal expansion/contraction forces.

E. The Contractor shall be permitted to arc the pipe in lieu of utilizing fittings for bends. The minimum bending radius and other pipe installation requirements shall be as recommended by pipe manufacturer.

F. Joints for the pipe and fittings shall be by butt fusion joining techniques in accordance with the manufacture's recommendations. Where joining pipe is required within the trench, electrofusion techniques may be used in lieu of butt fusion. Electrofusion couplings and saddles may be used where necessary. All Electrofusion couplings shall be made using a computer controlled automatic electrofusion system. The electrofusion system shall consist of couplings containing an integral heating source which is computer controlled for time, temperature, and jointing pressure for a consistent joint. Couplings shall be rated for the same working pressure as the pipe and shall have a built-in identification feature to automatically set fusion times. The electrofusion system shall include a current monitoring feature. All joints shall be made in accordance with the manufacturer's instructions.

G. Transition fittings shall be Polypropylene Compression Fittings suitable for use on HDPE and PVC pipe. Fittings shall be long term rated for 230 psi complying with ISO 14236 and meet the dimensional and performance requirements of AWWA C800 Fittings shall comply with NSF 61 and shall be “listed” by NSF. Fitting “Bodies” shall be Polypropylene. Fitting “Compression Nuts” shall be Acetal. Joint seal activation shall be accomplished solely by the Compression Nut. Joint “Seals” shall not “interfere” with pipe insertion. No beveling or lubrication of pipe shall be required. Fitting components shall not require dismantling prior to assembly on to pipe. Fittings shall be “3G” or “UTC” with “Slide & Tighten capability as manufactured by Philmac Pty Ltd. and represented by The Harrington Corporation (Harco) of Lynchburg, VA (434) 845-7094.

4. DUCTILE IRON PIPE AND FITTINGS

A. Ductile iron pipe shall have gasketed, mechanical joint or push-on (Tyton) joints, conforming to ANSI Standard A 21.51. It shall be Class 50 unless otherwise noted or directed by the Engineer. All fittings shall be made of cast iron in accordance with ANSI A 21.10 and rated for 250 psi working pressure. Fittings shall be provided with mechanical joint ends in accordance with ANSI A 21.11 except where noted on the plans or delineated in these specifications. All pipe and fittings shall be double cement-lined inside and bituminous coated inside and outside per ANSI A 21.4.

5. AIR RELIEF VALVES

A. Air vacuum relief valves shall be constructed of cast iron or composite body and cover, stainless steel trim and float, and shall have 2" N.P.T. inlet. Valves shall be APCO Model No. 400-Short Body as manufactured by the Valve and Primer Corporation, Chicago, Illinois, or A.R.I. Model No. D-025 as manufactured by A.R.I. USA in care of Rockacy and Associates, Charlottesville, Virginia or equal, suitable for sewage force main applications with working pressures to 150 pounds per square inch and sized for the specific application by the engineer of record.

6. AIR RELEASE MANHOLES

A. Air Release Manholes shall be located at high points and as required for long flat sections on the Force Mains and at such forms and dimensions as are shown on the Detail Sheet SS-7.20 or as may be directed.

B. Precast reinforced concrete manhole sections shall conform with Section 4, Paragraphs 2.A thru 2.D.

C. Manhole Steps shall conform with Section 4, paragraph 9.

D. Manhole Frame and Cover shall conform with Section 4, paragraph 11.

E. Tapping sleeves shall be manufactured of ductile iron, cast iron, or stainless steel and shall have a 2” N.P.T threaded outlet. Tapping sleeve shall be PowerSeal Model 3495AS as manufactured by PowerSeal Pipeline Products Corp., Wichita Falls, Texas or equal.

F. Isolation valve shall be a 2” stainless steel ball valve with hand actuator. Valve shall be FNW Model No. 310A as manufactured by FNW Corp., Portland, Oregon or equal.

7. FORCE MAIN DISCHARGE MANHOLE

A. Force main discharge manholes will be as detailed on Detail Sheet SS-7.10 and shall be constructed at locations designated on the plans.

8. BUTTRESSING BENDS

A. Concrete for buttresses on sanitary sewer force main pipe shall be 3000 psi concrete using Type II Portland Cement and shall be placed as directed and/or shown on Detail Sheets W-6.00 thru W-6.10.

9. LAYING PIPE, VALVES AND FITTINGS

A. Pipe installation shall be as specified under Section 2 or as detailed on the plans.

B. Pipes shall be thoroughly cleaned before they are laid and shall be kept clean until acceptance of the competed work.

10. PIPELINE DETECTION SYSTEM

A. Pipeline detectable tape shall be installed continuously along each force main. The tape shall be installed directly above each pipeline and twelve (12) inches from the ground surface.

B. The tape shall be Lineguard Type II Detectable Tape as manufactured by Lineguard Inc., of Wheaton, Illinois, or equal. The tape shall be a minimum of two (2) inches wide, green in color, imprinted with the works "CAUTION-SEWER LINE BELOW" and be capable of being detected with inductive methods.

C. Pipeline tracer wire shall be #8 AWG (0.1285” diameter), hard drawn, high carbon 1055 grade, extra-high strength solid copper-clad steel conductor rated at 30 volts, insulated with a 45 mil, high density, high molecular weight polyethylene (HDPE) insulation (green in color) rated for direct burial use at 600 volts. Tracer wire shall be installed with sufficient length inside valve boxes and valve pits for connection at ground surface. Tracer wire shall be by Copperhead Industries, Monticello, Minnesota, or equal.

11. TESTING

A. The Contractor shall furnish all labor, tools, materials, including water, and equipment, including pumps, compressors, stopwatch, gauges, and meters for testing in accordance with these specifications.

B. The Engineer shall be notified in advance of all tests, and all tests shall be conducted to his entire satisfaction.

C. The force main shall be filled with water, supplied by the Contractor, and the pressure raised to obtain a minimum test pressure measured at the highest point of the section of pipeline under test. Particular care shall be taken to eliminate all air from the pipeline. The force mains shall be subject to a leakage test at the specified test pressure, measured at the highest point of the section of pipeline under test. This test shall be a minimum of four (4) hours duration during which time the leakage shall not exceed 25 gallons per inch diameter per mile per 24 hours. The Contractor shall make any and all repairs at his expense that may be necessary until the leakage test requirements have been met.

D. The test pressure for the force mains shall be 100 psi.

E. Leaks and defects shall be repaired or otherwise remedied by the Contractor at no expense to the Owner and to the complete satisfaction of the Engineer, at whatever time they become apparent prior to the expiration of the guarantee period under this contract.

F. The Contractor shall coordinate with the Owner to tone all detection wire after final pressure testing has been completed. All inadequacies in the tracing wire shall be immediately repaired by the Contractor at his expense to the complete satisfaction of the Engineer.

12. DEFECTS TO BE MADE GOOD

A. If, at any time before the expiration of the guarantee period under this contract, any broken pipes, or any other defects are found in any of the lines or in any of their appurtenances, the Contractor shall cause the same to be removed and replaced by proper material and workmanship, without extra compensation for the labor and material required, even though such injury or damage may not have been due to any act, default or negligence on the part of the Contractor. All materials shall be carefully examined by the Contractor for defects, before placing, and any found defective shall not be placed in the line.

END OF SECTION

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SECTION 7

WATER MAINS AND APPURTENANCES

1. GENERAL

A. The Contractor shall furnish and install all water mains, valves, hydrants, fittings, corporation stops, house service piping and appurtenances as specified herein and as defined on the drawings or as directed by the Engineer. Provide all necessary adapters for connection to existing mains. The contractor is given the option of using PVC or ductile iron pipe under this contract except as required by railroad or State Highway permits or as noted on the contract drawings.

2. POLYVINYL CHLORIDE (PVC) PIPE AND FITTINGS

A. Polyvinyl chloride (PVC) plastic pipe used for water main construction shall meet or exceed the requirements of AWWA C900 (4”-12”) and C905 (16”-24”) latest editions. It shall have outside diameters equal to ductile iron pipe with a standard dimension ratio (SDR) of 18. The pipe shall be rated for a working pressure of at least 235 psi and shall have a minimum ultimate hydrostatic strength of 600 psi.

B. Polyvinyl chloride pipe and fittings shall be manufactured with integral wall bell and spigot joints which shall utilize a flexible O-ring rubber gasketed joint conforming to ASTM F 477. Pipe ends shall be beveled to accept gasketed fittings.

C. Pipe shall be Blue in color and shall be NSF-61 and UL 1285 approved. Pipe shall be manufactured in lengths not to exceed 20 feet.

D. Each pipe section including bell or coupling shall be subjected to a hydrostatic test of not less than 500 psi for at least 10 seconds. Pipe shall be tested in accordance with conditions specified in ASTM D 618. Any pipe that leaks or is unable to withstand the test pressure shall be rejected. The test shall be conducted at the factory and certification stating that the test has been conducted as specified and the pipe meets all conditions of this specification shall be submitted to the Engineer.

E. All fittings for PVC water pipe shall be mechanical joint ductile iron per ASTM A536. Fittings 2-inch thru 24-inch diameter shall have a pressure rating of 350 psi and all fittings larger than 24-inch diameter shall have a pressure rating of 250 psi. Mechanical joints shall meet requirements of AWWA C153 and ANSI A21.53. Provide all joint accessories, as required, to connect with plain end of push-on joint pipe or cut pipe. Fittings shall be asphaltic coated outside, and cement lined with double thickness and seal coated inside in accordance with AWWA C104.

F. Polyvinyl chloride pipe specified herein is manufactured to ductile iron pipe size. However, if adapters for connecting polyvinyl chloride pipe to cast iron fittings and valves are necessary, they shall be of the type recommended by the pipe manufacturer. Adapters must be manufactured of material specified herein or approved by the Engineer. Furnishing and installing adapters shall be included in the unit prices bid for the pipe.

G. Polyvinyl chloride pipe shall be delivered and stockpiled in unit pallets, and stored on a flat surface. No stacking of pallets above 5 feet in height will be allowed. If pipe is stockpiled for more than 30 days prior to installation in the trench, it must be suitably covered with reflective materials to protect the pipe from ultra-violet rays emanating from sunlight. Do not use plastic sheets. Allow for air circulation under covering.

H. Bowed sections of pipe will be unacceptable and installation of pipe which has bowed, whether or not the bow has been corrected, will not be allowed.

3. DUCTILE IRON PIPE AND FITTINGS

A. Ductile iron pipe shall be manufactured in accordance with AWWA C151, latest edition, and shall be pressure Class 3 with Tyton Joints. The Contractor shall have the option of furnishing mechanical or push-on joints conforming to the latest edition of AWWA C111.

B. Pipe and fittings shall have a standard exterior asphaltic coating approximately 1 mil thick per AWWA C151.

C. Pipe and fittings shall have an internal cement lining, double thickness, in accordance with AWWA C104. Internal lining must be NSF/ANSI 61 certified for drinking water.

D. All fittings shall be ductile iron, mechanical joint, and shall conform to Section 6, paragraph E.

4. GATE VALVES

A. Gate valves shall be iron body, resilient seated, non-rising stems, mechanical joint ends, square nut operated, and shall open by turning counterclockwise.

B. Gate valves shall be in conformance with AWWA C-515, latest edition, and be rated for 350 psi max working pressure with 10 mils Pro-Guard fusion Bonding.

C. Gate valves shall be as manufactured by Mueller Co. Model A-2361, or equal.

5. VALVE BOXES

A. Valve boxes shall be cast iron, three piece Buffalo screw type with 5-1/4 inch shafts and No. 6 round bases. Valve boxes shall be adjustable between the limits of 2'-4" and 3'-4". If necessary, the water main shall be lowered to provide adequate depth of installation of the valve box.

B. Lids shall be extra deep with two holes and the word "WATER" cast in the upper surface.

C. Valve box assemblies shall be as manufactured by Mueller, Model H-10357 or approved equal.

6. FIRE HYDRANTS

A. Fire hydrants shall be per Town of Denton standards and shall be a traffic model compression type with 5-1/4" main valve opening, on 4-1/2" pumper nozzle and two 2-1/2" hose nozzles. Hydrants shall have a 6" side inlet mechanical joint shoe connection to accommodate the class of pipe hereinbefore specified. Depth of bury shall be suitable for a minimum trench depth of 4"-0".

B. Hydrants shall conform with AWWA Specification C-502, latest edition and as shown on Detail Sheet W-5.00. Hydrant seat shall be provided with bronze to bronze threaded connection.

C. Threading of pumper and hose nozzles shall conform to National Standard. Hydrants shall open by turning counter-clockwise (open left) and shall comply with AWWA specifications for the hydrant type specified. A certificate of inspection and test shall be furnished including submission of a flow and friction loss curve.

D. The operating nut shall be pentagon shape measuring 1-1/2" National Standard point to flat.

E. Non-kinking hose nozzle chains are required.

F. Hydrants shall receive prime and shop coats of paint at the factory. Submit coating specifications for approval. Color of coating for hydrants shall be Safety Yellow. The Contractor shall be responsible within the prices bid for field touch up or repainting of hydrants as required.

G. The entire hydrant assembly, including the valve seat and all moving parts, shall be removable form the top without the need to excavate and/or remove the hydrant.

H. The design shall be such that lubrication of the operating threads is possible without disassembly.

I. Drain mechanisms shall be bronze to bronze to preclude galvanic corrosion of dissimilar metals and shall operate automatically with the opening and closing of the main valve.

J. Fire hydrants shall be Model B-62-B as manufactured by American-Darling Valve and Manufacturing Company or approved equal.

K. Hydrant Steamer Adapter shall be Model HPHA50-45NH/CAP, Storz 5" x 4 ½" NH Female with (2) setscrews, Storz Cap and SS Cable as manufactured by Harrington, Inc., Erie, PA or approved equal.

L. Provide operating wrenches and repair kits as specified by the Owner. Storz cap requires a Storz spanner wrench for removal.

7. LAYING WATER MAIN AND FITTINGS

A. PVC pipe shall be installed in accordance with AWWA C 605, latest revision. Pipe and fittings shall be carefully handled and lowered into the trench. The ends of pipe shall abut against each other in such manner that there shall be no shoulder or unevenness on the inside of the main.

B. Use lubricants specified and supplied by pipe manufacturer and approved for water service for proper pipe joint installation.

C. Special care shall be taken to ensure that the pipes are well bedded on a solid foundation, and any defects due to settlement shall be made good by the Contractor at his own expense. Bell holes shall be dug sufficiently large to insure the making of proper joints.

D. Proper and suitable tools and appliances for the safe and convenient handling and laying of pipes and fittings shall be used. Care shall be taken to prevent the pipe wall from being damaged, and any wall damage shall be repaired to the satisfaction of the Engineer by the Contractor.

E. Pipe and fittings shall be thoroughly cleaned before they are laid and shall be kept clean until the acceptance of the completed work. At the close of each workday, the end of the pipeline shall be tightly closed with an expansion type stopper or plug so that no dirt or other foreign substance may enter the line, and this stopper or plug shall be kept in place until pipe laying is again resumed.

F. Whenever a pipe or fitting requires cutting, to fit into the line or to bring it to the required location, the work shall be done in a satisfactory manner so as to leave a smooth end, and without extra compensation. Polyvinyl chloride pipe shall be beveled in accordance with manufacturer's recommendation before making pipe joint.

G. In jointing pipe and fittings, the Contractor shall exercise particular care to ensure that the outside of the spigot and inside of the bell are entirely free of oil, tar, and greasy substances to insure a tight fit.

H. All concrete required to construct buttresses behind plugs, tees, bends and other fittings and anchorages above or beneath vertical bends shall be placed as directed and/or as shown on Detail Sheets W-6.00 and W-6.10. Concrete shall be 3,000 psi, with Type II Portland cement. The cost of concrete buttressing shall be included in the appropriate unit prices bid for furnishing and laying water main.

I. When indicated or as noted on the Drawings, water pipe shall be encased with 3,000 psi concrete, with Type II Portland cement.

8. INSTALLING FITTINGS, HYDRANTS, GATE VALVES AND VALVE BOXES

A. Fittings, hydrants, gate valves and valve boxes shall be placed along the water mains at the locations indicated on the drawings or where otherwise designated by the Owner or Engineer.

B. A valve box shall be carefully placed over the bonnet of the gate valve with the top at the finished grade of the ground elevation or at such other elevation as the Owner or Engineer shall direct. It shall be set plumb. In tamping the backfill around the box, special care shall be taken to keep the box plumb and to have it firmly supported so as to avoid settlement. Any box which is found out of plumb, or which is not firmly supported, shall be excavated and reset in a satisfactory manner, at the Contractor's expense. Box shall be firmly supported on two 4-inch solid concrete blocks so as to avoid settlement.

C. Hydrant assemblies shall include connecting pipes, fittings, valve and valve box and hydrants. Ductile iron pipe with cast iron fittings shall be used exclusively throughout the assembly. The use of other pipe materials will not be permitted in construction of any portion of the hydrant assemblies.

D. All exterior bolts and nuts to be 316 stainless steel, epoxy coated interior and exterior, UL listed, FM approved.

9. JACKED INSTALLATIONS

A. At the locations, and to the limits indicated on the plans, and where stipulated in permits issued by governing agencies, pipe shall be installed using the "dry-cased" method of jacked construction. Open cut construction will not be permitted at these locations. Jacked installations shall conform to Section 2, paragraph 5.

10. STERILIZATION OF WATER MAINS

A. The Contractor shall disinfect all water mains in accordance with AWWA Standard C 651, latest edition.

B. The Contractor shall submit a chlorination plan at the preconstruction meeting for the Engineers approval.

C. All water for disinfection and filling of mains and appurtenances shall be provided by the Contractor at no additional cost to the owner.

D. The Owner shall select, employ, and pay for an independent testing agency to perform residual and bacteriological analyses of all disinfected mains.

E. Contractor shall notify the Engineer when chlorination is completed and ready to have bacteriological and residual samples taken.

F. Samples shall indicate a chlorine residual that is in the range of 0.2 mg/l to 1.0 mg/l.

G. Should residual and bacteriological analyses be unsatisfactory to the Engineer, the Contractor shall re-chlorinate the main and notify the Engineer to take new samples. Re-chlorination including cost of taking samples shall be at the Contractor's expense.

H. Water mains shall not be placed in service until the analysis is complete and approved by the Engineer.

11. TESTING

A. The Contractor shall furnish all labor, tools, materials, including water, and equipment, pumps, compressors, stopwatch, gauges, and meters, subject to the approval of the Engineer and Inspection Agency, for testing and/or replacement/repair of pipe in accordance with these specifications.

B. The Contractor shall perform all testing and/or replacement/repair of the pipe in the presence of the Owner, Engineer, or designated representative. The cost for the Contractor's testing procedures shall be included in the prices bid for furnishing and laying water mains.

C. The Owner, Engineer or Inspection Agency shall be notified in advance of all tests, and all tests shall be conducted to their entire satisfaction. All tests shall be conducted in the presence of the Inspection Agency.

D. Pressure Test:

1. After backfilling has been completed, all newly laid pipe and any valved section thereof shall be subject to a hydrostatic pressure test of 2-times the operating pressure of existing system and shall retain this pressure for a period of two hours without leakage. The procedure for the pressure test shall be as follows:
   a. Each valved section of pipe shall be slowly filled with water and the specified test pressure shall be applied by means of a pump connected to the pipe in a manner satisfactory to the Engineer and Inspection Agency.

   b. Before applying the specified test pressure, all air shall be expelled from the pipe. If permanent air vents are not located at all high points, the Contractor shall install corporation stops at such points so the air can be expelled.

E. Leakage Test:

1. After satisfactory completion of the pressure test, the Contractor shall conduct a leakage test. The Contractor shall furnish the gauge and measuring device for the leakage test. The Contractor shall furnish the pump, pipe connections, and other necessary apparatus. Leakage shall be defined as the quantity of water that must be supplied into a newly laid pipe or any valved section, to maintain the specified leakage test pressure.

2. After the air in the pipeline has been expelled and the pipe has been filled with water, the allowable leakage shall be not more than 25 gallons of water per inch diameter per mile per 24 hours at a pressure of 2-times the operating pressure of existing system, measured at the highest line elevation. Leakage test shall be carried out for not less than four hours duration and the allowable leakage prorated accordingly.

F. Should either test shown the main to be defective, the Contractor shall remedy such defects and retest the main as specified above. This procedure shall be repeated until the test requirements are met. Contractor is to bear full responsibility and cost for testing, repair, replacement, and retesting, at no additional cost to the Owner.

12. LAYING PIPE IN FREEZING WEATHER

A. No pipe shall be laid upon a foundation into which frost has penetrated, nor at any time when the Engineer shall deem that there is danger of the formation of ice or the penetration of frost at the bottom of the excavation, unless all required precautions as to the minimum length of open trench and promptness of refilling are observed.

13. ARTIFICIAL FOUNDATION

A. Whenever directed, the Contractor shall lay pipe upon an artificial foundation which he shall construct. Such foundation may consist of gravel or concrete, all to be of the form and dimensions, and placed in the manner required by the Engineer. All necessary excavation for the construction of artificial foundations shall be made by the Contractor.

14. PIPELINE DETECTION SYSTEM

A. Pipeline detection tape shall be installed continuously along all water mains. The tape shall be installed directly above the water mains and twelve inches from the ground surface.

B. The tape shall be Lineguard Type III Detectable Tape as manufactured by Lineguard, Inc., of Wheaton, Illinois, or equal. The tape shall be a minimum of two inches wide, blue in color, imprinted with the words, "CAUTION--WATER LINE BELOW", and be capable of being detected with inductive methods.

B. Pipeline tracer wire shall be #8 AWG (0.1285” diameter) hard drawn, high carbon 1055 grade, extra-high strength solid coper-clad steel conductor rated at 30 volts, insulated with a 45 mil, high density, high molecular weight polyethylene (HDPE) insulation (blue in color) rated for direct burial use at 600 volts. Tracer wire shall be installed with sufficient length inside valve boxes and meter pits for connection at ground surface. Tracer wire shall be by Copperhead Industries, Monticello, Minnesota, or equal.

15. DEFECTS TO BE MADE GOOD

A. If, at any time before the final acceptance of the contract, any broken pipes, or any defects, are found in the water mains or in any of their appurtenances, the Contractor shall cause the same to be removed and replaced with proper material and workmanship, without extra compensation for the labor and material required, even though such injury or damage may not have been due to any act, default, or negligence on the part of the Contractor. All materials shall be carefully examined by the Contractor for defects, just before placing, and any found defective shall not be placed in the line.

END OF SECTION

SECTION 8

WATER HOUSE SERVICES AND APPURTENANCES

1. GENERAL

A. The Contractor shall furnish and install all corporation stops, house service pipe, meter assembly, covers, valves and appurtenances as indicated on the drawings, and specified herein. All underground service lines, valves and fittings shall conform to AWWA C800.

B. The Contractor shall provide all tools, equipment and accessories required for tapping all existing and new water mains and installing water services.

C. Detectable tape approved by the Engineer, shall be placed directly over all water services during backfilling operation so magnetic detection of service lines may be utilized in future by the Owner. Detectable tape shall be as specified in Section 7, paragraph 14.B.

D. Detectable tracer wire approved by the Engineer, shall be placed directly below all water services during backfilling operation so detection of service lines may be utilized in future by the Owner if detectable tape fails. Tracer wire shall be as specified in Section 7, Paragraph 14.C.

2. HOUSE SERVICES

A. Standard Water service lines shall be PE4710 polyethylene pipe (PEP), 1.5 inch, SDR-7 iron pipe size unless otherwise shown on the plans. Service lines shall conform to AWWA C901 and ASTM D-2737. For houses with sprinkler systems, refer to Part 3 – Commercial Service. Pipe shall be as manufactured by JM Eagle or approved equal.

B. Corporation stops shall be 1.5 inch, Mueller #E-25009 or equal. The Contractor shall furnish and install insert stiffeners wherever a compression connection is used on plastic service lines. Stainless steel inserts shall be Mueller #529116, 505142, or equal.

C. Cutting tools shall be of the hollow, shell bit type for removal of pipe plug. For tapping PVC mains use only Mueller Plastic Cutting Tool. On multiple taps, space corporation stops as recommended by pipe manufacturer. Furnish saddles with standard AWWA corporation stop inlet thread, double strapped for tapping 6-inch PVC and smaller. Saddles shall be Romac stainless steel Style 306 or equal.

D. Curb stops, when required, shall be A.Y. McDonald Model 7610-33 or equal. Valve boxes shall be Bingham and Taylor Model 92D curb box or equal.

E. Prefabricated meter box assemblies shall be installed in locations shown on the drawings. Prefabricated meter box assembly-riser to be Mueller 330RD2430FDBS000454N for 2-1” meters, includes 2-1” angle lockwing ball valves, with 2-1” angle dual check valves, 1” x 18” brass risers with 1.5” MNPT inlet and 2-1” outlets. Inlet to have Mueller #E-15451 and outlet to have Mueller 1” MNPT adapters to connect to SDR-7 PEP IPS service lines. Meter box lids shall be as specified in paragraph F. No meter installation shall be placed in a traffic area or driveway unless otherwise approved by Engineer or Owner.

F. Meter boxes shall be PVC 24” I.D. with minimum wall thickness of 0.2”. Meter box frame and covers shall be Vestal cast iron frame Model ER-1824 with plastic solid lid Model RMRC-20 with Kamstrup Antenna Counter bore underlid. For meters set in traffic areas Contractor shall furnish and install extra heavy lids. Lids shall have the word "Water" cast into the cover and include lifter worm locks. Contractor shall verify fit and compatibility of assembly components prior to ordering. Contractor shall supply meter box lid wrenches as required by the Owner.

G. Single meter pit assemblies shall be as shown on Sheet W-2.00. Dual meter pit assemblies shall be shown on Sheet W-3.00. Unless otherwise directed by the Town or Engineer, Sheet W-3.00 shall be used for all new connections.

3. COMMERCIAL SERVICE

A. Service lines of sizes 1.5 inch and 2 inch shall be PE4710 Polyethylene SDR-7 PEP IPS, AWWA C-901, unless otherwise directed by the Engineer or Owner. Pipe shall be as manufactured by JM Eagle or approved equal.

B. Corporation stops shall be A.Y. McDonald Model 74701B33 or equal.

C. For tapping ductile iron pipe or PVC pipe, use Romac Style 306 stainless steel service saddle with 1.5 or 2 inch iron pipe threads. Use Teflon tape for threaded service connections. Do not torque saddles or sleeves without water pressure in main.

D. Curb stops, when required, shall be A.Y. McDonald Model 7610-33 or equal. Valve boxes shall be Bingham and Taylor Model 142R curb box or equal.

E. Meter pits and setters shall be as detailed on Detail Sheets W-4.00 and W-4.10. Prefabricated meter box assemblies shall be A.Y. McDonald #780 series riser style setters with angle ball valve with angle dual check valve with low bypass. Bypass to have ball valve. Setter to have female iron pipe threads. Use A.Y. McDonald # 7475333 male adapters to connect to service pipe.

F. Meter boxes are to be PVC, sizes 30” x 30” for 1-1/2 inch water meters and 36” x 30” for 2 inch water meters. PVC meter boxes are Bingham and Taylor Model PMP30 for 1-1/2 inch meters and PMP36 for 2 inch meters. Use Vestal Expanda ring Part #

32-048 for 1-1/2 inch meter pits and Part # 32-049 for 2 inch meter pits. Use 20 inch monitor frame for both 1-1/2 inch and 2 inch meter pits Part # 32-056 with Trumbull PVC meter lid 20 inch Model 36-5610 with bracket and Kamstrup Antenna Counter bore under lid. Lids shall be marked “Water”.

4. WATER METERS

A. All water meters shall be by the same manufacturer. All meters shall be lead free and comply with AWWA standards and certified to NSF 61/ANSI 61 standards.

B. Meters shall have a totalizing register with 10,000,000 gallon capacity. All meters shall register in U.S. Gallons.

C. Residential meters ends shall be external straight pipe thread. Commercial and industrial meter ends shall be two-bolt oval, AWWA 125 lb. class flanges. The Contractor shall check all connecting fitting for compatibility prior to ordering.

D. Residential meters up to and including 1 inch shall be Kamstrup Model 2100, Ultrasonic Radio Read AMR and commercial/industrial meters shall be Kamstrup Model 3101 Ultrasonic Radio Read AMR..

5. BLOWOFF HYDRANT

A. Blow-off hydrants shall be required at all dead-end lines which extend past the last customer service and do not have a fire hydrant past the last customer service.

B. Hydrant shall be 2-inch Model #78 as manufactured by Kupferle Foundry Company, or equal.

C. Pit for buried installation shall be 24-inch as detailed on Sheet W-7.00. Pit shall be Bingham and Taylor Model MMP24 or equal. Furnish a traffic frame and cover as referenced in Part 2.F with words "Blow Off" cast in lid.

D. Blow-offs and associated drainage lines shall not be connected to any type of sewer or submerged in any stream or installed in any manner that would permit back siphonage into the Town’s water distribution system.

END OF SECTION

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SECTION 9

STORM DRAINS AND APPURTENANCES

1. GENERAL

A. The Contractor shall furnish all material for and shall construct the pipelines and all required appurtenances at the locations and to the lines, slopes and elevations shown on the drawings or designated by the Engineer.

B. Storm drains and storm drain leads shall be corrugated metal pipe except where shown on the contract drawings or directed by the Owner or Engineer to be reinforced concrete pipe. The type, size and class of pipe shall be in accordance with the requirements specified herein and as shown on the drawings.

C. The Contractor shall submit certifications to the Engineer that all pipe, fittings, and joints are as specified herein.

2. CORRUGATED METAL PIPE

A. Corrugated metal drainage pipe shall be metal-steel culvert pipe, aluminized steel (Type 2) pipe, or corrugated aluminum pipe as shown on the Contract Drawings, dictated by field conditions, and/or directed by the Engineer. All metal-steel culvert pipe shall be minimum 14 gauge, bituminous coated, and shall meet applicable requirements of AASHTO Specification M-36 and M-190. Aluminized steel pipe shall be minimum 16-gauge, Type 2, helical corrugated or spiral rib pipe conforming to AASHTO M-36. Corrugated aluminum pipe shall be minimum 16-gauge, helical corrugated pipe conforming to AASHTO M-196 and M-197.

B. Field joints shall be made with band couplers of the same alloy used in the pipe. Band couplers shall be 16 gauge, 7 inches wide, two-piece coupler and fastened with aluminized or galvanized steel bolts. Band coupling shall also conform to AASHTO M-36.

3. REINFORCED CONCRETE PIPE

A. Pipe shall be Reinforced Concrete Pipe, Class IV, meeting AASHTO Specification M-170 with tongue and groove joints. Finished End Sections shall be reinforced to conform with Class IV pipe and shall meet SHA Standards.

B. All reinforced concrete pipe furnished under this contract shall have joints composed of concrete fitted with rubber gaskets as specified in Section 18 of ASTI Designation C-361 or other elastomeric gasketing approved by the Engineer.

C. The rubber gasket shall be the sole element depended upon to make the joint watertight under all conditions, including movement due to expansion, contraction, and normal settlement. Joints shall be made up according to the manufacturer's recommendations.

4. HDPE PIPE

A. Storm drain shall be ADS N-12 WT dual wall pipe per ASTM F2648 for pipe and fittings or approved equal. Joints shall meet ASTM 3212 and ASTM C969.

B. In non-paved areas, minimum cover shall be 24 inches and in paved areas, minimum cover shall be 12 inches measured to the bottom of the bituminous concrete.

5. PIPE INSTALLATION

A. Pipe and fittings shall be carefully handled and lowered into the trench. Special care shall be taken to ensure that each length shall abut against the next in such manner that there shall be no shoulder or unevenness of any kind along the inside of the pipe.

B. Before pipe is placed, the bottom of the trench shall be carefully shaped to fit the lower part of the pipe exterior with reasonable closeness for a width of a least 60% of the pipe width as indicated on the plans. Bell holes shall be dug sufficiently large to insure the making of proper joints and so that after placement, only the barrel of the pipe receives bearing pressure from the trench bottom. No pipe shall be brought into position until the preceding length has been thoroughly bedded and secured in place. Any defects due to settlement shall be made good by the Contractor without additional compensation therefor.

C. Proper and suitable tools and appliances for the safe and convenient handling and laying of pipe shall be used.

D. Whenever a pipe requires cutting to fit into the line or to bring it to the required location, the work shall be done in a satisfactory manner so as to leave a smooth end.

E. The pipes shall be thoroughly cleaned before they are laid and shall be kept clean until the acceptance of the completed work. The open ends of all pipelines shall be provided with a stopper carefully fitted so as to keep dirt and other substances from entering. This stopper shall be kept in the end of the pipeline at all times when laying is not in actual progress.

F. All concrete required to support and reinforce wye branches, bends and other fittings shall be placed as directed.

G. Backfill materials shall be hand placed and mechanically tamped in six-inch

layers, placed uniformly on both sides of the pipe, to a point at least one foot above the pipe crown. Each layer shall be thoroughly compacted for the full trench width and under, around and over the pipe. Mechanical tampers shall exert a pressure of not less than 250-foot pounds per square foot of area of tamping face.

H. For refill of the remaining trench depth, refer to Section "Excavation and Backfill".

6. LAYING PIPE IN FREEZING WEATHER

A. No pipe shall be laid upon a foundation into which frost has penetrated, nor at any time when the Engineer shall deem that there is danger of the formation of ice or the penetration of frost at the bottom of the excavation unless all required precautions as to the minimum length of open trench and promptness of backfilling are observed.

7. ARTIFICIAL FOUNDATION

A. Whenever directed, the Contractor shall lay pipe upon an artificial foundation which he shall construct. Such foundation may consist of gravel or concrete; all to be of the form and dimensions and placed in the manner required by the Engineer. All artificial foundations shall be of a character equal to that as hereinbefore specified.

8. DEFECTS TO BE MADE GOOD

A. If, at any time before the expiration of the guarantee period under this contract, any broken pipe, or any other defects are found in any of the lines or in any of the appurtenances the Contractor shall cause the same to be removed and replaced by proper material and workmanship, without extra compensation for the labor and material required, even though such injury or damage may not have been due to any act, default, or negligence on the part of the Contractor. All materials shall be carefully examined be the Contractor for defects prior to installation, and any found defective shall be rejected for use.

END OF SECTION

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SECTION 10

STORM DRAIN MANHOLES AND CATCH BASINS

1. GENERAL

A. The Contractor shall construct manholes and catch basins of reinforced concrete risers and base sections as detailed on Sheets SD-1.00 thru SD-2.10.

B. Manholes and catch basins shall be built at such points on the pipelines and of such form and dimensions as are shown on the Drawings or as may be directed by the Owner or Engineer. Manholes and catch basins shall be built as pipe laying progresses and the Owner or Engineer may stop work entirely on laying pipe if manhole construction is delayed to such an extent as to be hazardous to construction or the public.

C. Precast reinforced concrete risers, eccentric cones (use of slab tops subject to Engineer's approval) and bases shall be as detailed on Sheet SD-1.00 and SD-1.10 and in conformance with ASTM Designation C 478. Manhole joints between sections shall be fitted with D-LOK ring rubber gasket, meeting the requirements of ASTM Designation C 443. Installation shall be in accordance with manufacturer's recommendations.

D. Precast reinforced concrete base and riser sections shall be as manufactured by Atlantic Concrete Products Company, Gillespie Precast Inc, or equal.

E. Lifting holes in the walls of precast reinforced concrete risers will be allowed but shall be plugged with rubber stoppers and grouted flush with face of manhole wall after installation of manhole riser sections. Not more than two holes shall be cast in the walls of each riser section for the purpose of handling.

2. CATCH BASINS AND JUNCTION BOXES

A. Catch basins and junction boxes to be constructed in accordance with applicable sections of MDOT SHA Section 350 – Miscellaneous Structures and as shown on Detail Sheets SD-2.00 and SD-2.10. Catch basins and junction boxes shall be of reinforced concrete construction.

B. Catch basins and junction boxes shall be built at such points on the pipe lines and of such form and dimensions as are shown on the drawings or as may be directed. All flow channels shall be formed of brick or concrete in the bottom of catch basins and shall slope smoothly and evenly from the pipes entering the catch basin to the outlet pipe.

C. All concrete catch basins and junction boxes shall be waterproofed with two (2) coats of Seaboard LN-12 Asphalt Gilsonite paint or approved equal.

D. Mortar cement shall be in accordance with the "Standard Specification for Portland Cement" ASTM Designation C150 for Type II.

E. Precast reinforced concrete catch basins and junction boxes shall be as manufactured by Atlantic Concrete Products Company, Gillespie Precast Inc. or approved equal.

F. Catch basin steps or metal ladder rungs shall be in accordance with MDOT SHA Standard Detail 383.91 and 383.92.

3. POURED-IN-PLACE CONCRETE:

A. All concrete for manhole and catch basin slabs shall have a minimum compressive strength of 4,000 psi at 28 days.

4. MANHOLE STEPS

A. Manhole steps shall be made of 1/2 inch diameter steel reinforcing rod, ASTM Designation A 615, Grade 60, encased in polypropylene plastic. Manhole steps shall have notched tread ridge with retainer lug on each side.

B. Manhole steps shall be cast in place during manufacture of precast reinforced concrete sections. Embedment length shall be suitable for minimum 5 inch thick, precast reinforced concrete riser walls.

C. Manhole steps shall be spaced 12 inches apart. The maximum spacing from top of manhole to the first step shall not exceed 16 inches.

D. Manhole steps shall be OSHA approved and Model PS1 as manufactured by M.A. Industries, Inc., Peachtree City, Georgia, or equal.

5. MANHOLE FRAMES AND COVERS

A. Frames and covers for manholes shall be set by the Contractor as the work progresses. The frame shall be well bedded in mortar.

B. Material for frames and covers shall be in accordance with the standard specifications for gray iron castings ASTM Designation A 48 for Class No. 30 and as detailed on Sheet SS-3.10.

C. Frames shall be East Jordan Iron Works 154514 and covers shall be EJIW 154523 or Neenah R-1565 frame and cover or approved equal. "Storm Drain" shall be cast on the cover.

6. CATCH BASIN FRAMES AND GRATES:

A. Frames and grates for catch basins shall be set by the Contractor as work progresses.

B. Material for frames and grates shall be in accordance with the standard specifications for gray iron castings ASTM A 48 for Class No. 30.

C. Frames and grates shall conform to the MDOT SHA Standard Details 374.12 and 374.13 for “NR” Inlet and 374.02 and 374.03 for “WR” inlet, as shown on Detail Sheets SD-2.00 and SD-2.10. Frames and grates shall be of the size and type detailed on the drawings.

7. FLOW CHANNELS

A. All manhole flow channels and benches shall be Pre Cast Concrete with care taken to secure smooth and even surfaces. Channel sections shall be built up to true line and radius, and curved sections shall provide a uniform transition in the flow direction.

B. Materials and construction of flow channels shall be in accordance with appropriate sections for materials so used, as hereinafter specified.

8. BRICK

A. Brick work shall be limited to flow channel and bench construction and frame adjustment courses. No other brick shall be used in manhole construction.

B. All brick shall conform to the "Standard Specifications for Sewer Brick", ASTM Designation C 32, Grade SS, except that the maximum absorption for the average of five bricks shall not exceed 10 percent; and the individual brick maximum shall not exceed 14 percent.

9. MORTAR:

A. Cement shall be in accordance with the "Standard Specifications for Portland Cement," ASTM Designation C 150 for Type II.

B. Sand shall be composed of sharp, angular, silicious grains, coarse, or graded from fine to coarse with the coarsest grains predominating, and sensibly free from clay, loam, dirt, mica, organic matter, or other impurities. Sand containing more than 5

percent by weight of foreign material shall not be used. This limit may be changed for special classes or work if hereinafter specified. Sand exhibiting more than an acceptable amount of fine matter or impurities may be required to be washed after delivery on the work or shall be rejected altogether. Sand for mortar shall be screened to reject all particles of a greater diameter than 1/4-inch and shall not contain more than 5 percent by weight of a very fine material.

C. Unless hereinafter specified otherwise, all mortar shall be composed of cement and sand of the character above specified. The proportion by volume shall be one part of cement to two of sand. One volume of cement shall be 94 pounds net. One volume of sand shall be 0.9 cubic feet, the sand not being packed more closely than by throwing it into a box in the usual way. Mortar shall be fresh mixed in small batches for the work in hand. Tight boxes or platforms made for the purposes shall be used. The sand and cement shall be thoroughly mixed dry, in the proper proportions, until a uniform color has been produced, whereupon a moderate dose of water shall be added, so as to produce a stiff paste of the proper consistency.

D. Sand obtained from the excavation shall not be used.

10. LAYING BRICK:

A. All brick work shall be laid by competent mechanics, and any workmen not deemed to be such by the Engineer shall be removed from the work at once.

B. All brick shall be laid in a full bed of mortar with all vertical and horizontal joints filed solid with mortar.

C. Joints shall be not less than 3/8-inch or more than 1/2-inch wide except as otherwise specified in (e) below.

D. No brickwork shall be laid when the temperature is below 40 degrees or when the indications are for lower temperatures within 24 hours. The Contractor shall take such measures as may be approved to prevent brickwork from being exposed to freezing temperatures for a period of not less than five days after laying.

E. Special care shall be taken in laying brick in inverts of manholes to insure a uniform flow of water through the sections. In such locations, joints shall not exceed 1/16-inch in thickness and each brick shall be laid in full mortar bed with joints on bottom side and end made in one operation. No grouting or working in of mortar after laying the brick will be permitted.

11. WATERPROOFING:

A. All concrete structures shall receive two (2) coats of Seaboard LN-12 Asphalt Gilsonite paint or approved equal.

12. TESTS:

A. If inspection reveals any visible leakage or seepage in any manhole, the Contractor will be required to accomplish such remedial measures as may be directed by the Engineer. Caulking or patching or interior manhole surfaces will not be acceptable.

13. CONNECTIONS TO EXISTING CATCH BASINS:

A. Connections to existing catch basins shall be made where indicated on the drawings.

B. The size of opening through the wall of existing catch basin for connection of new pipe shall not exceed the outside diameter of pipe plus six (6) inches. All connections shall be fully grouted.

C. Flow channels in existing catch basins shall be reconstructed as necessary to provide smooth transition of flow from new connection.

END OF SECTION

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SECTION 11

CONCRETE CURB, GUTTER, AND SIDEWALK

1. GENERAL

A. Contractor shall provide all material and appurtenances required to construct curb gutter and sidewalk to the lines and grades shown on the drawings or designated by the Engineer.

B. Concrete curb, gutter and sidewalk shall be as detailed herein and as shown on applicable Town of Denton Detail Sheets PW-2.00 through PW-6.10.

C. Contractor shall submit a mix design for concrete, including a complete list of materials including admixtures and the applicable reference specifications and copies of test reports showing that the mix has been successfully used to produce concrete with the properties specified.

D. Contractor shall submit one copy of the delivery ticket for each load of ready-mixed concrete, showing all information required by ASTM C 94.

E. Contractor shall also submit manufacturers' recommendations for the expansion joint material to be utilized. Clearly mark data to indicate which type, size or item is proposed. Data shall be sufficient to show conformance to specified requirements.

F. Concrete shall not be delivered until forms, reinforcement and embedded items are in place and ready for concrete to be placed.

G. Store reinforcement in a manner that will avoid excessive rusting or coating with grease, oil, dirt, and other objectionable materials.

H. Sidewalk shall be 4-inches thick except at driveway entrances where thickness shall be 8-inches, or 6-inches with #10 wire mesh.

I. Sidewalk ramps for the handicapped shall be as shown on applicable Town of Denton Detail Sheets PW-6.00 through PW-6.10.

2. CONCRETE

A. Contractor Furnished Mix Design: Design concrete mix in accordance with ACI 211.1. Slump shall be between 2 inches and 3 inches. The concrete shall have a 28-day compressive strength of 3000 pounds per square inch unless noted otherwise. The concrete shall contain no less than 6-1/2 bags of Portland Cement per cubic yard of concrete.

B. Air-Entrained Concrete: Provide for all concrete exposed to the weather. Compressive strength 3000 pounds at 28 days. Accomplish air-entrainment by using an air-entraining admixture, not air-entraining cement. If the entrained air content falls below the specified limit, add a sufficient quantity of admixture to bring the entrained air content within the specified limits. Dissolve the admixture in a portion of the mixing water and add to the mix in the drum in a manner that will ensure uniform distribution of the agent throughout the batch. The concrete shall have air entrainment of not less than 4 percent nor more than 6 percent and shall be so certified by the supplier.

3. MATERIALS

A. Cement: Type I Portland cement conforming to ASTM C 150, Type I.

B. Water: Water, including free moisture and water in the aggregates, shall be fresh, clean, and potable.

C. Aggregates: ASTM C 33, size no. 57 except as modified herein. Obtain all aggregates for exposed concrete surfaces from one source. Aggregates shall be free from any substance which may be deleteriously reactive with the alkalies in the cement. One-inch maximum aggregate size unless indicated otherwise.

D. Admixtures:

1. Air-entraining: Air entraining admixtures for concrete shall be in accordance with ASTM C 260, for all air-entrained concrete.
2. Accelerating: ASTM D 98, Type I or Type II. Use only when approved.

E. Materials for Forms: Forms shall be constructed of steel. Surfaces of forms shall be free from irregularities, dents, and sags. Other forms may be used in special circumstances with written authorization by the Engineer.

F. Welded Wire Fabric: ASTM A 185, 6" by 6" - #10 gauge (6" X 6" - W1.4 X W1.4) unless otherwise indicated.

G. Materials for Curing Concrete:

1. Impervious Sheeting: Waterproof paper, polyethylene sheeting, or polyethylene coated burlap conforming to ASTM C 171.
2. Liquid Membrane-Forming Compound: White pigmented compound, Type 2, free of paraffin or petroleum conforming to ASTM C 309.
3. Liquid Chemical Compound: A suitable sealer-hardener designed for sealing and hardening in addition to curing of the concrete, applied by the method and at the rate recommended by the manufacturer. It shall not

reduce the adhesion of paint or other material to be applied to the concrete. The chemical compound shall be free of petroleum resins or waxes.

H. Preformed Expansion Joint Filler: Preformed expansion joint filler, non-extruding and resilient bituminous types, in accordance with ASTM D 1751.

I. Vapor Retarder Material: Polyethylene sheeting, 6-mil nominal thickness.

4. FORM WORK DESIGN REQUIREMENTS

A. General: Provide forms for all concrete. Set forms true to line and grade and maintain so as to ensure completed work within the allowable tolerances specified, and make mortar-tight. Place forms so that they can be removed without damaging the concrete.

B. Coating: Before placing the concrete, coat the contact surfaces of forms with a non-staining mineral oil, non-staining form coating compound, or two coats of nitro-cellulose lacquer.

C. Tolerances and Variations: Set and maintain concrete forms to ensure that after removal of the forms no portion of the concrete work will exceed any of the tolerances specified in ACI 347.

D. All curb, gutter and sidewalk shall be in accordance with details as shown on applicable Town of Denton details.

5. PLACING REINFORCEMENT AND MISCELLANEOUS MATERIALS:

A. Provide all wire fabric as indicated or specified, together with all necessary wire ties, supports and other devices necessary to install and secure the reinforcement properly. All reinforcement, when placed, shall be free from rust, scale, oil, grease, clay and other coating and foreign substances that could reduce or destroy the bond. Rusting of reinforcement shall not be a basis of rejection, provided that the rusting has not reduced the effective cross sectional area of the reinforcement, and provided that loose rust shall be removed prior to placing.

B. Placing: Place reinforcement accurately and secure in place. On the ground, use concrete or other non-corrodible material for supporting reinforcement.

C. Splicing: Conform to ACI 318, except as otherwise indicated or specified. Where splices in addition to those indicated are necessary, they shall be approved prior to their use. Do not make splices at points of maximum stress. Make splices in welded wire fabric so that the overlap is not less than the spacing of the cross wires.

D. Setting Miscellaneous Material: Place and secure anchors and bolts, pipe sleeves, conduits, and other such items in position before the concrete is placed. Plumb anchor bolts, check for location and elevation and secure rigidly in position. Fill voids in sleeves temporarily with rapidly removable material to prevent the entry of concrete into the voids.

E. Expansion Joints: Make joints 1/2-inch wide except as indicated otherwise. Fill expansion joints flush with surface, with preformed joint material. Do not extend reinforcement or other embedded metal items bonded to the concrete through any expansion joint.

6. MEASURING, MIXING, TRANSPORTING AND PLACING CONCRETE

In accordance with ACI 301, Chapters 7 & 8, except as modified herein.

A. Measuring: Make moisture, volumetric and air determinations at intervals specified herein under testing requirements. Allowable tolerances for measuring cement and water shall be 1 percent; for aggregates, 2 percent; and for admixtures, 3 percent.

B. Mixing: Machine mix all concrete. Begin mixing within 30 minutes after cement has been added to the aggregates. Introduce all mixing water in the drum before one-fourth of the mixing time has elapsed. The time elapsing between the introduction of the mixing water to the cement and aggregates or the cement to the aggregates and the start of placing of the concrete in final position in the forms shall not exceed 60 minutes if the air temperature is less than 85 degrees Fahrenheit, and 45 minutes if the air temperature is equal or greater than 85 degrees F. On arrival at the job site, no addition of water will be allowed other than that required initially to adjust to the specified slump. Such an addition must not exceed the limits of the specified maximum water-cement ratio.

C. Conveying: Convey concrete from the mixer to the forms as rapidly as practicable and so as not to cause segregation or loss of ingredients. Deposit concrete as close as practicable to its final position in the forms. At any point in the conveying, the free vertical drop of the concrete shall not exceed 3 feet. Clean conveying equipment thoroughly before each run. Do not use aluminum pipe or chutes. Place concrete as soon as practical after the forms and the reinforcement has been inspected and approved. Remove any concrete which has segregated in conveying and dispose of as directed.

D. Placing: Do not place concrete when weather conditions prevent proper placement and consolidation. Do not place concrete in uncovered areas during periods of precipitation. Do not place concrete in water. Prepare subgrades of earth or other material properly and, if necessary, cover with heavy building paper or other suitable material to prevent the concrete from becoming contaminated. Dampen porous subgrades as required to prevent water of hydration from being absorbed into the

subgrade. Clean forms of dirt, construction debris, water, snow, and ice. Place concrete in one continuous operation except where construction joints are provided. Place concrete in areas bounded by construction joints in one continuous operation. Remove water which accumulates on the surface of the concrete during placing by absorption with porous materials in a manner that prevents removal of cement.

E. Vibration: Consolidate concrete by wood tampers, spading and settling with a heavy leveling straight edge.

F. Cold Weather: Except with authorization, do not place concrete when the ambient temperature is below 40 degrees F or when the concrete is likely to be subjected to freezing temperatures within 24 hours. Remove lumps of frozen material and ice from the aggregates before placing aggregates in the mixer.

G. Hot Weather: Cool ingredients before mixing so as to prevent rapid drying of newly placed concrete. When the ambient temperature is more than 90 degrees F, the temperature of the concrete as placed shall not exceed 90 degrees F; shade the fresh concrete as soon as possible after placing; and start curing as soon as the surface of the fresh concrete is sufficiently hard to permit curing without damage to the concrete.

7. SURFACE FINISHES

A. Finishing: The surfaces of the concrete shall be screeded by means of a template advanced with a combined longitudinal and crosswise motion, a slight surplus of concrete being maintained ahead of the template. After screeding, the concrete shall be floated longitudinally with a plank float, after which the surface shall be checked with a straight edge and corrected and refloated, as necessary. The sidewalk surface shall be scored and broom finished. Edges and joints shall be rounded with an edger having a radius of 1/4-inch.

8. CURING AND PROTECTION

A. General Requirements: Protect concrete adequately from injurious action by sun, rain, frost, mechanical injury, and oil stains, and do not allow it to dry out from the time it is placed until the expiration of the minimum curing periods specified herein. Use impervious-sheeting curing, liquid chemical, or liquid membrane-forming compound, except as specified otherwise herein. Do not use membrane-forming compound on surfaces where its appearance would be objectionable, or where coverings are to be bonded to the concrete. Begin curing immediately following the removal of forms. Maintain the temperature of the air next to the concrete at no less than 40 degrees F for the full curing periods.

B. Impervious-Sheeting Curing: Wet the entire exposed surface thoroughly with a fine spray of water and then cover with impervious sheeting. Lay sheets directly on the concrete surface and overlap 12 inches. Make sheeting not less than 18 inches wider

than the concrete surface to be cured, and weight down on the edges and over the transverse laps to form closed joints. Repair or replace sheets if torn or otherwise damaged during curing. The sheeting shall remain on the concrete surface to be cured for not less than seven (7) days.

C. Liquid Membrane-Forming Compound Curing: Seal or cover all joint openings prior to application of the curing compound to prevent the curing compound from entering the joint. Compound shall remain on the concrete for seven (7) days before sealer or covering is removed and joint sealing material is placed in the joint.

D. Application: Apply the compound immediately after the surface loses its water sheen and has a dull appearance. Agitate curing compound thoroughly by mechanical means during use and apply uniformly in a two-coat continuous operation by suitable power-spraying equipment. The total coverage for the two coats shall be between 150 and 200 square feet per gallon of undiluted compound. The compound shall form a uniform, continuous, coherent film that will not check, crack, or peel and shall be free from pinholes or other imperfections. Apply an additional coat of the compound immediately to areas where the film is defective. Respray concrete surfaces that are subject to heavy rainfall within 3 hours after the curing compound has been applied in the same manner.

E. Protection of Treated Surfaces: Keep concrete surfaces to which liquid membrane-forming compounds have been applied free from foot and vehicular traffic and other sources of abrasion for not less than 72 hours. Maintain continuity of the coating for the entire curing period and repair damage to the coating during this period immediately.

F. Liquid Chemical Compound Curing: Provide for surfaces for which a sealer-hardener finish is specified, and, at the Contractor's option, provide in lieu of liquid membrane-forming compound curing for other surfaces. The application of the compound shall conform to the requirements for liquid membrane-forming compound curing except as specified otherwise herein. The coverage and number of applications shall be in accordance with the recommendations of the manufacturer of the compound.

G. Curing Periods: Cure not less than ten (10) days for concrete exposed to the weather and not less than seven (7) days for all other concrete.

H. Removal of Forms: Remove forms in a manner which will prevent damage to the concrete. Do not remove forms without approval, nor sooner than 24 hours after placement of concrete.

END OF SECTION

SECTION 12

PREPARATION OF ROADWAY BASE

1. GENERAL

A. The Contractor shall perform all excavation, embankment, grading and compaction necessary to prepare for and construct streets, curb and gutter, sidewalk, driveways, seeded areas and miscellaneous work items associated therewith.

2. EXCAVATION

A. Excavate where necessary and stockpile material at a nearby site.

B. All organic matter, roots, etc. removed from within limits of construction shall be removed and disposed of. Stockpile topsoil for reuse in final grading, as applicable.

C. Material from excavation conforming to specifications for road base, embankment, or which can be processed to so conform, shall be re-used for base, embankment or refill below subgrade. The Contractor shall secure, and pay for, tests to verify suitability of material for reuse.

D. Material unsuitable for reuse, or not needed, shall be disposed of by the Contractor at an approved off-site location or as directed by the Owner.

E. The Contractor shall separate suitable from unsuitable material prior to stockpiling or removal.

F. The Engineers opinion regarding suitability of excavated material for use in preparation of subgrade shall be final . In general, organic material, refuse, large lumps or stones having any dimensions greater than 2 inch, paving material, frozen earth or materials which will not readily consolidated or compact in the trench will be considered unsuitable.

3. EXCAVATION AND REFILL BELOW SUBGRADE

A. Whenever the character of the material at the bottom of an excavation is such, in the opinion of the Engineer, as to require excavation to an additional depth of adequate foundation, such additional depth shall be excavated by the Contractor to the extent directed by the Engineer.

B. As directed, the Contractor shall use suitable material from excavation, special backfill, gravel or a combination thereof in refilling excavations below subgrade.

C. Gravel bedding shall be in accordance with MDOT SHA Section 901.01 for No. 57 gravel bedding.

D. Special backfill shall be in accordance with MDOT SHA Section 916.01.

4. EMBANKMENT

A. Construct where necessary, from suitable excavated or borrow material. Embankment to reach top of subgrade elevations necessary for construction of new work.

B. All material to be placed in embankment shall meet the requirements of MDOT SHA Section 916.

5. ROAD BASE - AGGREGATE BASE COURSE

A. Aggregate base course shall be constructed where shown and as detailed on the drawings. Base course shall be in conformance with MDOT SHA Section 901.01 for graded aggregate base. Base course shall be to the thickness, lines and grade shown on the Contract Drawings, and shall meet the minimum requirements shown on Detail Sheets PW-1.00 through PW-1.40.

B. Existing pavement removed under this contract may be recycled and reused for aggregate base course if properly processed to conform with gradation requirements of MDOT SHA Section 901.01 for graded aggregate base. The Contractor shall secure, and pay for, tests to verify suitability of material for reuse.

6. COMPACTION

A. Base shall be thoroughly compacted to a minimum of 95 percent of maximum dry density as determined by AASHTO T-180, Method A. In place density tests shall be conducted in accordance with AASHTO T-191 Method A to verify degree of compaction. Number and locations of Proctor and density tests shall be as determined by the Engineer.

B. Owner will select, employ and pay for services of an Independent testing agency to perform specified inspection, sampling and testing. All testing shall be coordinated and arranged by the Owner or Engineer. The testing agency shall submit a copy of all testing reports directly to the Engineer. Each report shall contain the project identification name and number, name of Contractor, name of testing agency, and location of sample tested, as a minimum.

C. For those tests which indicate compaction densities less than specified, the Contractor shall secure, at his own expense, the specified compaction using methods approved by the Engineer. Contractor shall reimburse the Owner for all costs associated with re-tests due to inadequate compaction.

END OF SECTION

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SECTION 13

BITUMINOUS CONCRETE PAVEMENT
AND
BITUMINOUS SURFACE TREATMENT

1. GENERAL

A. The Contractor shall place and construct bituminous concrete pavement consisting of base course and/or surface course as shown on Detail Sheets SS-1.00 and PW-1.00 thru PW-1.40 and as specified herein. All bituminous concrete base course shall be placed on the properly prepared, compacted and graded base or existing pavement as indicated on the Contract Drawings, and as specified in Section 12.

B. In areas where new curb and gutter are to be constructed, they shall be constructed prior to the placing of bituminous concrete.

C. Special care shall be taken to cover and protect curbs and gutters which are to remain exposed from the application of bituminous materials. The Contractor shall be responsible for the restoration to a like-new appearance of any new curb and gutter discolored by the Contractor's operations.

D. Manholes, catch basins, inlets, frames and covers, valve boxes and all other surface utilities shall be adequately covered and protected prior to the application of bituminous materials. Such materials shall not be allowed to enter any storm drainage or sewerage system and suitable containment provisions shall be employed to prevent surface runoff of bituminous materials.

2. GRADED AGGREGATE BASE COURSE

A. Aggregate base course shall be in conformance with the requirements of Section 12, Paragraph 5.

3. TACK COAT

A. Existing bituminous concrete and concrete surfaces designated for resurfacing shall be tack coated prior to the application of bituminous material.

B. Tack coat shall be residual asphalt uniformly spread at a rate of 0.01 to 0.05 gallons per square yard of surface area.

C. Tack coat shall be applied on a clean and dry surface.

4. BITUMINOUS CONCRETE PAVEMENT

A. Hot mix, hot laid bituminous concrete pavement for streets shall be furnished and placed to the lines and grades shown on the drawings and shall be in conformance with the materials and construction requirements of the MDOT SHA Section 504. Bituminous concrete shall not be placed when the temperature of the surface upon which the bituminous concrete is to be placed is below 60 F (16 C) for plant mixed seal; 40 F (4C) for courses having nominal depths of less than 1/1/2 inch. (40 mm); or 32 F (0 C) for any other course. The temperature of the mixture shall not be less than 225 F (107 C) at the time of placement. Protect curb and gutter during placement of bituminous concrete pavement.

B. The pavement shall be placed in two layers, and shall meet or exceed the minimum thickness requirement shown on Detail Sheets SS-1.00 and PW-1.00 thru PW-1.40.

C. Contractor shall submit one copy of the loading ticket for each load of bituminous concrete delivered. This ticket shall certify that the asphaltic concrete plant has not produced any other mix during the period of time during which mix for this project is being produced.

5. BITUMINOUS SURFACE TREATMENT

A. Where existing bituminous surface treated payment is disturbed, bituminous surface treatment restoration shall consist of an initial prime coat and triple bituminous surface treatment within the limits of pavement resurfacing as shown on the plans.

B. Prior to the application, all existing paved surfaces shall be properly prepared, including filling and grading of all holes and depressions and surface removal of all waves, bumps and corrugations. The full roadway width shall then be swept for removal of dust, debris and loose or foreign materials and a prime coat applied to all newly prepared surfaces.

C. Bituminous surface treatment shall be in conformance with materials and construction requirements of the MDOT SHA Section 904.

END OF SECTION

SECTION 14

MISCELLANEOUS

1. GENERAL

A. Refer to the Town of Denton website for additional ordinances on land use (www.dentonmaryland.com).

2. STREET SIGNS

A. At every intersection, a street sign or street signs shall be placed having thereon the names of the intersecting streets. At intersections where streets cross, there shall be at lest two (2) such street signs and at the intersections where one (1) street ends or joins with another street, there shall be at least one (1) such street sign. Street signs shall be as detailed on Sheet PW-8.00.

3. DECORATIVE LIGHTING

A. Decorative lighting shall be as detailed on Sheet G-2.00. The following is a set of lighting standards and specifications generated for the Town of Denton and are in accordance with the 10th edition of the Illuminating Engineering Society of North America Lighting Handbook.

1. Roadway Classifications:

    a. Expressway: A divided major roadway for through traffic with partial control of access and generally with interchanges at major crossroads.

    b. Major: The part of the roadway system that serves as the principal network for through traffic flow. The routes connect areas of principal traffic generation and important rural highways entering the city.

    c. Collector: The roadways serving traffic between major and local roadways. These are roadways used mainly for traffic movements within residential, commercial, and industrial areas.

    d. Local: Roadways used primarily for direct access to residential, commercial, and industrial, or other abutting property. They do not include roadways carrying through traffic. Long local roadways are generally divided into short sections by a system of collector roadway systems.

2. Area Classifications:

   a. Commercial: A business area of a municipality where ordinarily there are many pedestrians during night hours. This definition applies to densely developed business areas outside, as well as within, the central part of a municipality. The area contains land use that frequently attracts a heavy volume of nighttime vehicular and pedestrian traffic.

   b. Intermediate: Those areas of a municipality characterized by frequent moderately heavy nighttime pedestrian activity, as in blocks having libraries, community recreation centers, large apartment buildings, industrial buildings, or neighborhood retail stores.

   c. Residential: A residential development, or a mixture of residential and small commercial establishments, characterized by few pedestrians at night. This definition includes area with single family homes, town houses, and small apartment buildings.

3. Road Surface Classifications:

   a. Class R1: Portland Cement, concrete road surface. Asphalt road surface with a minimum of 15 percent of the aggregates composed of artificial brightener and aggregates.

   b. Class R2: Asphalt road surface with an aggregate composed of a minimum 60 percent gravel (size greater than 10 mm). Asphalt road surface with 10 to 15 percent artificial brightener in aggregate mix. (Not normally used in North America).

   c. Class R3: Asphalt road surface (regular and carpet seal) with dark aggregates (e.g., trap rock, blast furnace slag); rough texture after some months of use (typical highways).

   d. Class R4: Asphalt road surface with very smooth texture.

4. Roadway Illuminance Selections:

   a. Select the Average Maintained Illuminance Value from the table below for the Road, Area and Surface Classification identified above.

Roadway Average Maintained Illuminance Values (Eavg.) in footcandles (fc)					
Road Classification	**Area Classification**	**Pavement Classification**			**Illuminance Uniformity Ratio Eavg. to Emin.**
		R1	**R2 and R3**	**R4**	
Expressway	Commercial	1.0	1.4	1.3	3 to 1
	Intermediate	0.8	1.2	1.0	
	Residential	0.6	0.9	0.8	
Major	Commercial	1.2	1.7	1.5	3 to 1
	Intermediate	0.9	1.3	1.1	
	Residential	0.6	0.9	0.8	
Collector	Commercial	0.8	1.2	1.0	4 to 1
	Intermediate	0.6	0.9	0.8	
	Residential	0.4	0.6	0.5	
Local	Commercial	0.6	0.9	0.8	6 to 1
	Intermediate	0.5	0.7	0.6	
	Residential	0.3	0.4	0.4	

Note: When preparing Average Maintained Illuminance Calculations, use a Light Loss Factor (LLF) of 0.72(min.).

5. Walkway Illuminance Selection:

   a. Select the Maintained Illuminance Value from the table below for the specific type of Way Classification.

Pedestrian Way Average Maintained Illuminance Values (Eavg) in footcandles (fc)			
Way Classification*		**Minimum Average Horizontal Levels**	**Average Vertical Levels for Special Pedestrian Security (6' above walkway)**
Sidewalks (roadside)	Commercial	1.0	2.2
	Intermediate	0.6	1.1
	Residential	0.2	0.5
Walkways distant from roadways		0.5	0.5

* Crosswalk traversing roadways in the middle of long blocks and at street intersections should be provided with additional illumination.

Note: When preparing Average Maintained Illuminance Calculations, use a Light Loss Factor (LLF) of 0.72(min.).

6. Parking Lot Illuminance Selection

   a. Select the Maintained Illuminance Value from the table below for the specific type of Parking Lot Classification.

Maintained Illuminance for Parking Lots in footcandles (fc)		
	Basic	**Enhanced Security**
Minimum Horizontal Illuminance	0.2	0.5
Uniformity Ratio (Maximum to Minimum)	20:1	15:1
Minimum Vertical Illuminance	0.1	0.25

Note: When preparing Average Maintained Illuminance Calculations, use a Light Loss Factor (LLF) of 0.72(min.).

7. Lighting Design Submission Requirements

   a. Provide computer assisted lighting calculations for approval of each area of interest.

   b. Provide a summary chart along with the calculations.

Example:

Summary of Lighting Calculations				
Description of Area	**Average Maintained Footcandles**	**Min.(fc)**	**Max.(fc)**	**Illuminance Uniformity Ratio $E_{avg.}$ to $E_{min.}$**
Main Street	1.2	0.2	6.0	6.0

   c. Provide detailed shop drawings of the fixture with all options clearly identified for the town's review and approval.

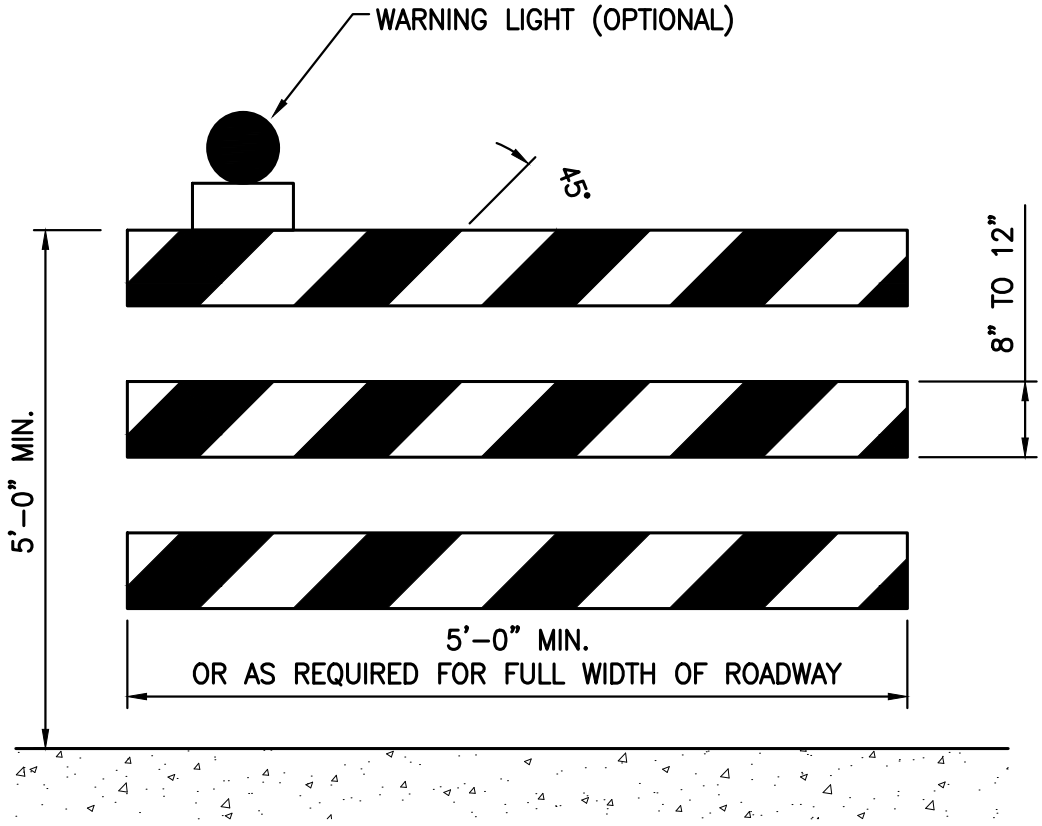
   d. Calculation Workplane shall be taken at grade level.

   e. Calculation Grid shall be 10' x 10' for the entire area of interest.

   f. Use cutoff luminaries and avoid ones that emit light above the horizontal plane. In residential areas, minimize direct light onto nearby windows and illumination onto adjacent properties. Use internal house-side-shields, etc. wherever necessary.

   g. Coordinate with the town for provision of spare parts.

END OF SECTION



NOTES:

1. TYPE 3 BARRICADE SHALL COMPLY WITH THE MDOT SHA MANUAL OF TRAFFIC CONTROL DEVICES (MUTCD) LATEST EDITION.
2. BARRICADES MAY BE USED TO MARK ANY OF THE FOLLOWING CONDITIONS:
   A. A ROADWAY ENDS
   B. THE RAMP OR LANE CLOSED FOR OPERATIONAL PURPOSES, OR
   C. THE PERMANENT OR SEMI-PERMANENT CLOSURE OR TERMINATION OF A ROADWAY.
3. WHEN USED TO WARN AND ALERT ROAD USERS OF THE TERMINUS OF A ROADWAY IN OTHER THAN TEMPORARY TRAFFIC CONTROL ZONES, BARRICADES SHALL MEET THE DESIGN CRITERIA OF MUTCD SECTION 6F.68 EXCEPT THAT THE COLOR OF THE STRIPS SHALL BE RETROREFLECTIVE WHITE AND RETROREFLECTIVE RED.
4. RAIL STRIPE WIDTHS SHALL BE 6 INCHES, EXCEPT THAT 4 INCHES WIDE STRIPES MAY BE USED IF RAIL LENGTHS ARE LESS THEN 36 INCHES. THE SIDES OF BARRICADES FACING TRAFFIC SHALL HAVE RETROREFLECTIVE RAIL FACES.
5. APPROPRIATE ADVANCE WARNING SIGNS SHOULD BE USED.

TOWN OF DENTON DEPARTMENT OF PUBLIC WORKS		GENERAL DETAILS BARRICADE	REVISED DEC 2007 APR 2021	SHEET G-1.00

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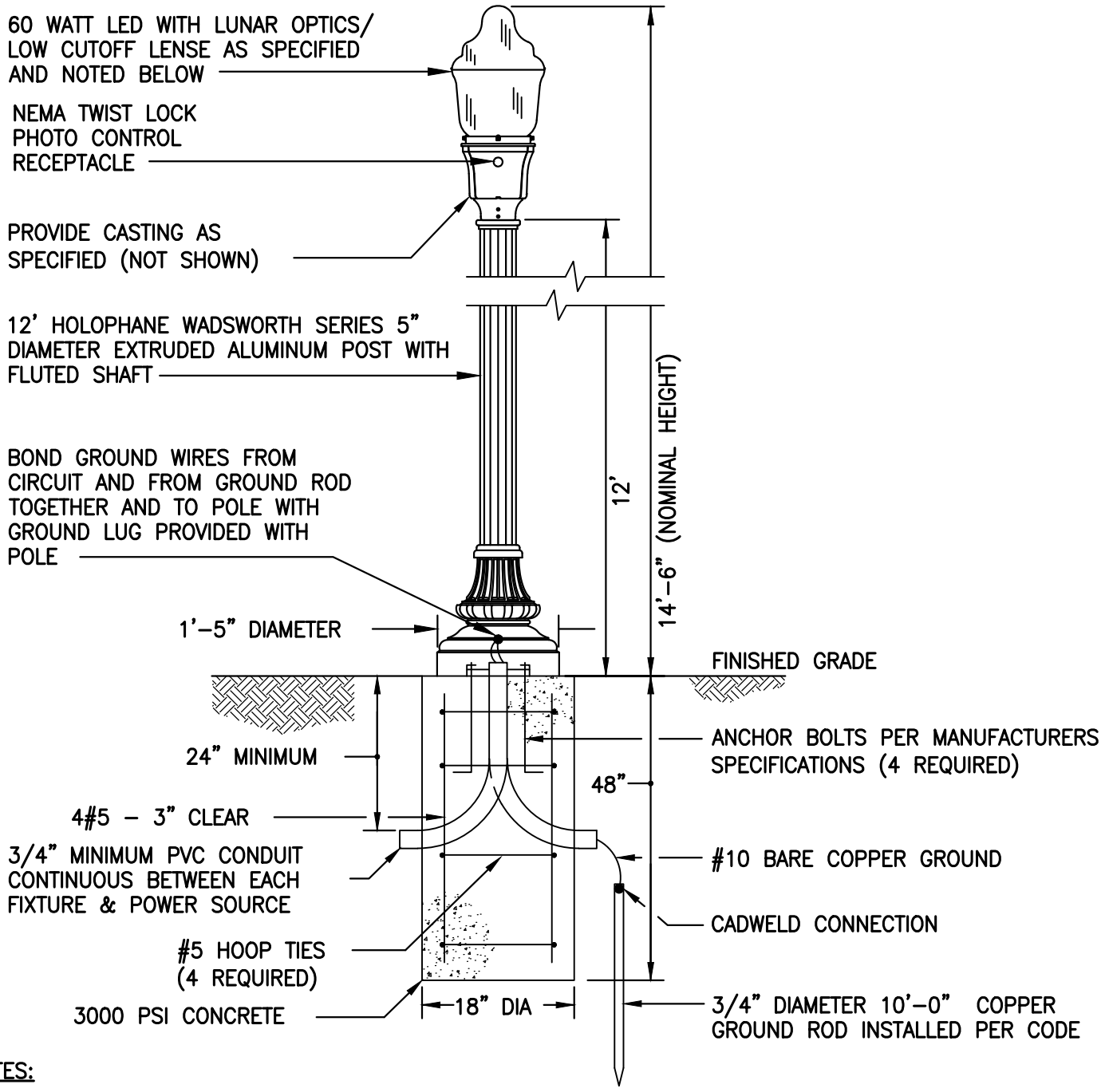

NOTES:

1. DECORATIVE LUMINAIRE SHALL BE HOLOPHANE "GRANVILLE" SERIES.
2. POLE HEIGHT NOT TO EXCEED 12 FEET ABOVE GRADE.
3. FOUNDATION SHALL BE POURED ON UNDISTURBED SOIL. CONCRETE SHALL NOT BE POURED BELOW 40°F ON A FALLING TEMPERATURE.
4. LIGHT POLE ASSEMBLIES SHALL BE UNIFORMLY INSTALLED BETWEEN CURB & SIDEWALKS, OR AS DIRECTED BY ENGINEER.
5. ALL ELECTRIC INSTALLATIONS TO BE DONE BY A LICENSED ELECTRICIAN AND PER LATEST CODE REQUIREMENTS.
6. DISCONNECT SWITCH TYPE AND LOCATION PER TOWN OF DENTON APPROVAL

TOWN OF DENTON DEPARTMENT OF PUBLIC WORKS	GENERAL DETAILS DECORATIVE STREET LIGHT PEDESTRIAN SCALE HEIGHT	REVISED DEC 2007 APR 2021	SHEET G-2.00

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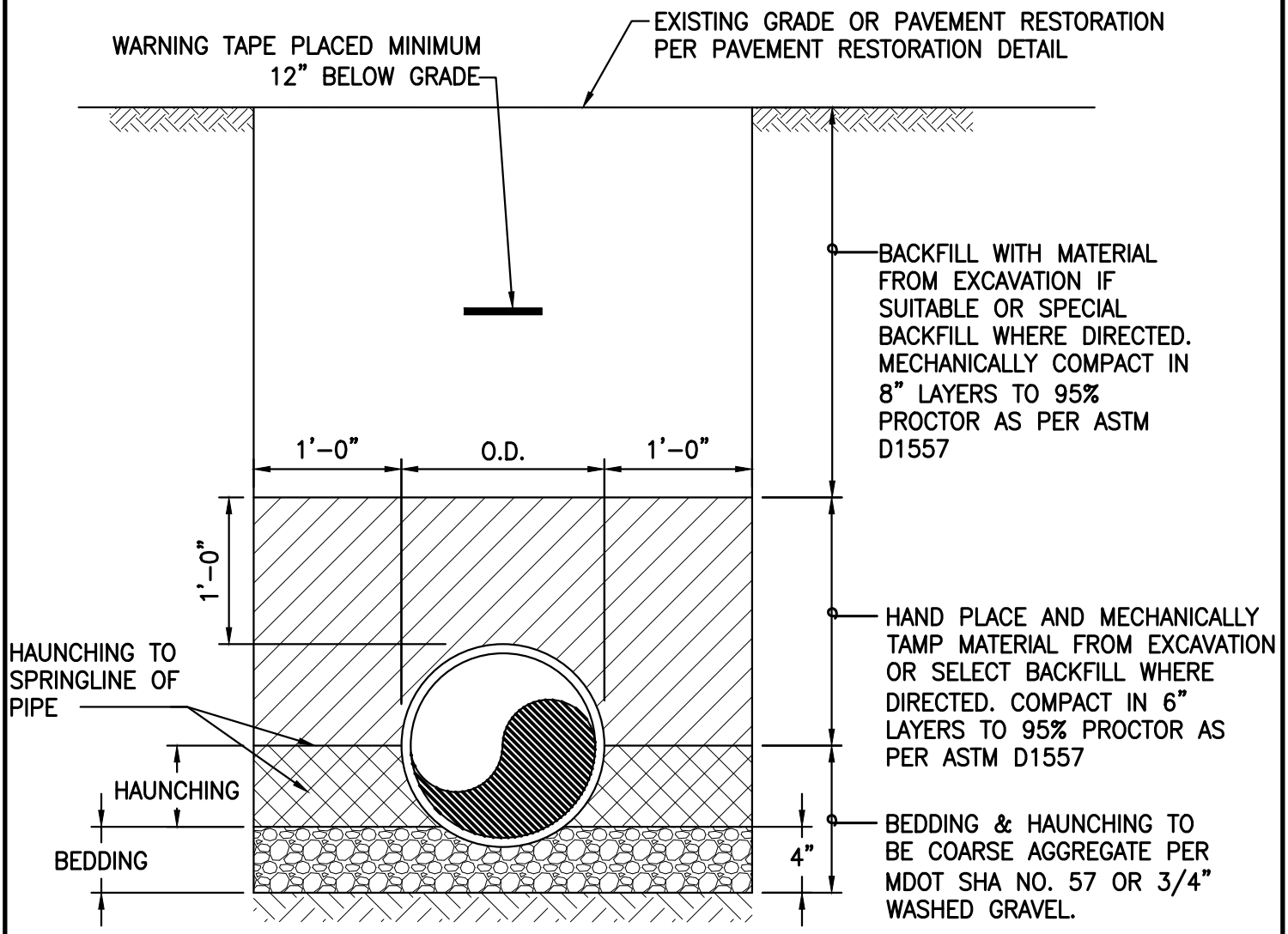
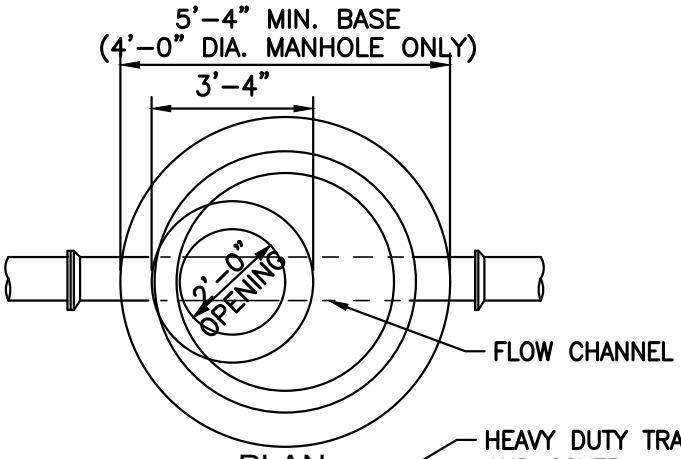


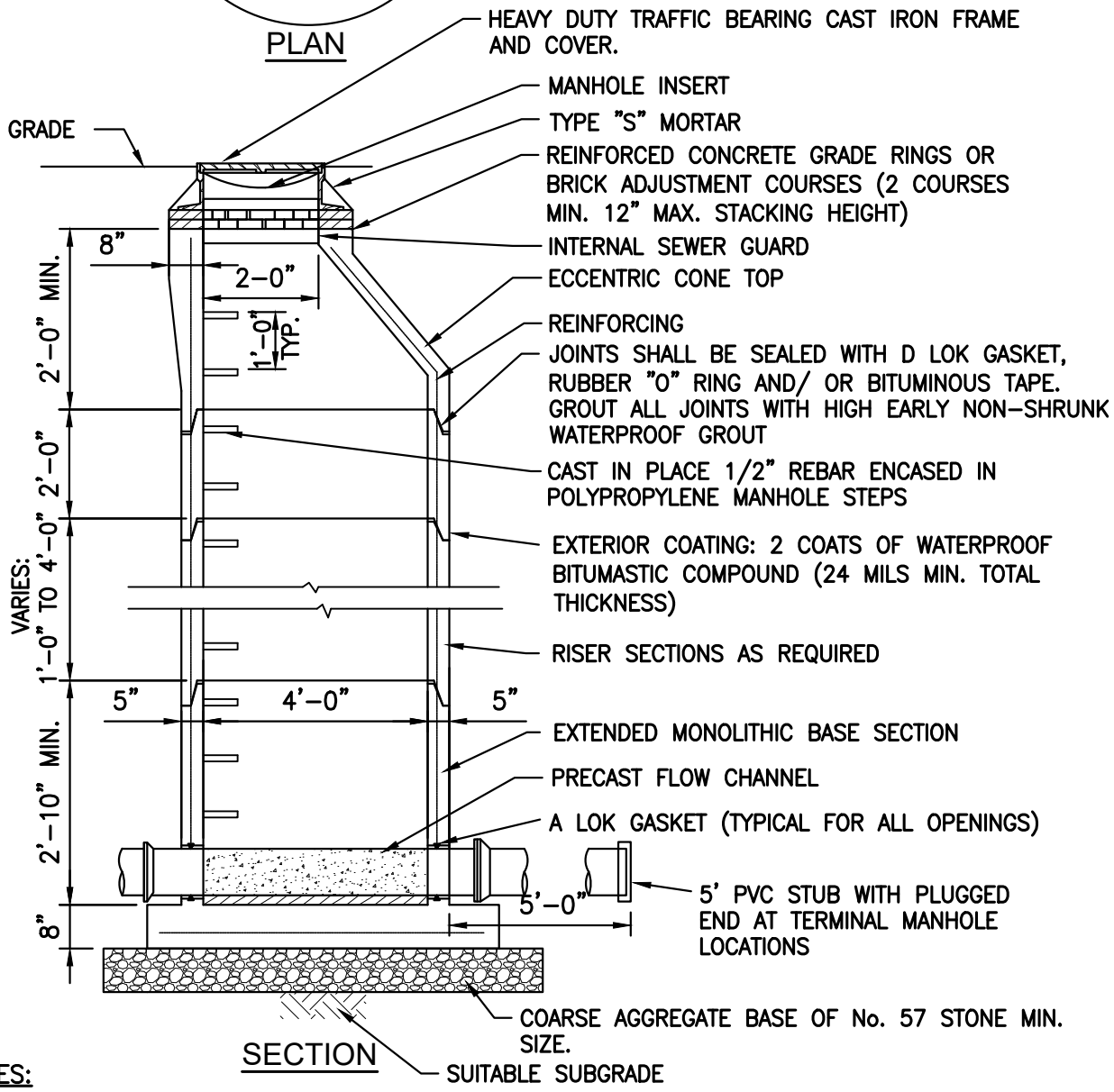
PIPE BEDDING AND BACKFILL DETAIL

TOWN OF DENTON DEPARTMENT OF PUBLIC WORKS	DENTON PUBLIC WORKS	SANITARY SEWER DETAILS PIPE BEDDING & BACKFILL	REVISED DEC 2007 APR 2021	SHEET SS-1.00

G:\Projects\2020\200110 Town of Denton On-Call Services 2020-2025\Standards & Specs\Revised 2021 (GMB)\Manual\DETAILS\CAD\SANITARY SEWER.dwg May 04, 2021 - 3:22pm



PLAN



SECTION

NOTES:

1. MANHOLE SHALL CONFORM TO ASTM C-478, LATEST REVISION.
2. PARGE ALL JOINTS WITH TYPE "S" NON-SHRINK GROUT.

TOWN OF DENTON DEPARTMENT OF PUBLIC WORKS		SANITARY SEWER DETAILS PRECAST CONCRETE MANHOLE	REVISED DEC 2007 APR 2021	SHEET SS-2.00

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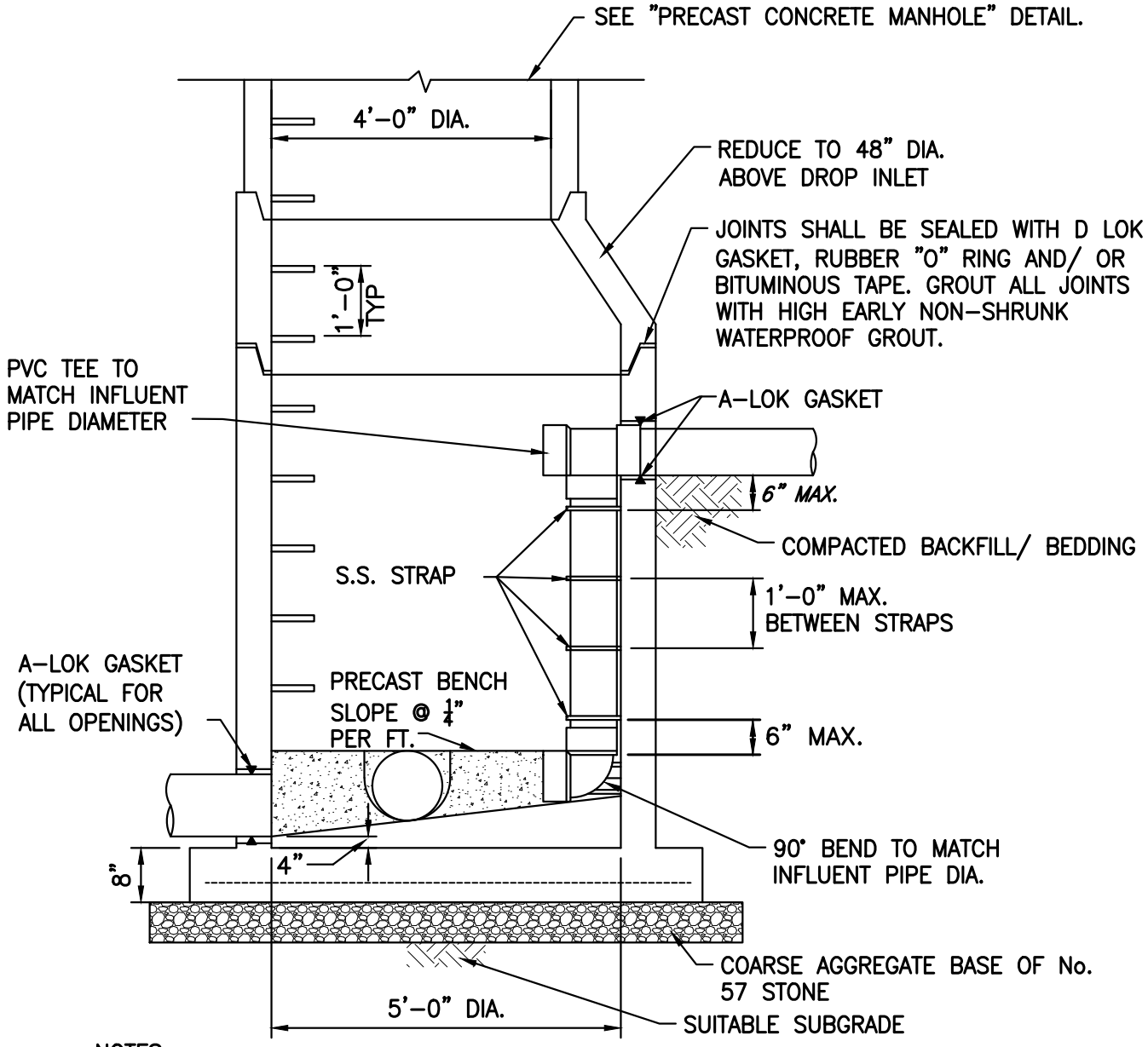
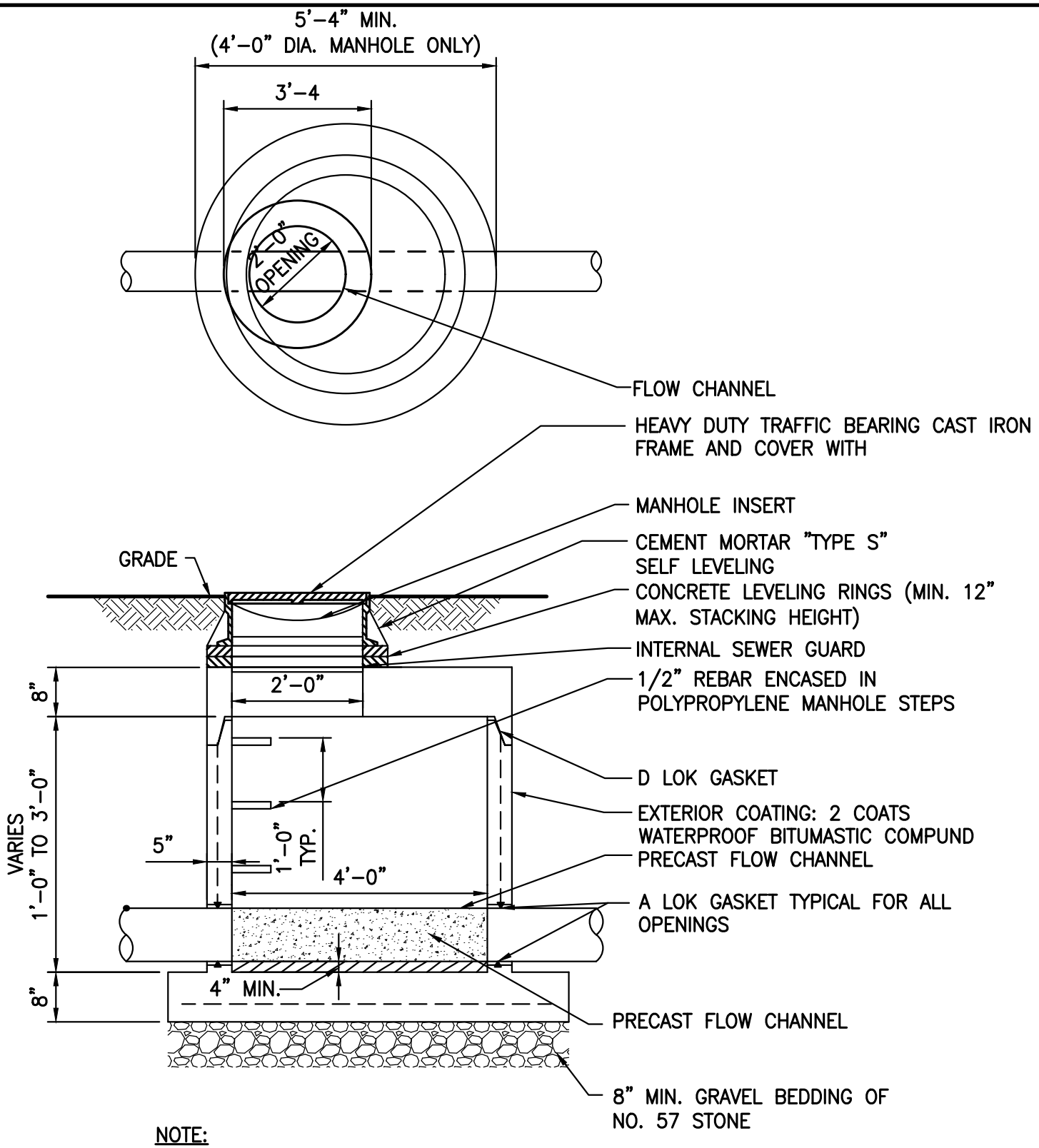


NOTES:

1. STAINLESS STEEL STRAPS SHALL BE ⅛"x1" MINIMUM.
2. S.S. STRAP CONNECTORS SHALL BE EXPANSION BOLTS OR APPROVED EQUAL.
3. PARGE ALL JOINTS WITH TYPE "S" NON-SHRINK GROUT

TOWN OF DENTON DEPARTMENT OF PUBLIC WORKS	DENTON PUBLIC WORKS	SANITARY SEWER DETAILS PRECAST CONCRETE INSIDE DROP MANHOLE	REVISED DEC 2007	SHEET SS-2.10

G:\Projects\2020\200110 Town of Denton On-Call Services 2020-2025\Standards & Specs\Revised 2021 (GMB)\Manual\DETAILS\CAD\SANITARY SEWER.dwg May 04, 2021 - 3:22pm



NOTE:

1. MANHOLE SHALL CONFORM TO ASTM C-478
2. DETAIL APPLIES TO SANITARY SEWER AND STORM WATER MANHOLES

TOWN OF DENTON DEPARTMENT OF PUBLIC WORKS	SANITARY SEWER DETAIL SHALLOW PRECAST MANHOLE	REVISED DEC 2007	SHEET SS-2.20

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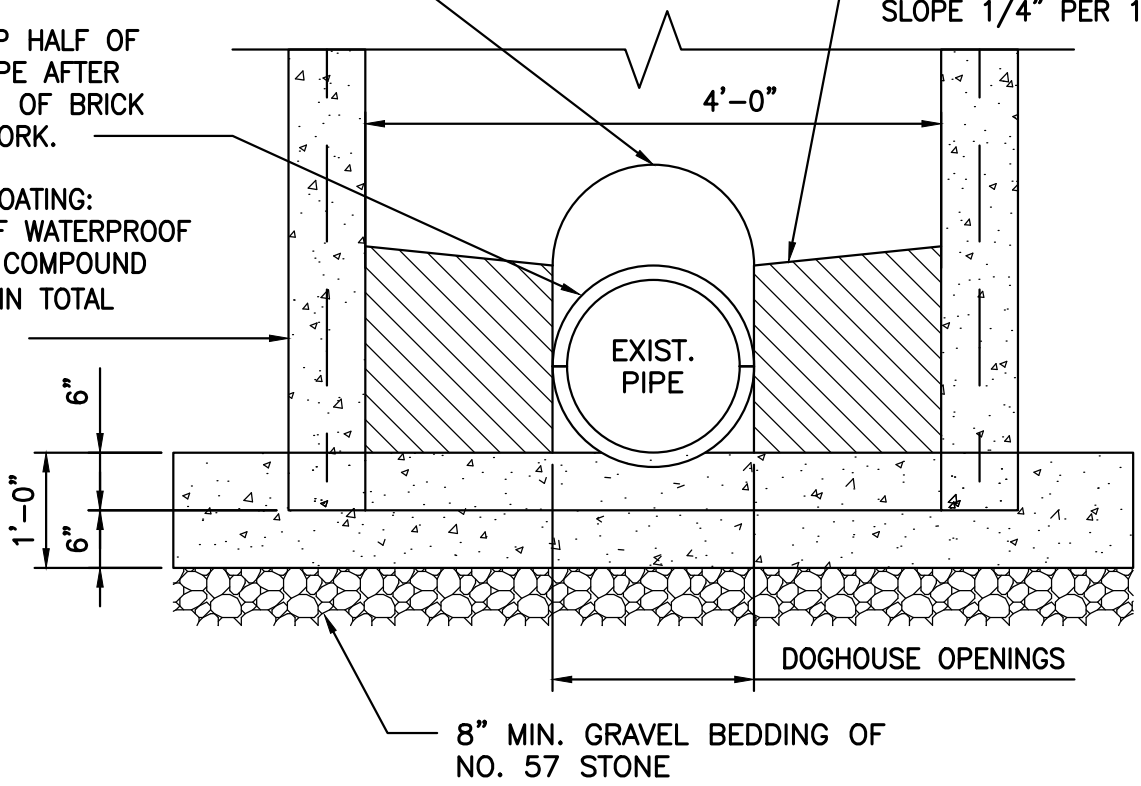
WALL AREA BETWEEN EXISTING PIPE AND DOGHOUSE OPENINGS SHALL BE FILLED WITH BRICK AND NON-SHRINK MORTAR.

REMOVE TOP HALF OF EXISTING PIPE AFTER COMPLETION OF BRICK CHANNEL WORK.

EXTERIOR COATING: 2 COATS OF WATERPROOF BITUMASTIC COMPOUND (24 MILS MIN TOTAL THICKNESS)

BRICK OR HAND FORMED CONCRETE FLOW CHANNELS SLOPE 1/4" PER 1FT



NOTE: MANHOLE SHALL CONFORM TO ASTM C-478, LATEST EDITION

DOGHOUSE MANHOLE

TOWN OF DENTON DEPARTMENT OF PUBLIC WORKS		SANITARY SEWER DETAILS ALTERNATE MANHOLE BASE (DOG HOUSE MANHOLE)	REVISED DEC 2007	SHEET SS-2.30

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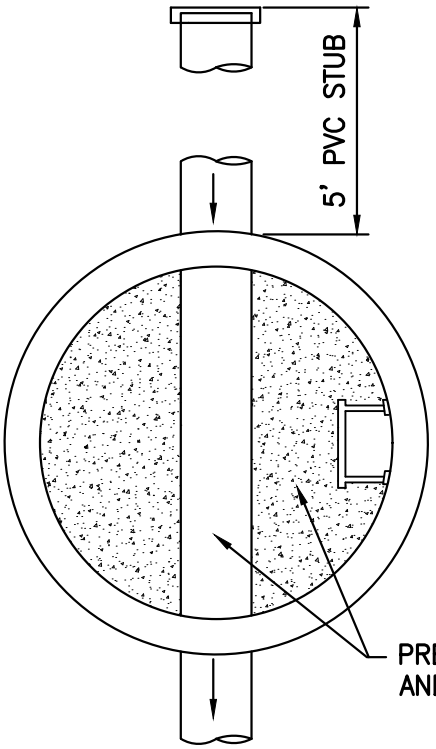
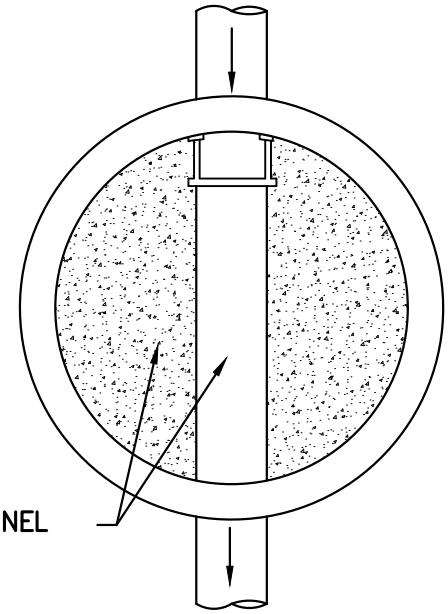
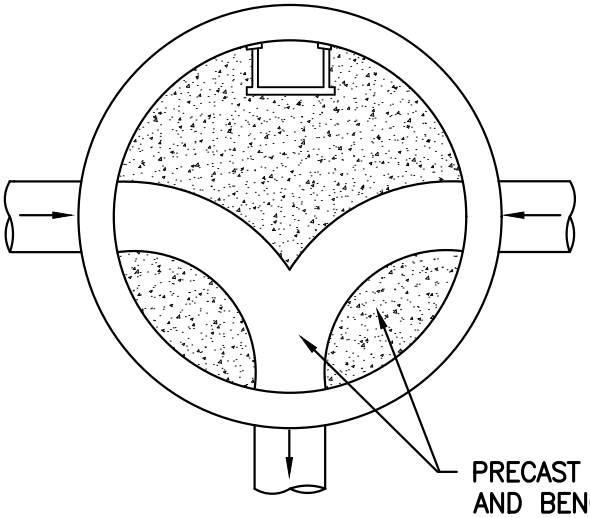


TERMINAL

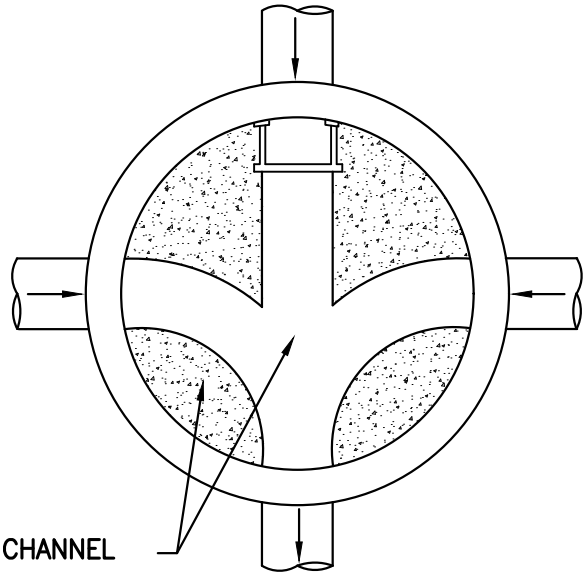


1-WAY

PRECAST FLOW CHANNEL AND BENCH



2-WAY



3-WAY

PRECAST FLOW CHANNEL AND BENCH

TOWN OF DENTON DEPARTMENT OF PUBLIC WORKS		SANITARY SEWER DETAILS MANHOLE FLOW CHANNEL	REVISED DEC 2007	SHEET SS-2.40

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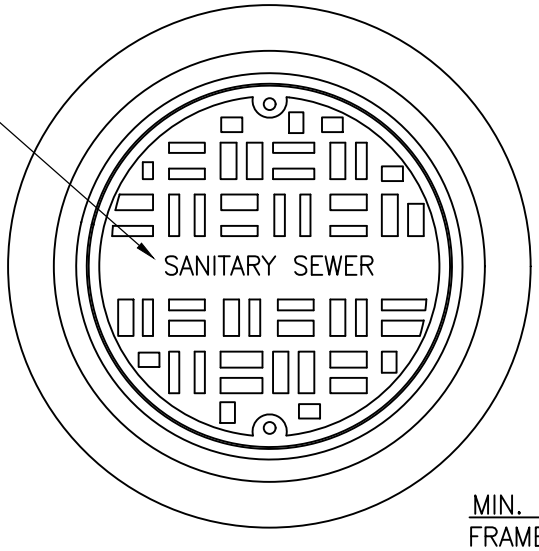
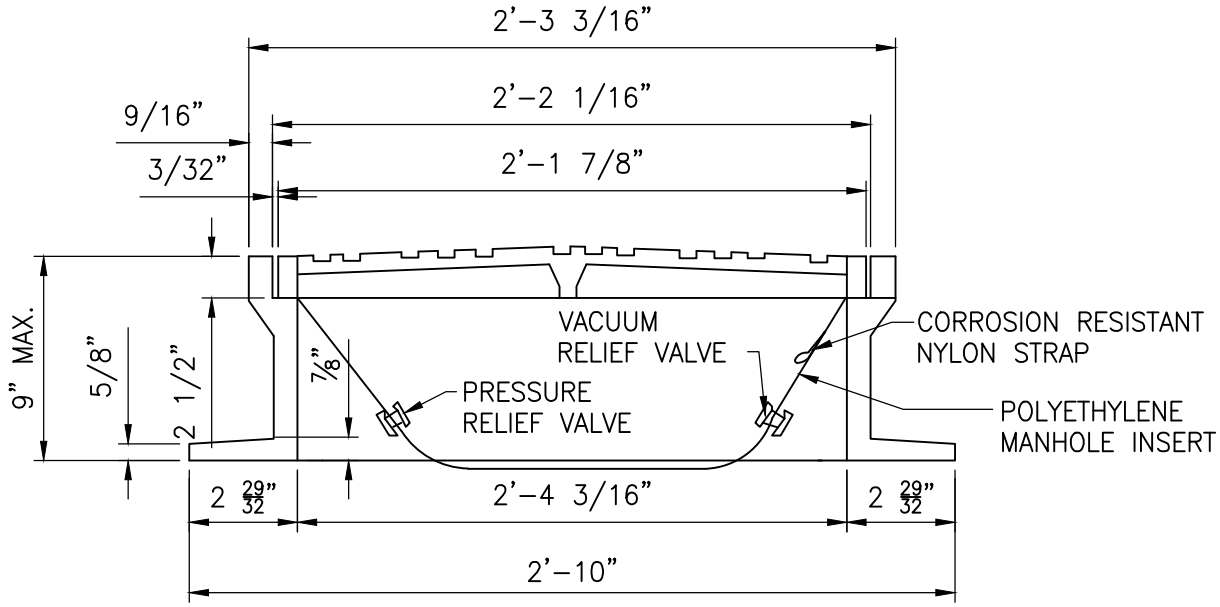


EAST JORDAN (SHOWN)
FRAME #154514
COVER #154524 (STORM DRAIN)
COVER #154523 (SANITARY SEWER)
NEENAH FOUNDRY
FRAME R-1565
COVER R-1564
OR APPROVED SUBSTITUTE

MIN. AVG. WEIGHT	
FRAME	250 LBS.
COVER	189 LBS.

(HEAVY DUTY, TRAFFIC BEARING)



NOTES:

1. CASTINGS SHALL CONFORM TO ASTM A-48, LATEST EDITION, CLASS 35B IRON MINIMUM.
2. PICK HOLES REQUIRED WITHIN COVER.
3. MANHOLE INSERT PARSON MODEL V2P AS MANUFACTURED BY PARSON ENVIRONMENTAL PRODUCTS OR APPROVED EQUAL. MANHOLE INSERT TO BE USED AT SANITARY SEWER MANHOLES ONLY.

TOWN OF DENTON DEPARTMENT OF PUBLIC WORKS		SANITARY SEWER DETAILS	REVISED	SHEET
		MANHOLE FRAME AND COVER	DEC. 2007 APR 2021	SS-2.50

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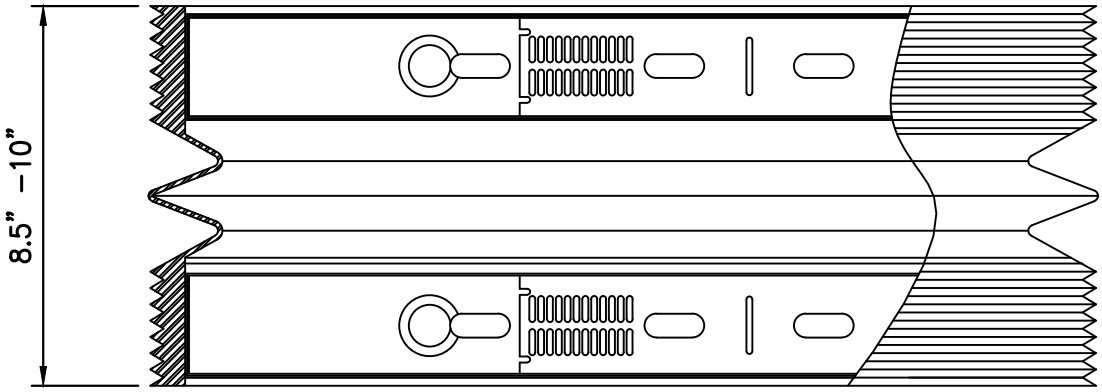
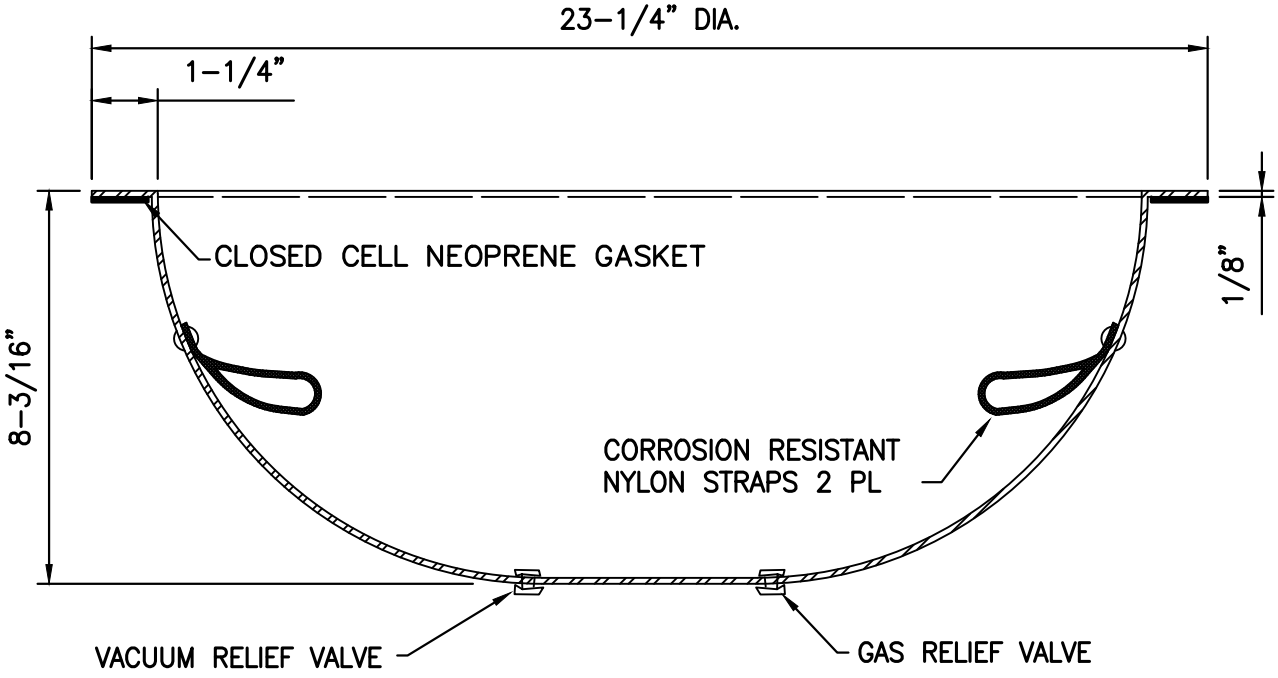


SEWER GUARD (INTERNAL)



MANHOLE INSERT

NOTES:

1. MANHOLE INSERT MODEL V2P AS MANUFACTURED BY PARSON ENVIRONMENTAL PRODUCTS, WERNERSVILLE, PA. 19606, OR AN APPROVED EQUAL.

2. INTERNAL SEWER GUARD MODEL FLEXIRIB SEAL AS MANUFACTURED BY PARSON. ENVIRONMENTAL PRODUCTS, WERNERSVILLE, PA 19606, OR AS APPROVED EQUAL.

3. MANHOLE INSERT AND SEWER GUARD SEAL TO BE USED IN ALL SANITARY SEWER MANHOLES TO ELIMINATE INFLOW AT MANHOLE FRAME – STRUCTURE INTERFACE.

TOWN OF DENTON DEPARTMENT OF PUBLIC WORKS	SANITARY SEWER DETAILS MANHOLE INSERT AND FRAME-CHIMNEY SEAL	REVISED DEC 2007 APR 2021	SHEET SS–2.60

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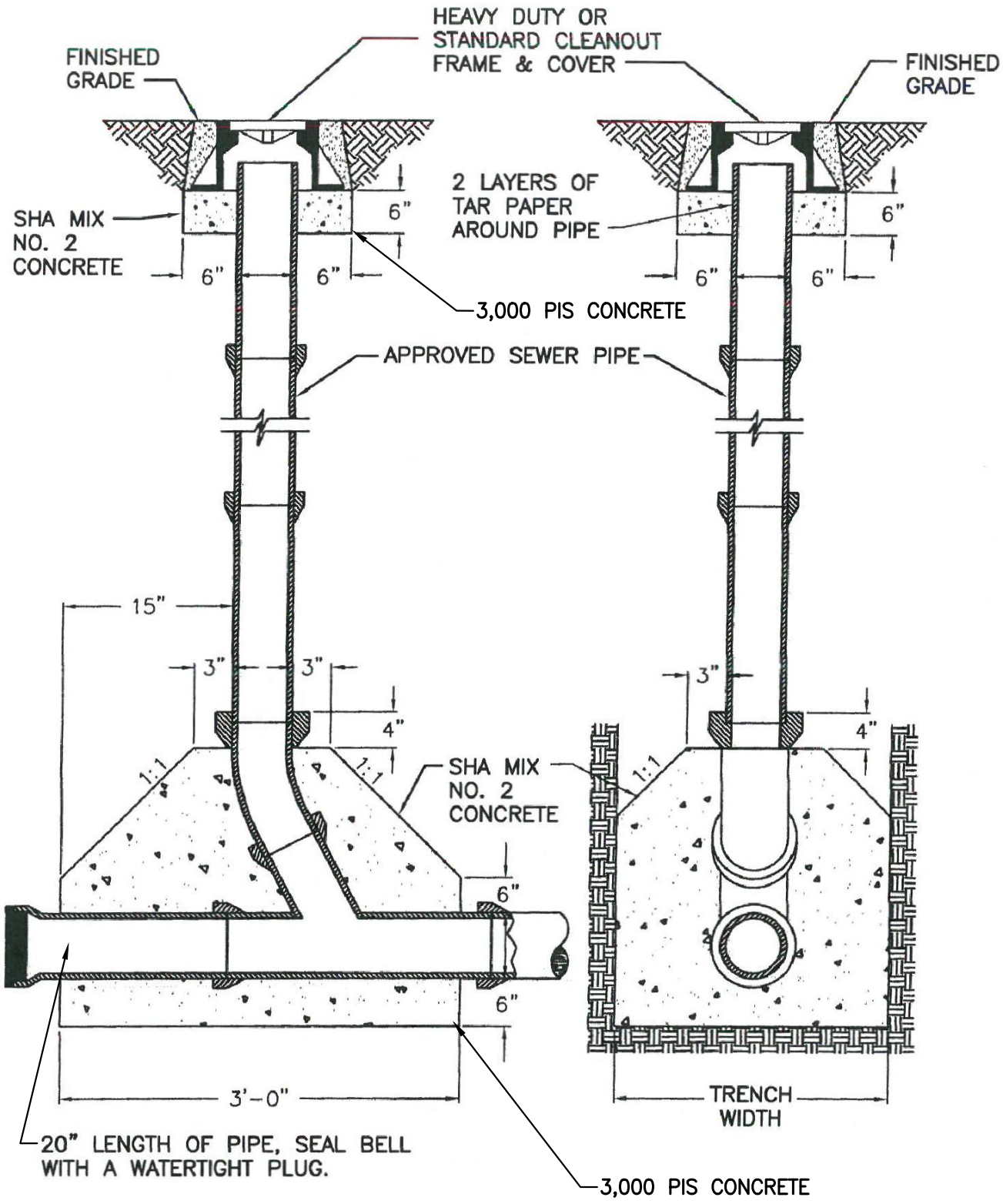
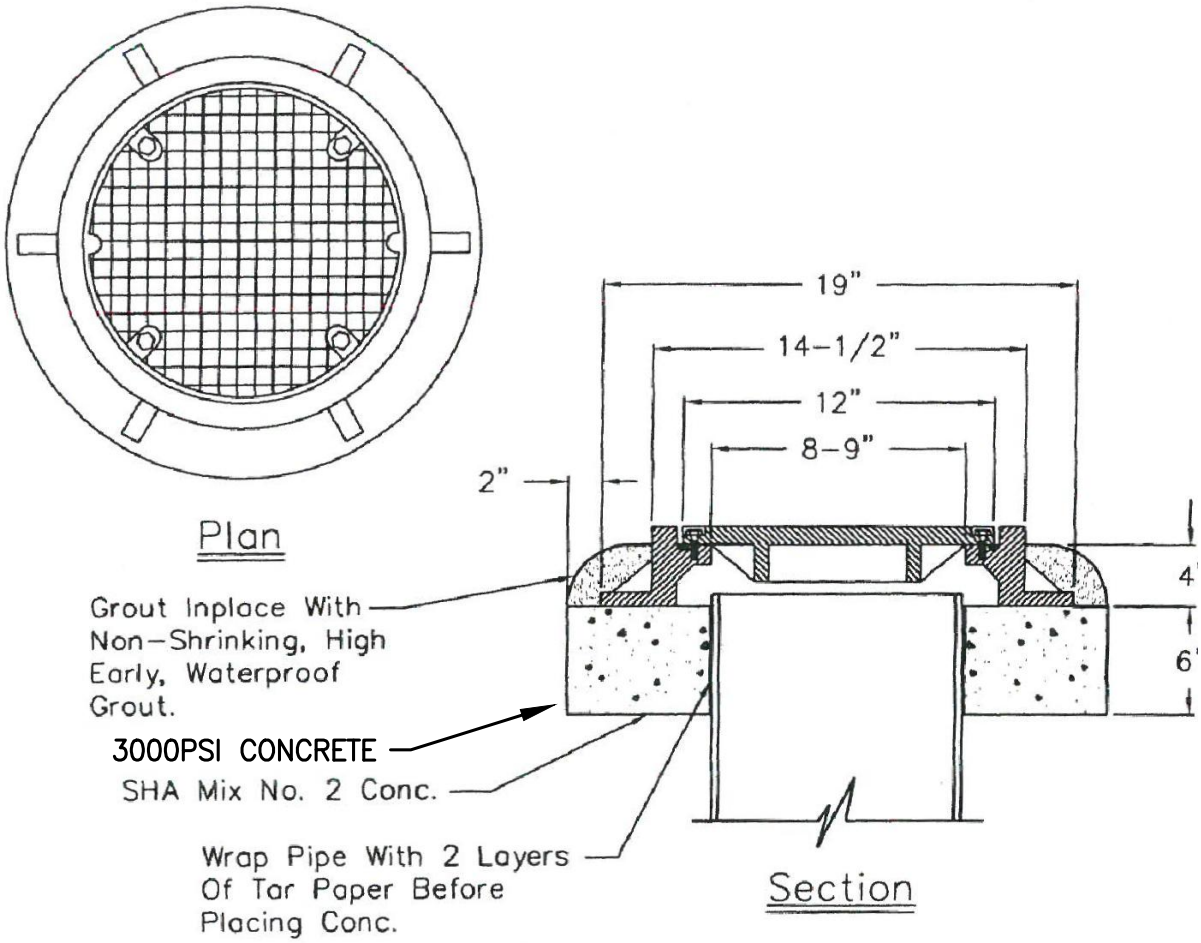


NOTES:

1. ADD WARNING TAPE TO ALL PIPES.

TOWN OF DENTON DEPARTMENT OF PUBLIC WORKS		SANITARY SEWER DETAILS MAINLINE CLEANOUT	REVISED DEC 2007 APR 2021	SHEET SS-3.00

G:\Projects\2020\200110 Town of Denton On-Call Services 2020-2025\Standards & Specs\Revised 2021 (GMB)\Manual\DETAILS\CAD\SANITARY SEWER.dwg May 04, 2021 - 3:23pm



NOTES:

1. CASTINGS SHALL CONFORM TO ASTM A-48 LATEST EDITION, CLASS 35 IRON MINIMUM.
2. CASTINGS SHALL HAVE GROUND OR MACHINED BEARING SURFACES.
3. CASTINGS SHALL BE OF UNIFORM QUALITY, FREE FROM BLOW HOLES, POROSITY, HARD SPOTS, SHRINKAGE DEFECTS, OR OTHER INJURIOUS DEFECTS.
4. CASTING SHALL BE HEAVY DUTY ROADWAY TYPE.
5. FRAME & COVER SHALL BE EJIW MODEL 1566 FOR 6" OR 1564 FOR 8" AS MANUFACTURED BY EAST JORDEN IRON WORKS, EAST JORDEN, MI. OR AN APPROVED EQUAL.

TOWN OF DENTON DEPARTMENT OF PUBLIC WORKS	SANITARY SEWER DETAILS	REVISED	SHEET
	WATERTIGHT MAINLINE CLEANOUT FRAME & COVER	DEC 2007 APR 2021	SS-3.10

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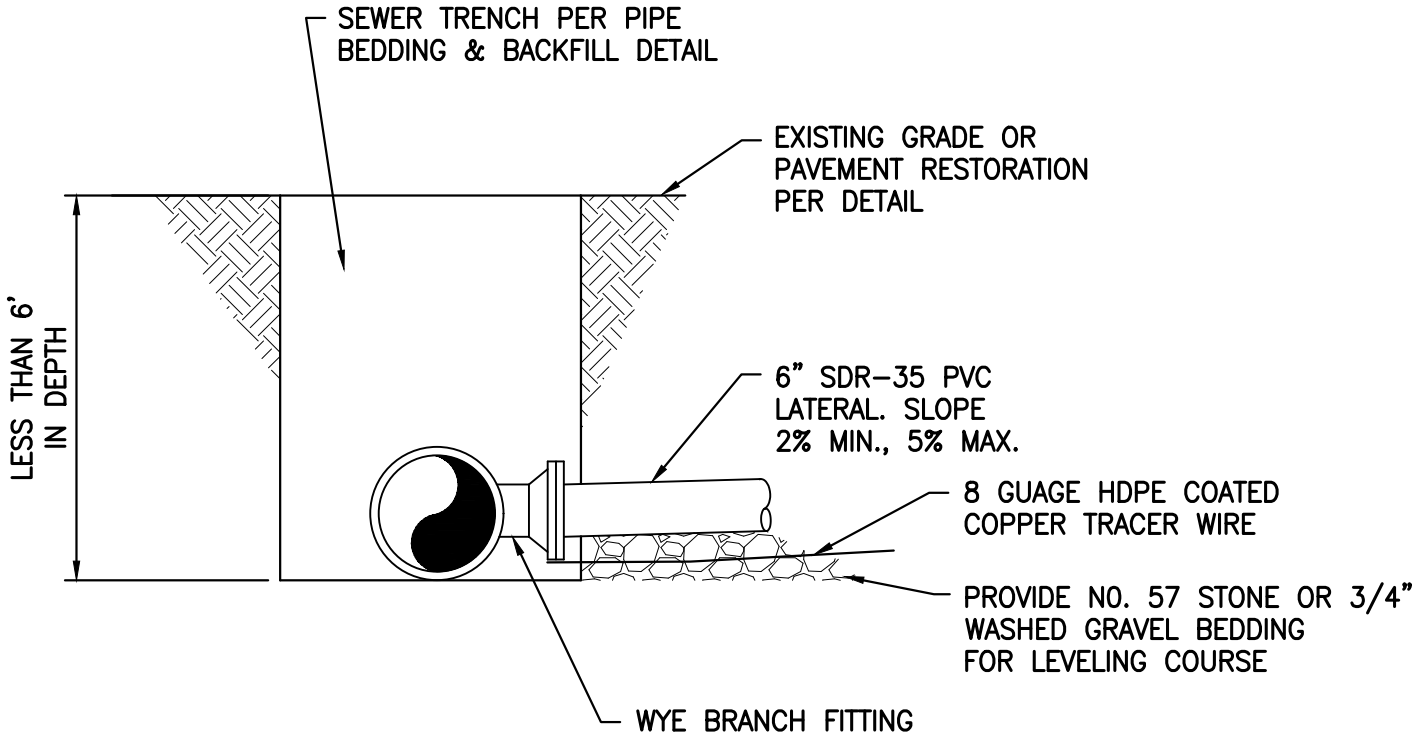

SHALLOW MAIN

NOTES:

1. ADD WARNING TAPE 12" MINIMUM BELOW GRADE ABOVE LATERAL FROM MAIN TO HOUSE.
2. SEE CLEAN OUT DETAILS FOR CONTINUATION.

TOWN OF DENTON DEPARTMENT OF PUBLIC WORKS	SANITARY SEWER DETAILS STANDARD HOUSE CONNECTIONS SHALLOW MAIN	REVISED DEC 2007 APR 2021	SHEET SS-4.00

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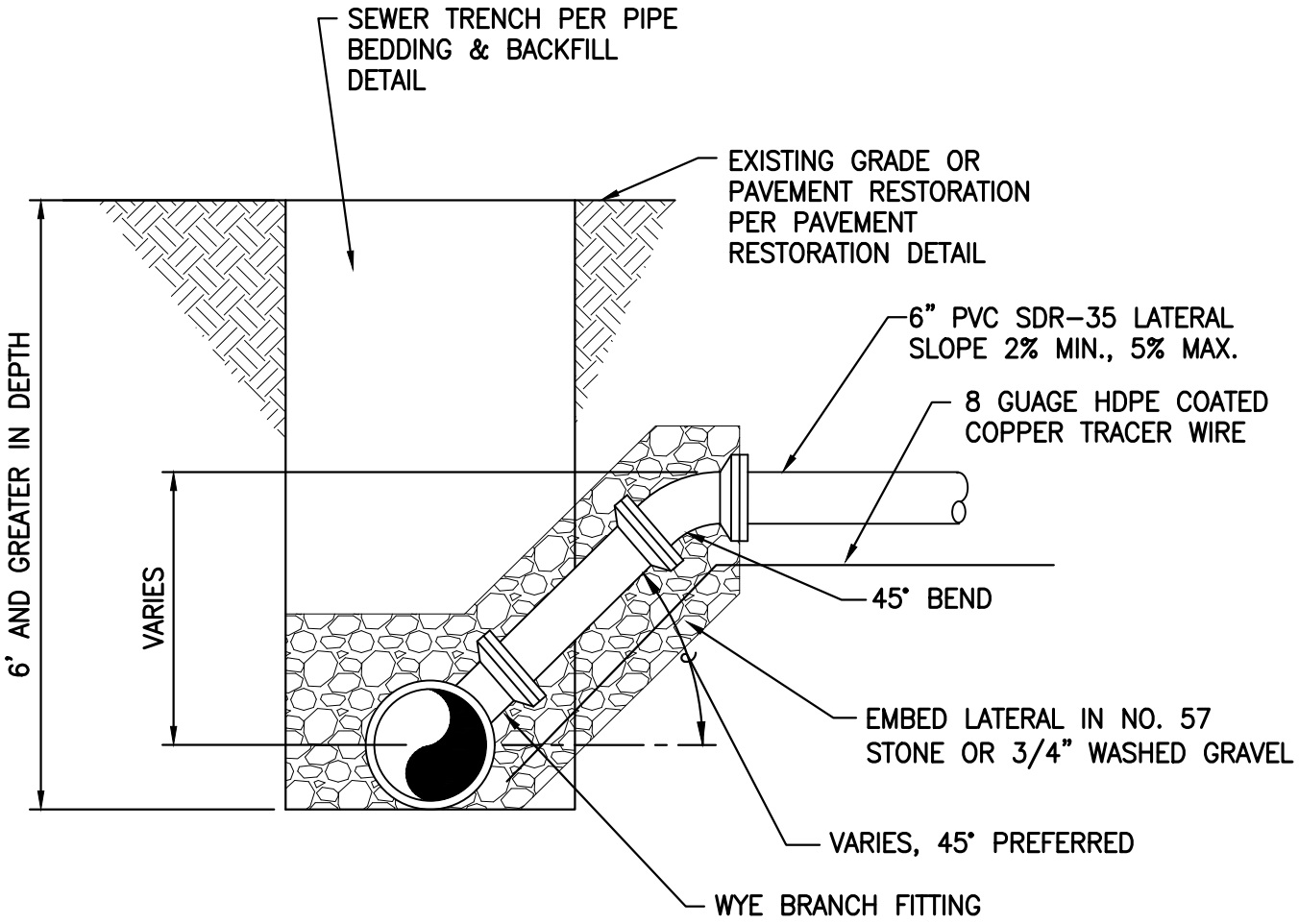

DEEP MAIN

NOTES:

1. ADD WARNING TAPE 12" MINIMUM BELOW GRADE ABOVE LATERAL FROM MAIN TO HOUSE.
2. SEE CLEAN OUT DETAILS FOR CONTINUATION.

TOWN OF DENTON DEPARTMENT OF PUBLIC WORKS		SANITARY SEWER DETAILS STANDARD HOUSE CONNECTIONS DEEP MAIN	REVISED DEC 2007 APR 2021	SHEET SS-4.10

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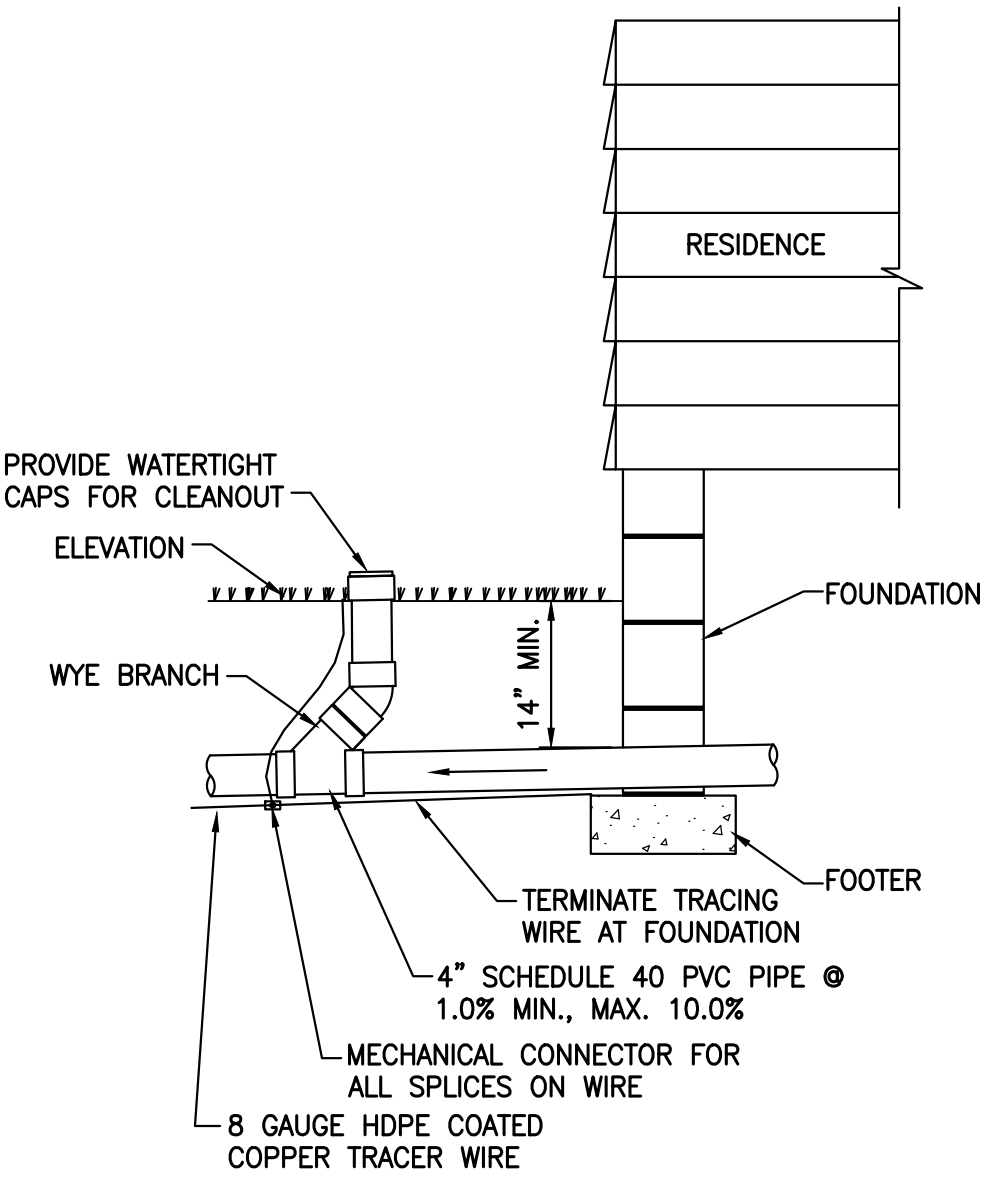

TOWN OF DENTON DEPARTMENT OF PUBLIC WORKS		SANITARY SEWER DETAILS HOUSE CONNECTION	REVISED DEC 2007 APR 2021	SHEET SS-5.00

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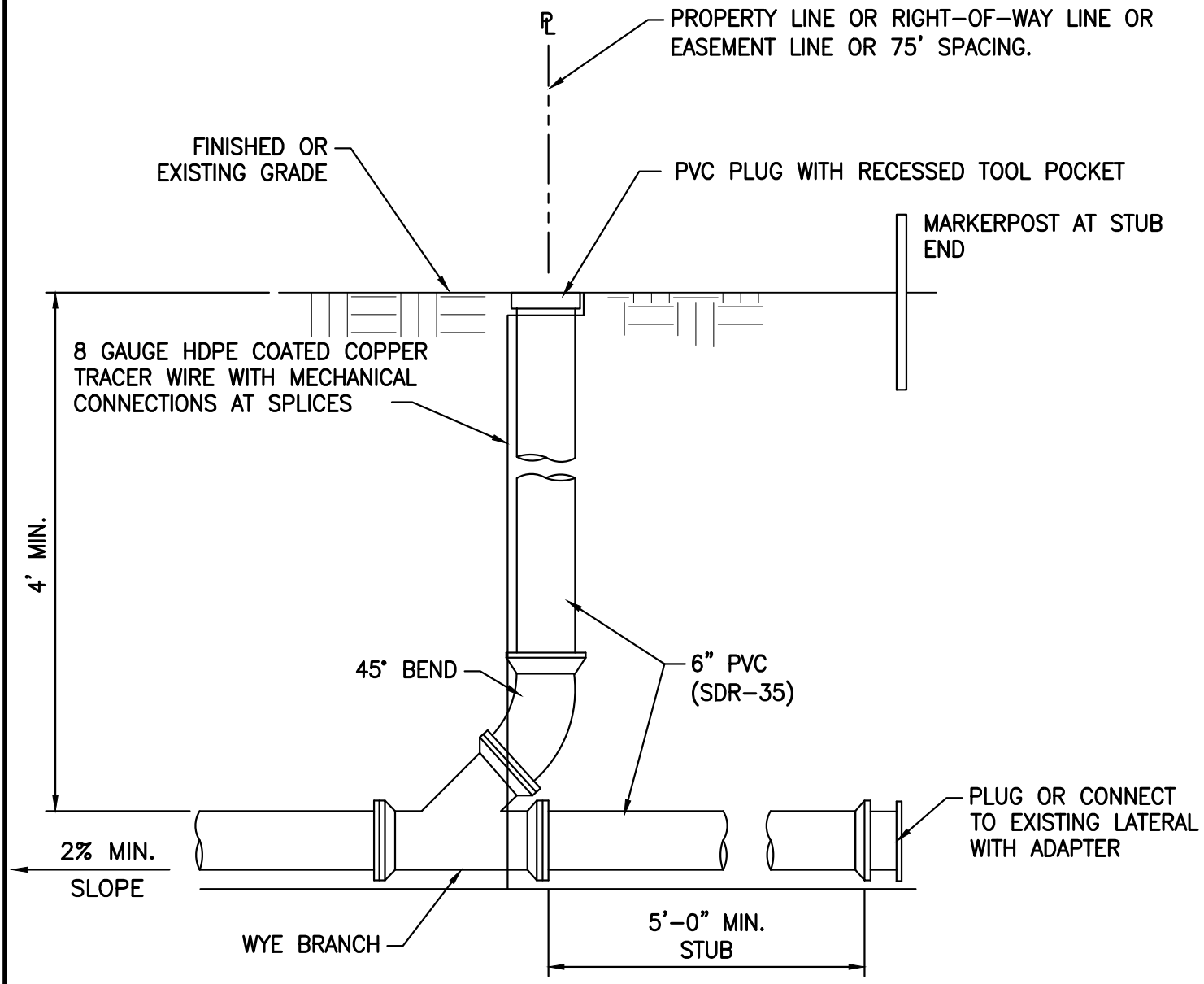

NOTES:

1. C.O. NOT TO BE LOCATED IN DITCH, SWALE, ETC.
2. MAINTAIN 10' MIN. SEPARATION BETWEEN WATER AND SEWER LINES.
3. SEE HOUSE CONNECTION DETAIL FOR CONTINUATION.
4. ADD WARNING TAPE 12" MINIMUM BELOW GRADE ABOVE LATERAL FROM MAIN TO STRUCTURE.

TOWN OF DENTON DEPARTMENT OF PUBLIC WORKS	SANITARY SEWER DETAILS LATERAL CLEANOUT FOR GRASS AREAS	REVISED DEC 2007 APR 2021	SHEET SS-5.10

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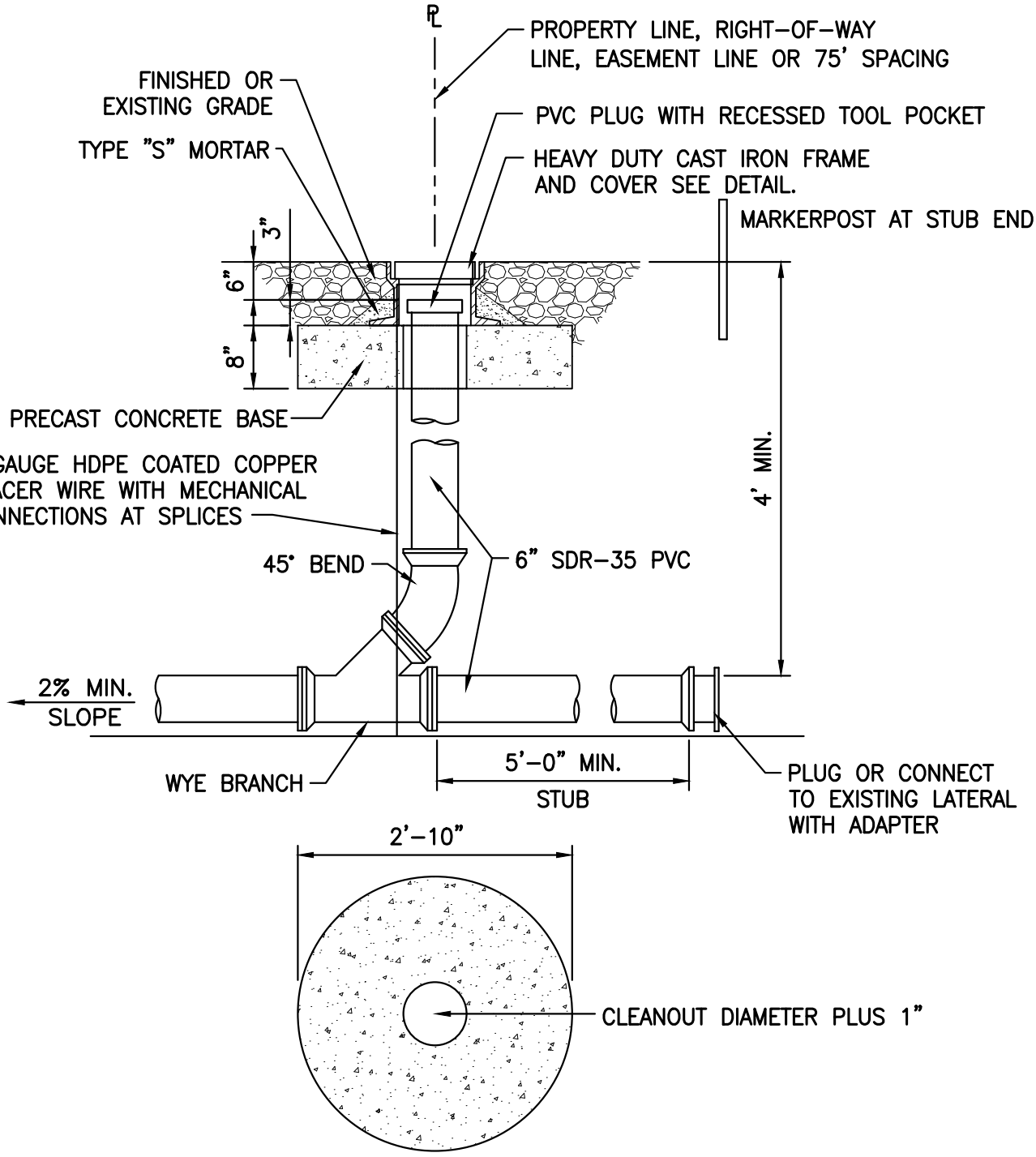

PRECAST CONCRETE BASE PLAN

NOTES:

1. C.O. NOT TO BE LOCATED IN DITCH, SWALE, ETC.
2. MAINTAIN 10' MIN. SEPARATION BETWEEN WATER AND SEWER LINES.
3. SEE HOUSE CONNECTION DETAIL FOR CONTINUATION.
4. ADD WARNING TAPE 12" MINIMUM BELOW GRADE ABOVE LATERAL FROM MAIN TO STRUCTURE.

TOWN OF DENTON DEPARTMENT OF PUBLIC WORKS	SANITARY SEWER DETAILS LATERAL CLEANOUT FOR TRAFFIC AREAS	REVISED DEC 2007 APR 2021	SHEET SS-5.20

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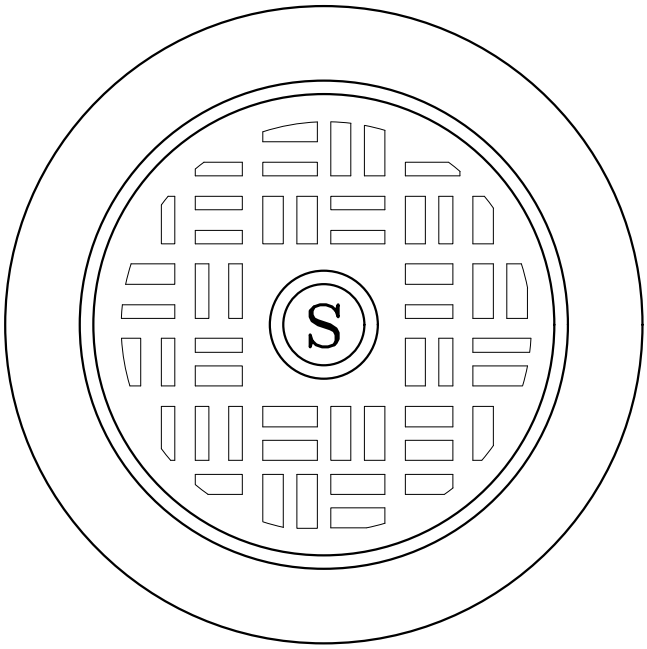
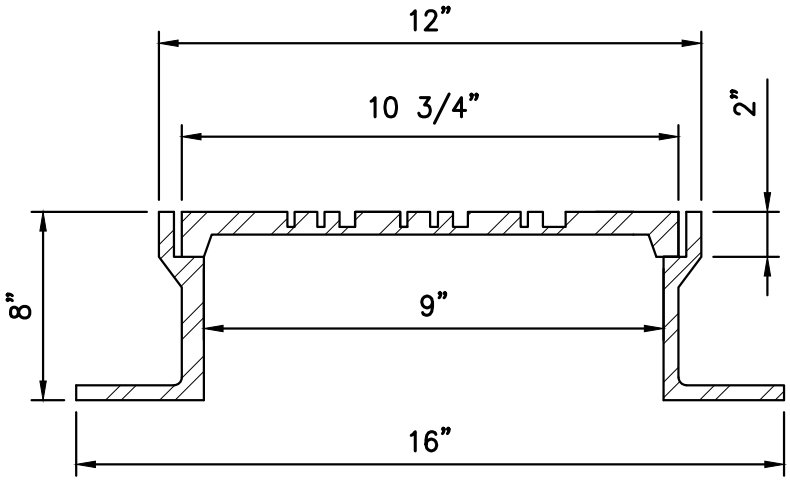


PLAN



SECTION

MATERIAL – CAST IRON ASTM–A–48 CLASS 35
WEIGHT – APPROX. 130 LBS.

NOTES:

FOR USE WITH TRAFFIC BEARING SANITARY SEWER LATERAL CLEANOUT.

TOWN OF DENTON DEPARTMENT OF PUBLIC WORKS		SANITARY SEWER DETAILS HEAVY DUTY CLEANOUT FRAME AND COVER	REVISED DEC 2007 APR 2021	SHEET SS–6.00

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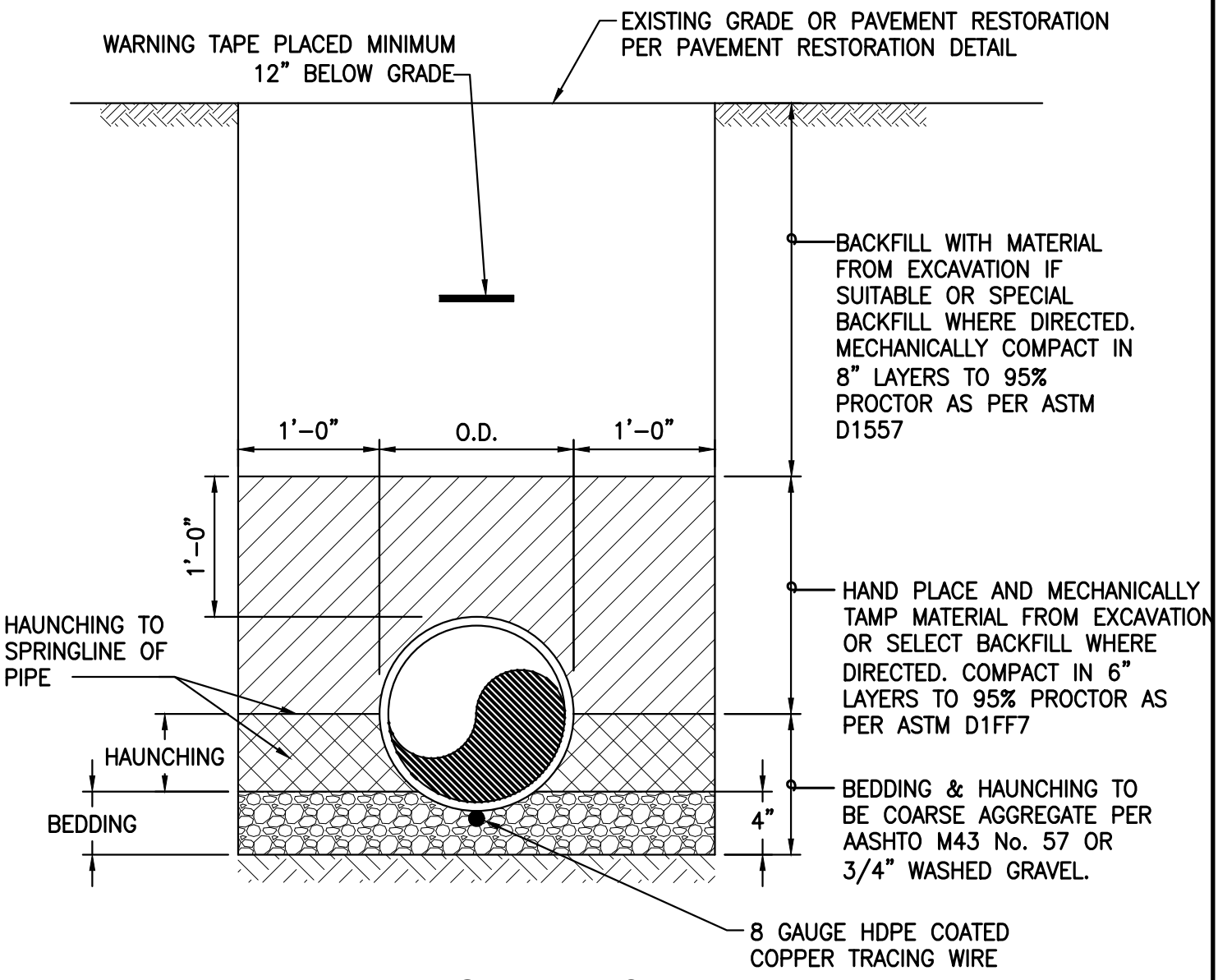


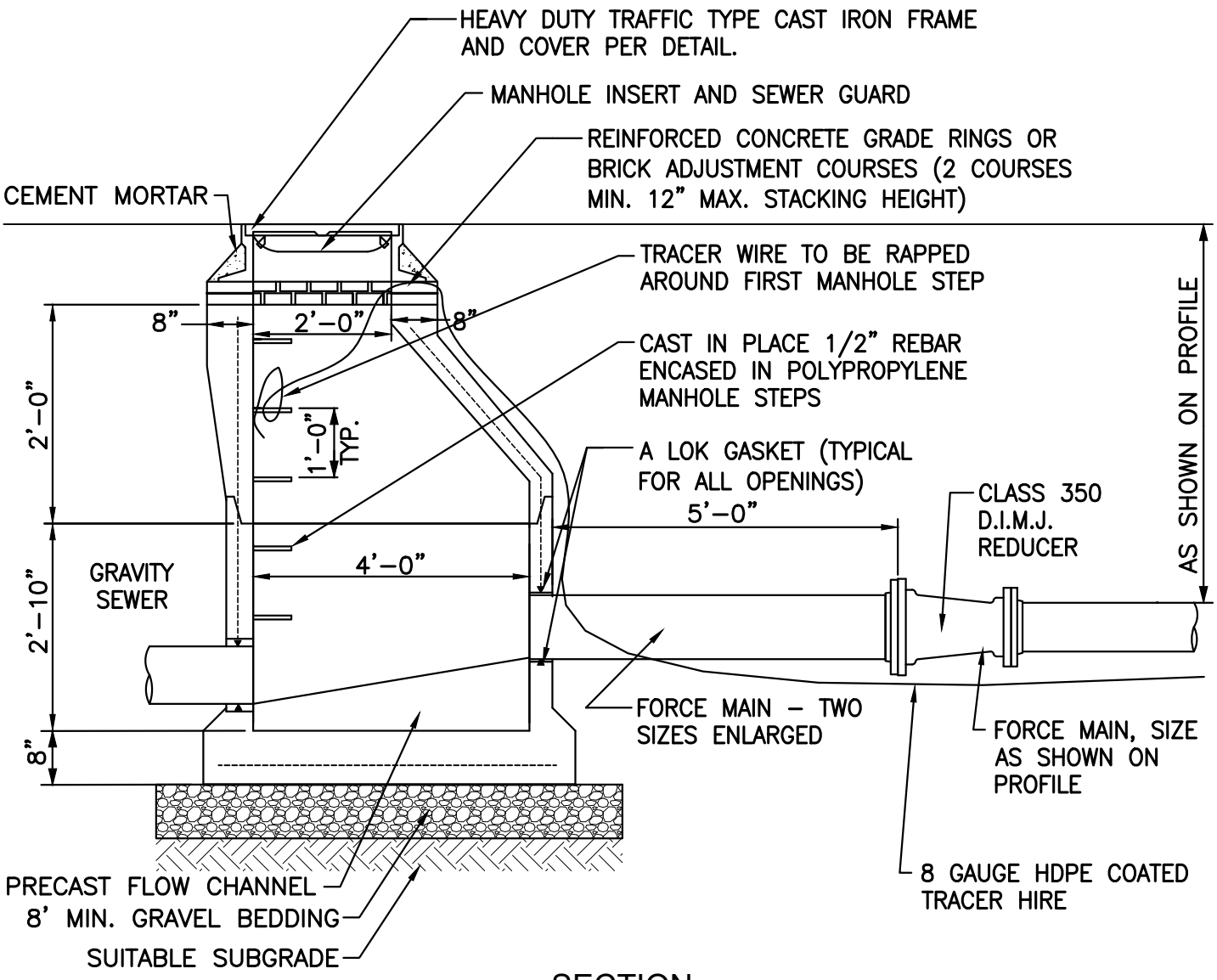
PIPE BEDDING AND BACKFILL DETAIL

NOTES:

1. WARNING TAPE SHALL BE PLACED 24" ABOVE ALL PIPE OR MIN. 12" BELOW GRADE.
2. THE 8 GAUGE HDPE COATED COPPER TRACING WIRE SHALL BE A CONTINUOUS CONDUCTOR.
3. ALL FITTINGS SHALL BE AS SPECIFIED IN AWWA C110 MECHANICAL JOINT, DUCTILE IRON, PRESSURE RATED AT 350 PSI.
4. ALL FITTINGS SHALL BE RESTRAINED BY THRUST BLOCKS ACCORDING TO STANDARD DETAILS.
5. FIRM BEARING SHALL BE PROVIDED FOR FULL LENGTH OF BARREL. EXCAVATED FOR BELL HOLES.
6. ALL FM VALVES OPEN COUNTER-CLOCKWISE.

TOWN OF DENTON DEPARTMENT OF PUBLIC WORKS	SANITARY SEWER DETAILS PVC FORCE MAIN INSTALLATION	REVISED DEC 2007 APR 2021	SHEET SS-7.00

G:\Projects\2020\200110 Town of Denton On-Call Services 2020-2025\Standards & Specs\Revised 2021 (GMB)\Manual\DETAILS\CAD\SANITARY SEWER.dwg May 04, 2021 - 3:24pm



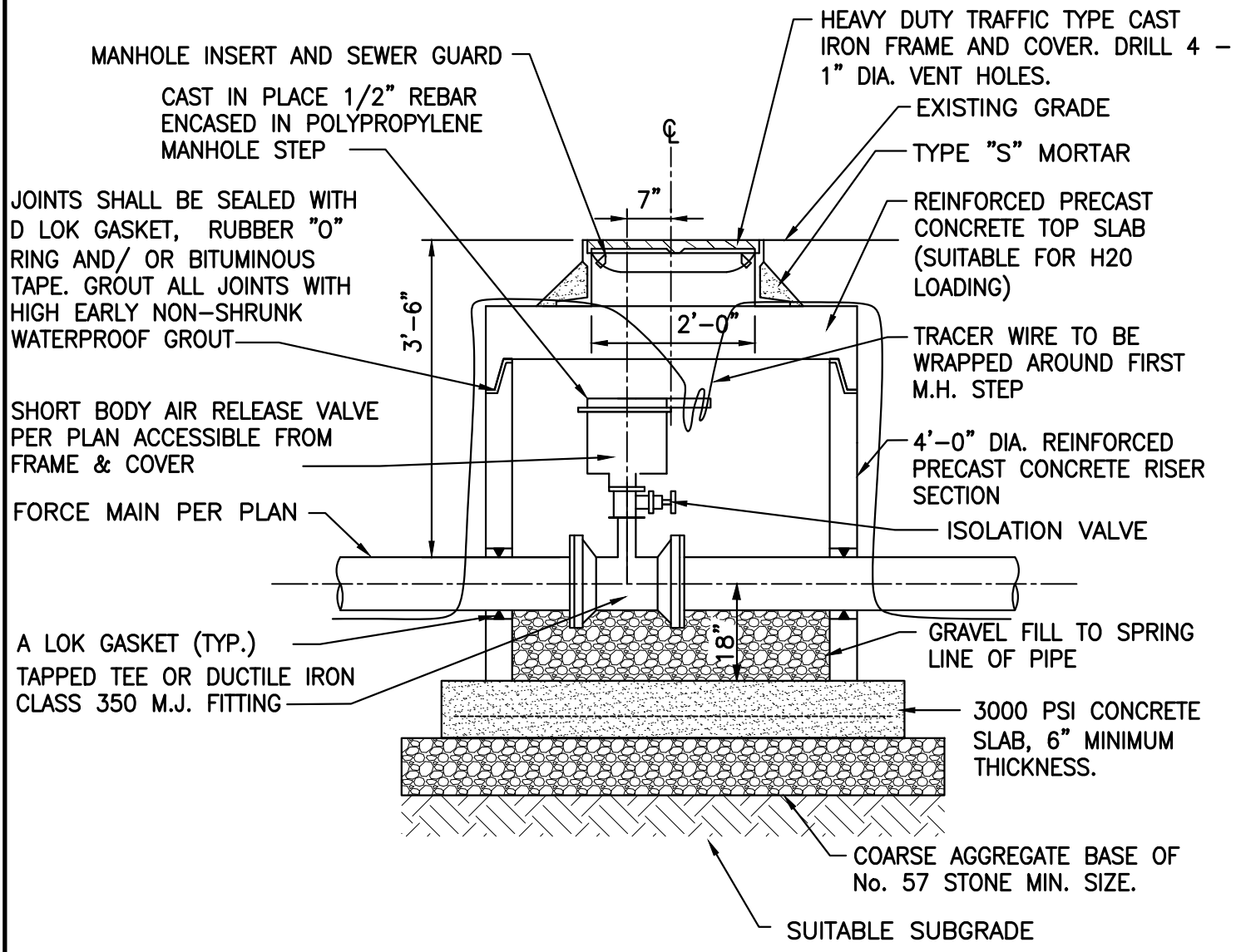
SECTION

NOTES:

1. MANHOLE SHALL CONFORM TO ASTM C–478, LATEST EDITION.
2. STRUCTURE SHALL BE PRECAST CONCRETE. REFER TO CONSTRUCTION DETAILS, AS APPLICABLE PER PRECAST CONCRETE MANHOLE DETAIL.
3. REFER TO APPROVED CONSTRUCTION PLANS FOR AIR RELEASE VALVE, PIPE AND OTHER SPECIFICATIONS.
4. PROVIDE WARNING TAPE 12" MINIMUM BELOW GRADE ABOVE FORCE MAIN.
5. PROVIDE 8 GAUGE HDPE COATED COPPER TRACER WIRE BELOW FORCE MAIN.

TOWN OF DENTON DEPARTMENT OF PUBLIC WORKS	SANITARY SEWER DETAILS FORCE MAIN DISCHARGE MANHOLE	REVISED DEC 2007 APR 2021	SHEET SS–7.10

G:\Projects\2020\200110 Town of Denton On-Call Services 2020-2025\Standards & Specs\Revised 2021 (GMB)\Manual\DETAILS\CAD\SANITARY SEWER.dwg May 04, 2021 - 3:24pm

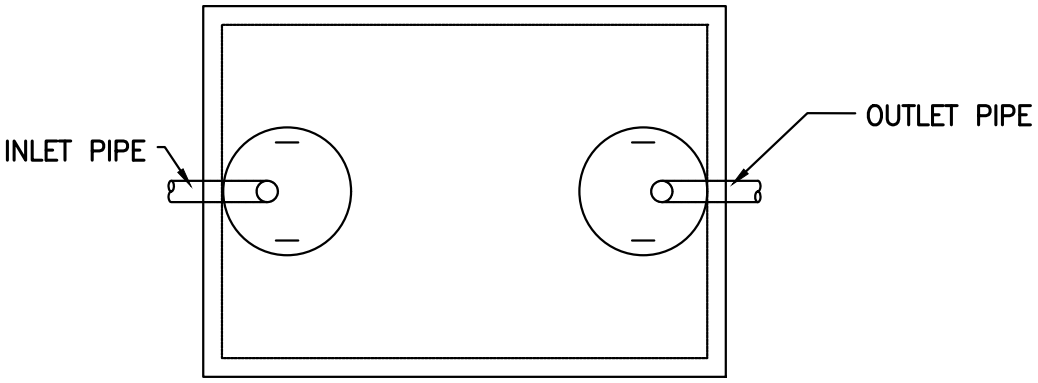


NOTES:

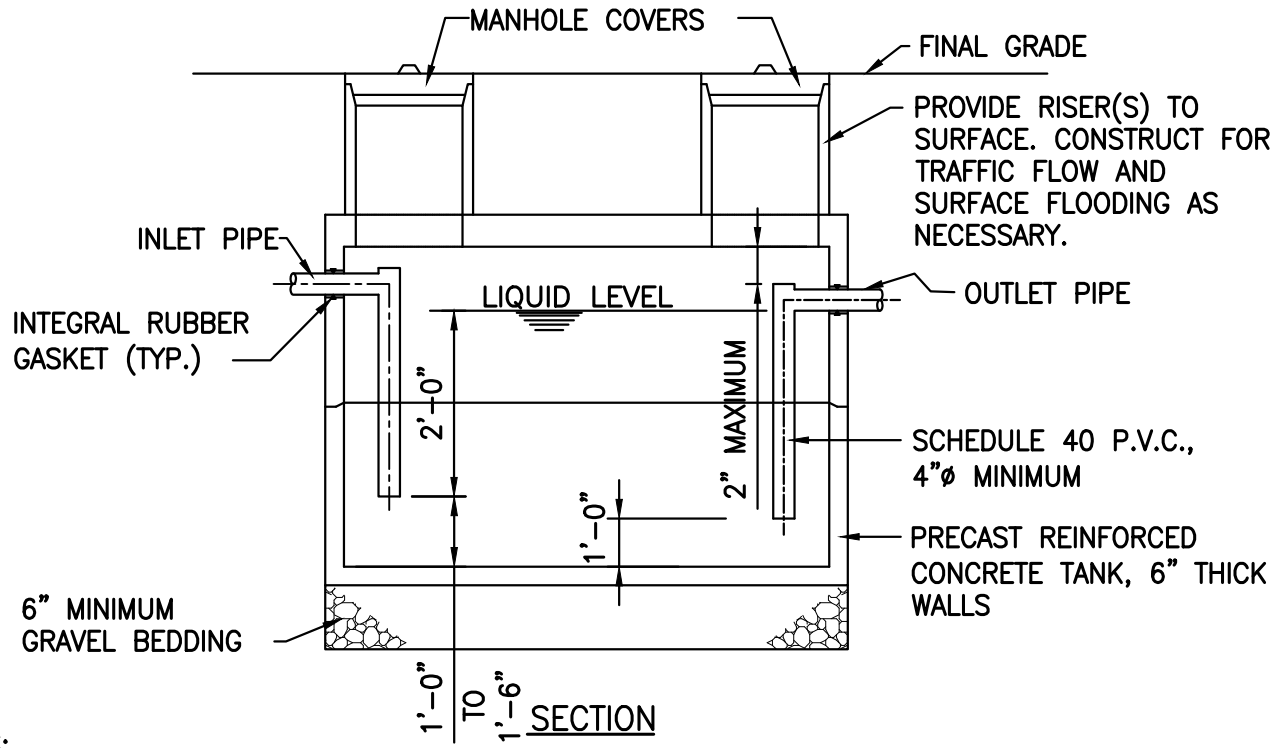
1. STRUCTURE SHALL BE PRECAST CONCRETE. REFER TO CONSTRUCTION DETAILS, AS APPLICABLE PER PRECAST CONCRETE MANHOLE DETAIL.
2. REFER TO APPROVED CONSTRUCTION PLANS FOR AIR RELEASE VALVE, PIPE AND OTHER SPECIFICATIONS.
3. PROVIDE WARNING TAPE 12" MINIMUM BELOW GRADE ABOVE FORCE MAIN.
4. PROVIDE 8 GAUGE HDPE COATED COPPER TRACER WIRE BELOW FORCE MAIN.

TOWN OF DENTON DEPARTMENT OF PUBLIC WORKS	SANITARY SEWER DETAILS AIR RELEASE VALVE	REVISED DEC 2007 APR 2021	SHEET SS-7.20

G:\Projects\2020\200110 Town of Denton On-Call Services 2020-2025\Standards & Specs\Revised 2021 (GMB)\Manual\DETAILS\CAD\SANITARY SEWER.dwg May 04, 2021 - 3:24pm



PLAN



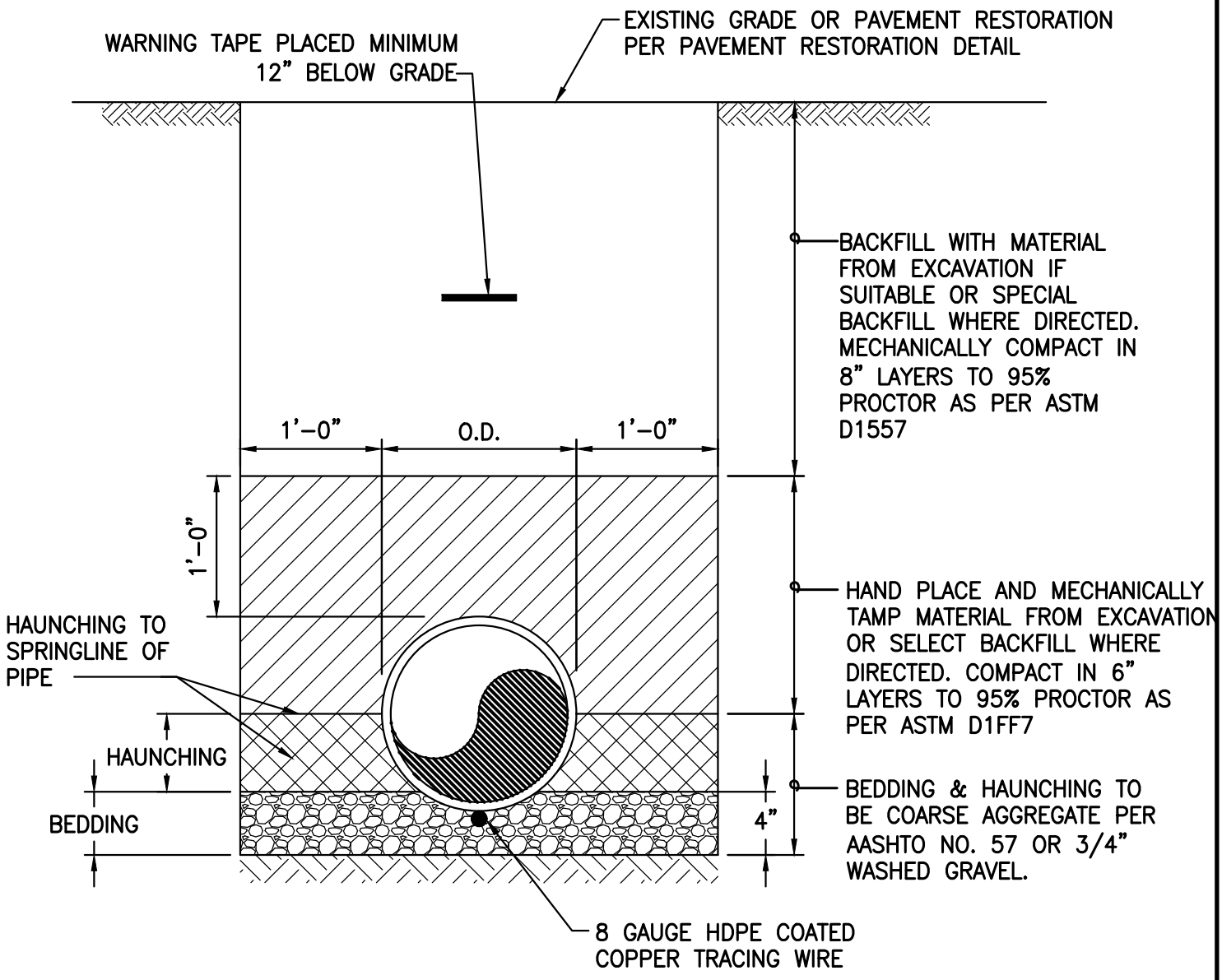
SECTION

NOTES:

1. GREASE TRAP SHALL BE SIZED SUCH THAT GREASE RETENTION CAPACITY IS EQUAL TO AT LEAST TWICE THE PEAK FLOW CAPACITY IN GPM.
2. SEAL ALL SEAMS WITH TYPE "S" NON-SHRINK GROUT.
3. TRAP SHALL HAVE INTEGRAL RUBBER GASKETS FOR INLET AND OUTLET CONNECTIONS.
4. TANK SHALL HAVE TOP SEAM.
5. WHENEVER PRACTICAL ALL OPENINGS MUST BE ABOVE THE SEASONAL HIGH WATER TABLE.

TOWN OF DENTON DEPARTMENT OF PUBLIC WORKS	DENTON PUBLIC WORKS	SANITARY SEWER DETAILS GREASE TRAP	REVISED DEC 2007	SHEET SS-8.00

G:\Projects\2020\200110 Town of Denton On-Call Services 2020-2025\Standards & Specs\Revised 2021 (GMB)\Manual\DETAILS\CAD\SANITARY SEWER.dwg May 04, 2021 - 3:24pm



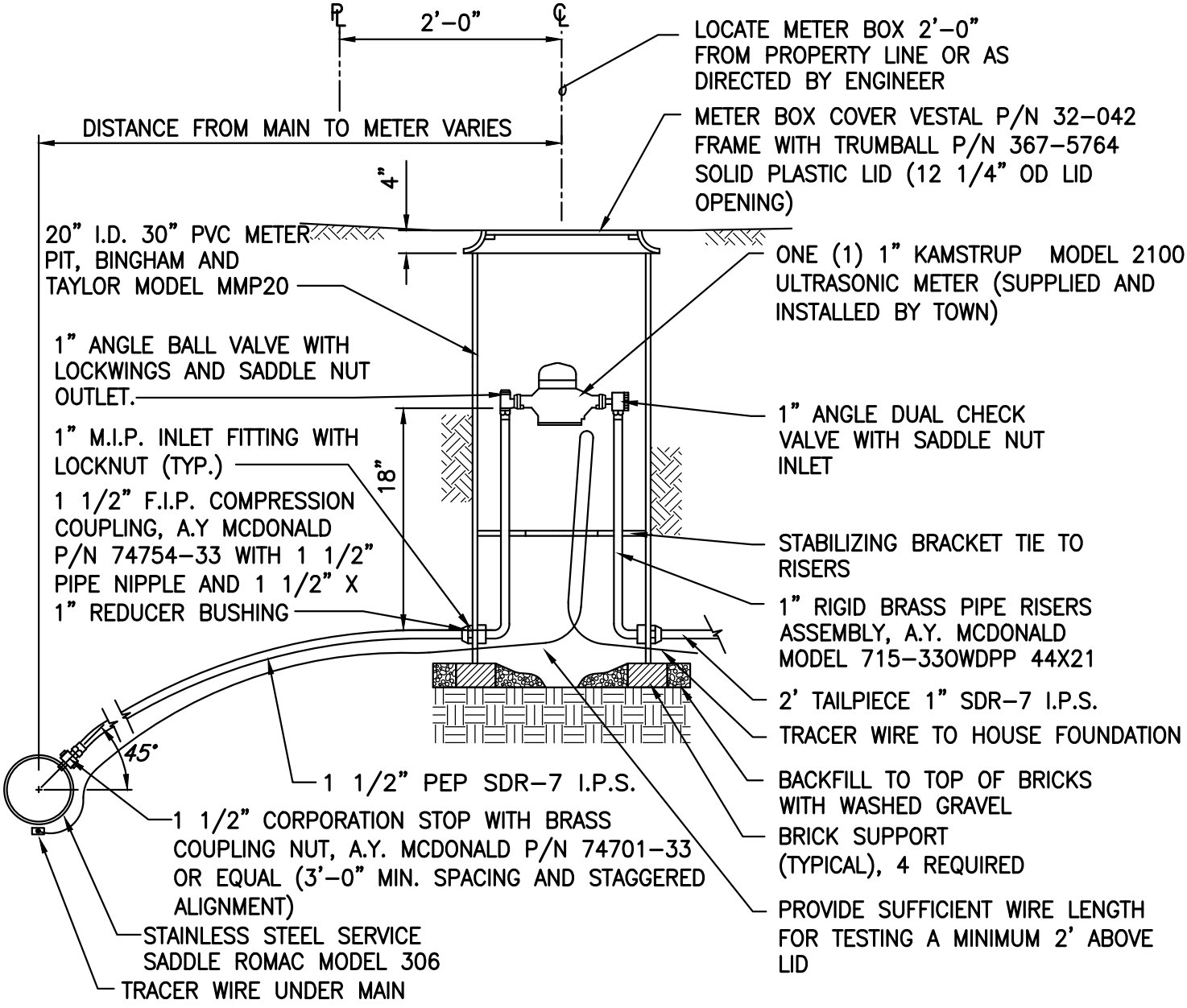
PIPE BEDDING AND BACKFILL DETAIL

NOTES:

1. WARNING TAPE SHALL BE PLACED 12" MINIMUM BELOW GRADE ABOVE ALL PIPE.
2. THE HDPE COATED COPPER TRACING WIRE SHALL BE A CONTINUOUS CONDUCTOR. CONNECT TO ALL FITTINGS, FIRE HYDRANTS AND SERVICES.
3. ALL FITTINGS SHALL BE AS SPECIFIED IN AWWA C110-93, MECHANICAL JOINT, DUCTILE IRON, PRESSURE RATED AT 350 PSI.
4. ALL FITTINGS SHALL BE RESTRAINED BY THRUST BLOCKS ACCORDING TO STANDARD DETAILS.
5. FIRM BEARING SHALL BE PROVIDED FOR FULL LENGTH OF BARREL. EXCAVATE FOR BELL HOLES.

TOWN OF DENTON DEPARTMENT OF PUBLIC WORKS		WATER MAIN DETAILS PVC WATER MAIN INSTALLATION AND COVER	REVISED DEC 2007 APR 2021	SHEET W-1.00

G:\Projects\2020\200110 Town of Denton On-Call Services 2020-2025\Standards & Specs\Revised 2021 (GMB)\Manual\DETAILS\CAD\WATER.dwg May 04, 2021 - 3:24pm

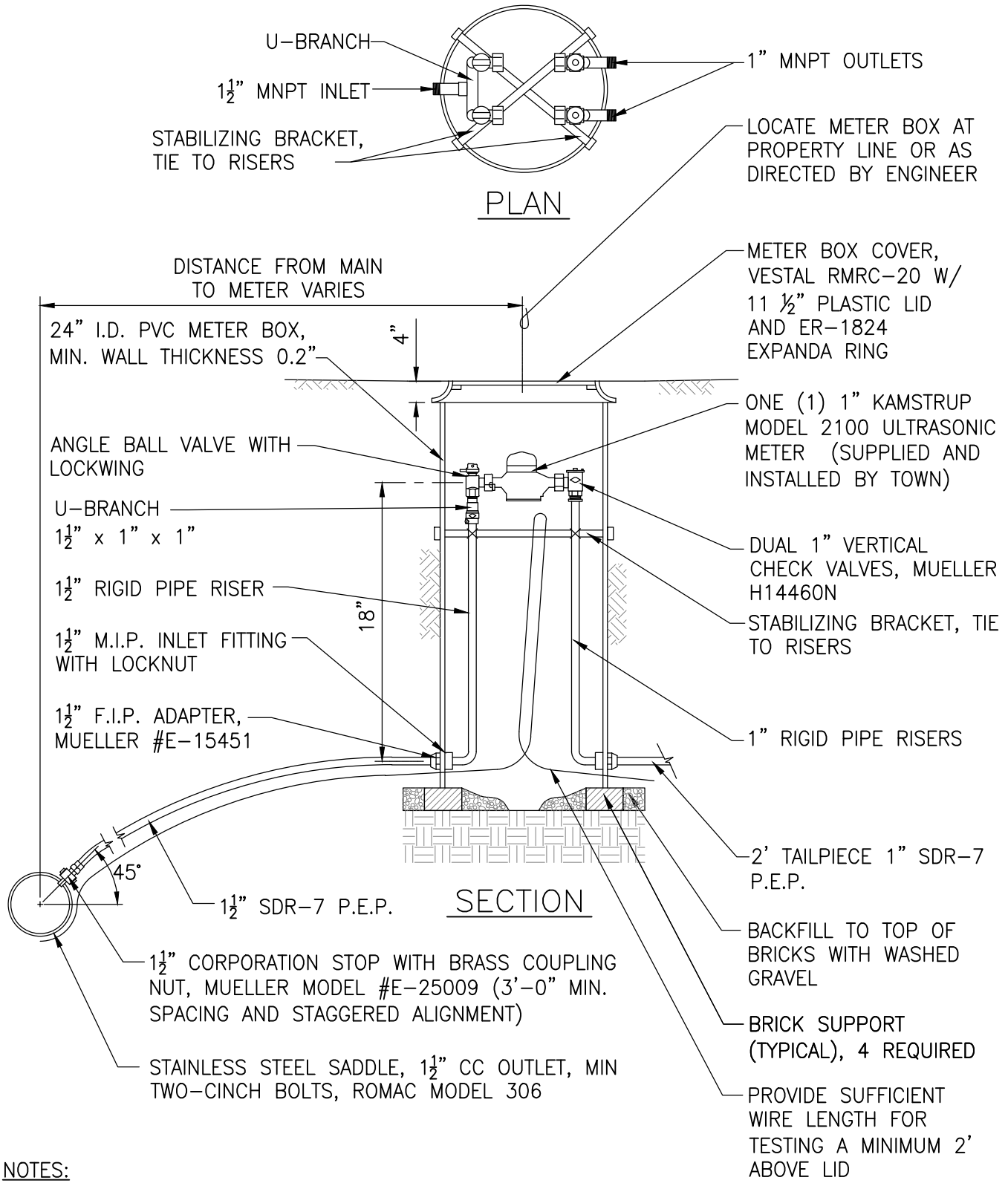


NOTES:

1. USE S.S. LINERS IN TUBING AT COMPRESSION CONNECTIONS (A.Y. MCDONALD P/N 6136).
2. PROVIDE WARNING TAPE AND 8 GAUGE HDPE COATED COPPER TRACER WIRE.
3. MAINTAIN 36" MIN. COVER ON WATER SERVICE LINE FROM MAIN TO BUILDING.
4. PE4710 POLYETHYLENE SDR–7 PIPE SHALL BE AS MANUFACTURERED BY JM EAGLE, LOS ANGELES, CA OR APPROVED EQUAL.
5. A.Y. MCDONALD 1" RISER ASSEMBLY MODEL 715–330WDPP 44X21 INCLUDES: 1" ANGLE LOCK WING BALL VALVE, 1" ANGLE DUAL CHECK VALVE, 1"X18" BRASS RISER WITH 1" MIPT INLET AND OUTLET.
6. CERTIFIED FIRE SUPPRESSION SYSTEM DESIGNER SHALL VERIFY LINE SIZE REQUIREMENTS TO STRUCTURE.

TOWN OF DENTON DEPARTMENT OF PUBLIC WORKS		WATER MAIN DETAILS STANDARD 1" WATER METER & 1 1/2" SERVICE CONNECTION	REVISED DEC 2007 NOV 2009 APR 2021	SHEET W–2.00

G:\Projects\2020\200110 Town of Denton On-Call Services 2020-2025\Standards & Specs\Revised 2021 (GMB)\Manual\DETAILS\CAD\WATER.dwg May 27, 2021 - 10:02am

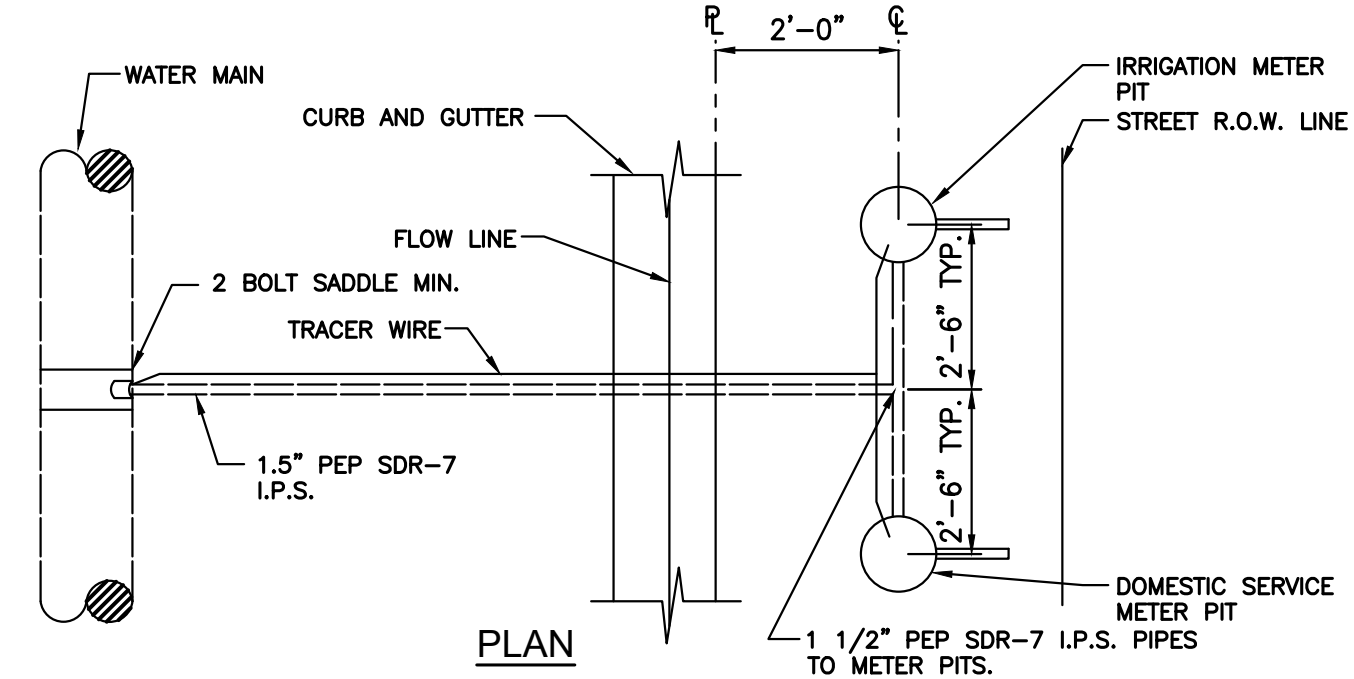


NOTES:

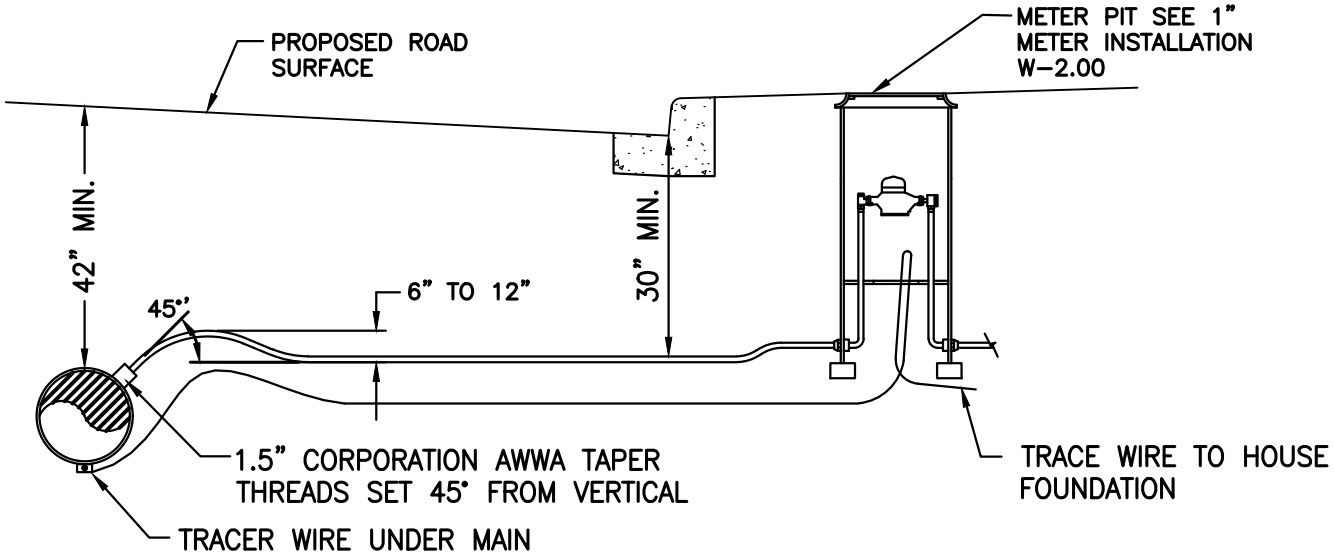
1. USE S.S. LINERS IN TUBING AT COMPRESSION CONNECTIONS (MUELLER MODEL #529116, 505142).
2. PIT SETTER SHALL BE EQUAL TO MUELLER 330RD2430FDBS000454N.
3. PROVIDE WARNING TAPE AND 8 GUAGE UNCOATED COPPER TRACER WIRE
4. MAINTAIN 36" MIN. COVER ON WATER SERVICE LINE FROM MAIN TO BUILDING.

TOWN OF DENTON DEPARTMENT OF PUBLIC WORKS		WATER MAIN DETAILS **DUAL WATER METER**	REVISED DEC 2007 APR 2023	SHEET W-3.00

G:\Projects\2020\200110 Town of Denton On-Call Services 2020-2025\Standards & Specs\Revised 2023 (CMB)\WATER.dwg Apr 25, 2023 - 9:57am



PLAN



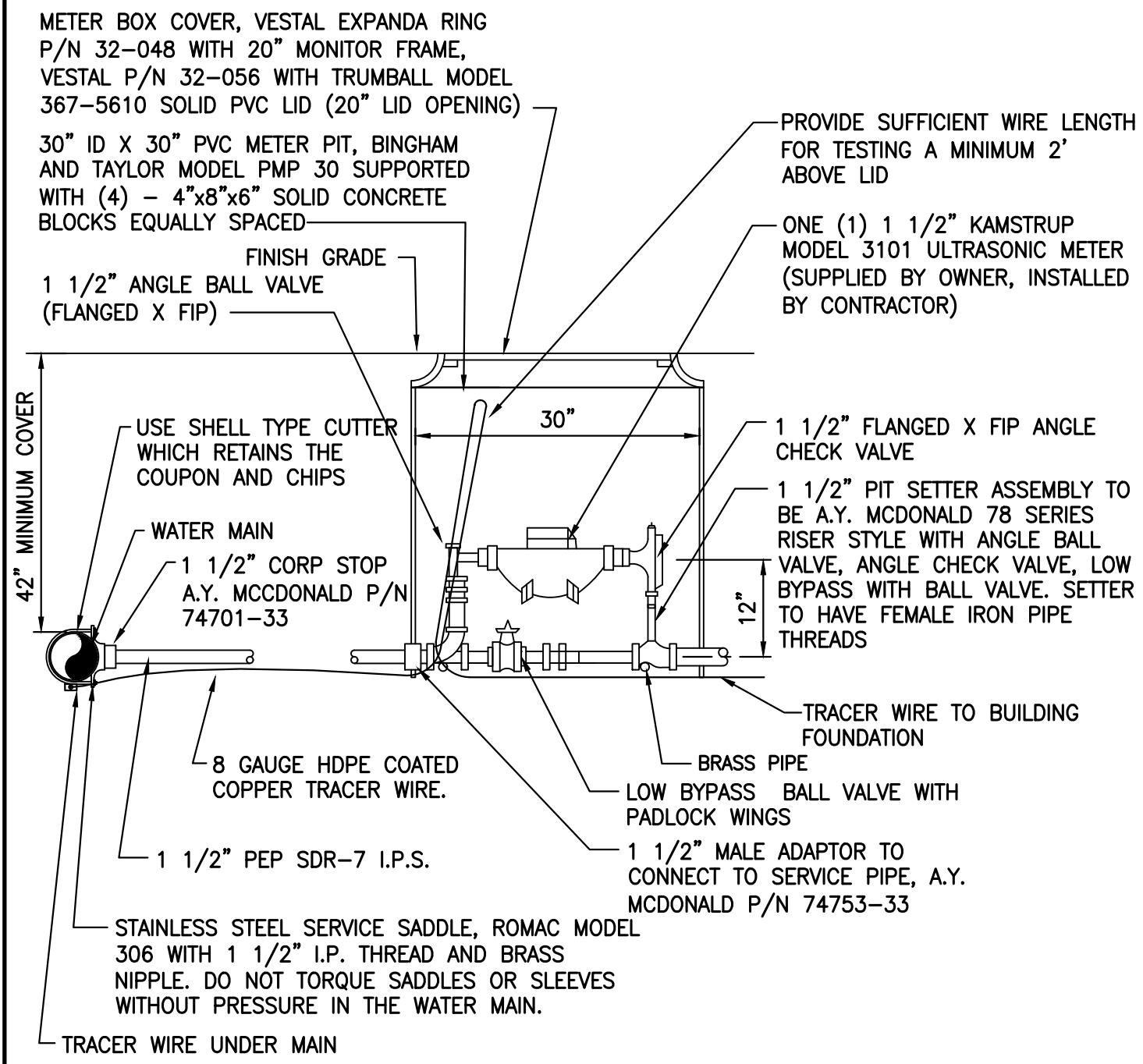
PROFILE

NOTES:

1. COPPER TRACER WIRE TO BE LAID LEVEL WITH BOTTOM OF MAIN UNLESS OTHERWISE DIRECTED BY ENGINEER.
2. CORPORATION COCK TO BE LEFT OPEN. METER ANGLE VALVE LEFT CLOSED.
3. ADD DETECTOR TAPE AND TRACER WIRE TO ALL PIPE.
4. PE4710 POLYETHYLENE SDR-7 PIPE SHALL BE MANUFACTURED BY JM EAGLE, LOS ANGELES, CA, OR APPROVED EQUAL.
5. BACKFILL AND TAMP WITH SELECT MATERIAL TO PAD PIPE. SEE DETAIL.
6. CERTIFIED FIRE SUPPRESSION SYSTEM DESIGNER SHALL VERIFY LINE SIZE REQUIREMENTS TO STRUCTURE.

TOWN OF DENTON DEPARTMENT OF PUBLIC WORKS	DENTON PUBLIC WORKS	WATER MAIN DETAILS DOUBLE METER SERVICE INSTALLATION (IRRIGATION / DOMESTIC)	REVISED DEC 2007 NOV 2009 APR 2021	SHEET W-3.10

G:\Projects\2020\200110 Town of Denton On-Call Services 2020-2025\Standards & Specs\Revised 2021 (GMB)\Manual\DETAILS\CAD\WATER.dwg May 27, 2021 - 10:02am



NOTES:

1. WRAP ALL THREAD WITH TEFLON TAPE.
2. MAINTAIN 36" COVER ON WATER SERVICE FROM MAIN TO BUILDING.
3. ADD WARNING TAPE 12" MINIMUM BELOW GRADE ABOVE WATER SERVICE.
4. PE4710 POLYETHYLENE SDR-7 PIPE BY JM EAGLE, LOS ANGELES, CA OR APPROVED EQUAL.

TOWN OF DENTON DEPARTMENT OF PUBLIC WORKS		WATER MAIN DETAILS COMMERCIAL WATER METER AND 1 1/2" SERVICE CONNECTION	REVISED DEC 2007 APR 2021	SHEET W-4.00

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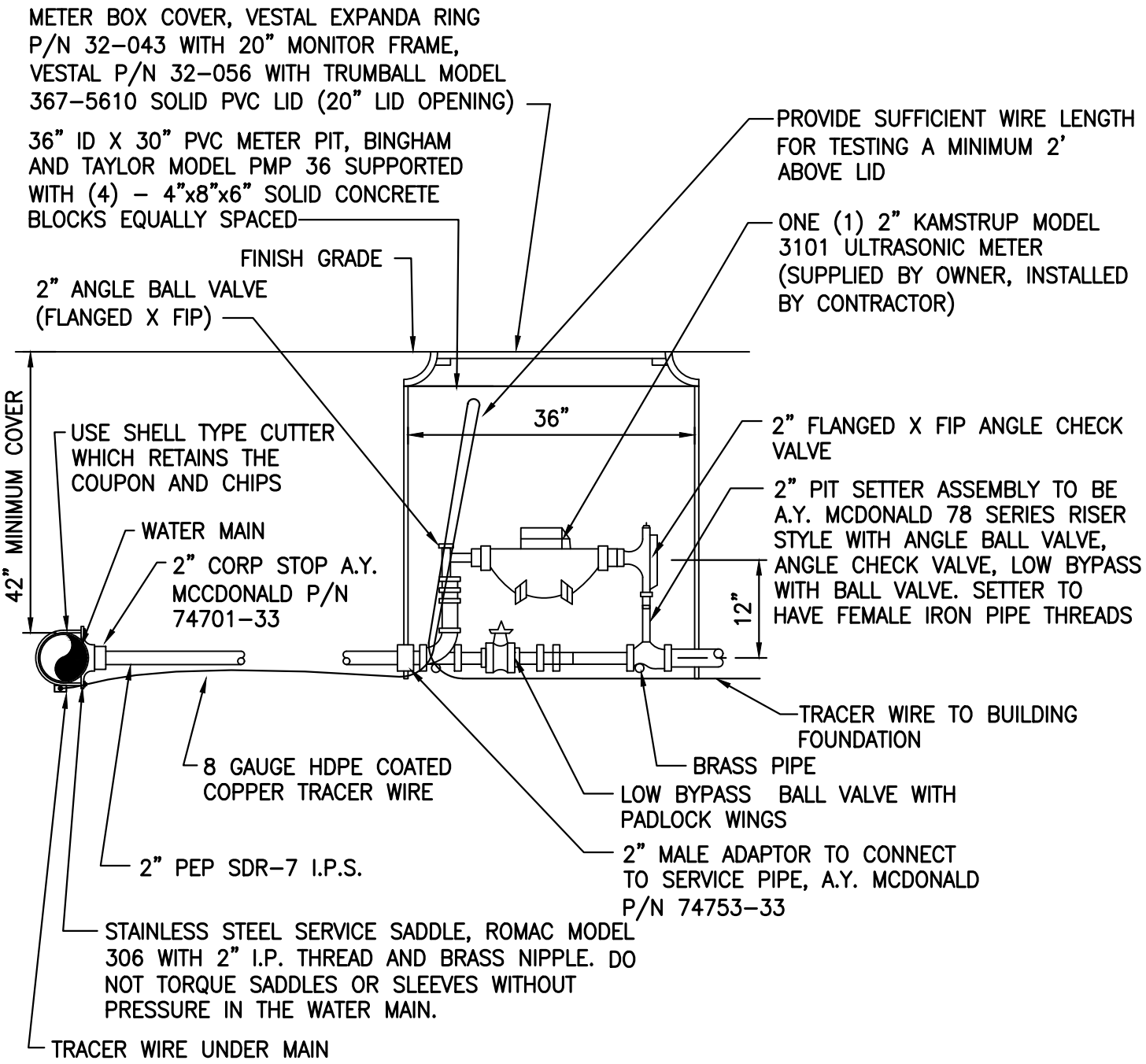

NOTES:

1. WRAP ALL THREAD WITH TEFLON TAPE.
2. MAINTAIN 36" COVER ON WATER SERVICE FROM MAIN TO BUILDING.
3. ADD WARNING TAPE 12" MINIMUM BELOW GRADE ABOVE WATER SERVICE.
4. PE4710 POLYETHYLENE SDR-7 PIPE BY JM EAGLE, LOS ANGELES, CA OR APPROVED EQUAL.

TOWN OF DENTON DEPARTMENT OF PUBLIC WORKS	DENTON PUBLIC WORKS	WATER MAIN DETAILS COMMERCIAL WATER METER AND 2" SERVICE CONNECTION	REVISED DEC 2007 APR 2021	SHEET W-4.10

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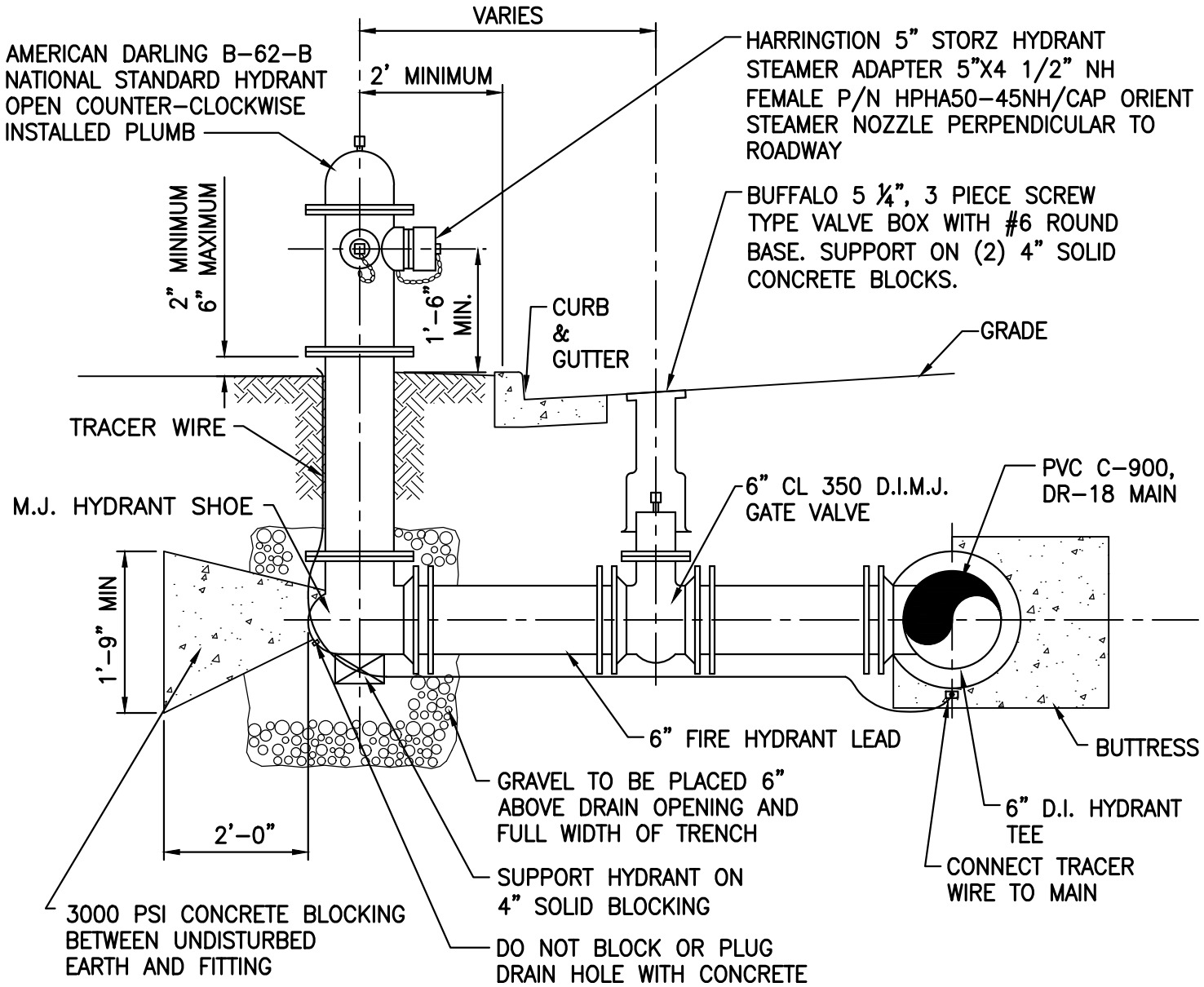
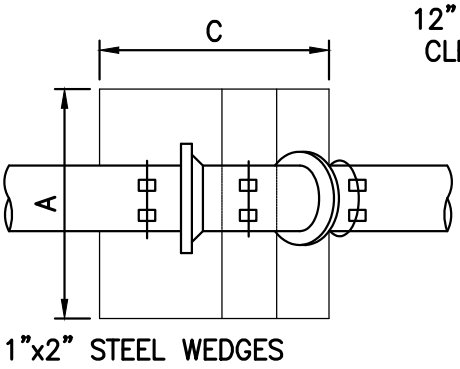


NOTES:

1. RETAINER GLANDS SHALL BE UTILIZED AT ALL JOINTS.
2. ALL VALVES, FITTINGS TO BE CLASS 350 D.I.M.J.
3. FIRE HYDRANT TO BE INSTALLED AT THE PROPERTY LINE BETWEEN LOTS.
4. HYDRANT TO BE PAINTED SAFETY YELLOW.
5. PROVIDE WARNING TAPE 12" MINIMUM BELOW GRADE ABOVE HYDRANT LEAD.
6. PROVIDE 8 GAUGE HDPE COATED COPPER TRACER WIRE.

TOWN OF DENTON DEPARTMENT OF PUBLIC WORKS		WATER MAIN DETAILS TYPICAL FIRE HYDRANT INSTALLATION	REVISED DEC 2007 APR 2021	SHEET W-5.00

G:\Projects\2020\200110 Town of Denton On-Call Services 2020-2025\Standards & Specs\Revised 2021 (GMB)\Manual\DETAILS\CAD\WATER.dwg May 27, 2021 - 10:02am



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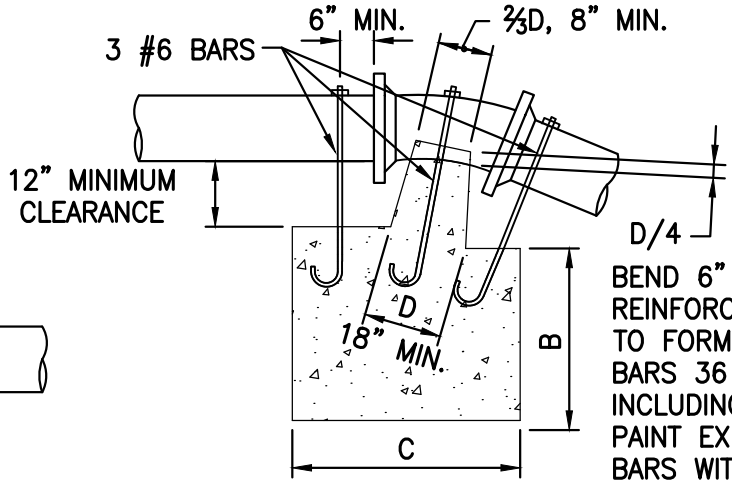


BEND 6" MINIMUM OF REINFORCING BAR END TO FORM HOOK. EMBED BARS 36 DIAMETERS INCLUDING THE HOOK. PAINT EXPOSED REINF. BARS WITH 2 COATS OF BITUMINOUS PAINT.

ELEVATION

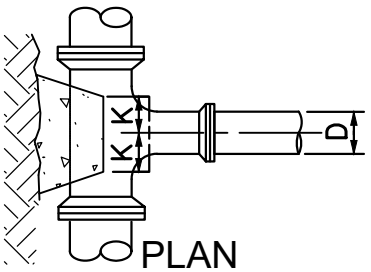
BUTTRESS DIMENSIONS							
BEND		3"	4"	6"	8"	10"	12"
ANCHORAGE 11 ¼° BEND	A	1'–6"	1'–6"	1'–6"	1'–6"	1'–5"	3'–0"
	B	1'–3"	1'–3"	1'–3"	1'–9"	1'–3"	2'–0"
	C	2'–0"	2'–0"	2'–0"	2'–6"	2'–9"	3'–0"
ANCHORAGE 22 ½° BEND	A	2'–0"	2'–0"	2'–0"	3'–4"	3'–8"	4'–0"
	B	1'–9"	1'–9"	1'–9"	2'–3"	2'–6"	2'–6"
	C	2'–6"	2'–6"	2'–6"	2'–8"	3'–10"	4'–0"
ANCHORAGE 45° BEND	A	2'–6"	2'–6"	2'–6"	3'–0"	4'–0"	4'–6"
	B	2'–6"	2'–6"	2'–6"	2'–9"	3'–0"	3'–6"
	C	3'–0"	3'–0"	3'–0"	4'–0"	4'–6"	4'–9"

NOTES:

1. ALL CONCRETE TO HAVE MINIMUM COMPRESSIVE STRENGTH OF 3,000 PSI.
2. BUTTRESS DIMENSIONS GIVEN ARE MINIMUM DIMENSIONS BASED UPON 3000 PSI SOIL BEARING CAPACITY AND 150 PSI INTERNAL PIPE PRESSURE.
3. ALL CONCRETE SHALL BE CARRIED TO UNDISTURBED EARTH.
4. PIPE JOINTS WITH KRAFT PAPER OR 4 MIL POLYETHYLENE PRIOR TO POURING OF CONCRETE.

TOWN OF DENTON DEPARTMENT OF PUBLIC WORKS		WATER MAIN DETAILS BUTTRESS FOR UPPER VERTICAL BENDS	REVISED DEC 2007	SHEET W–6.00

G:\Projects\2020\200110 Town of Denton On-Call Services 2020-2025\Standards & Specs\Revised 2021 (GMB)\Manual\DETAILS\CAD\WATER.dwg May 04, 2021 - 3:24pm



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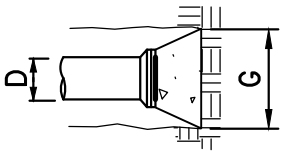

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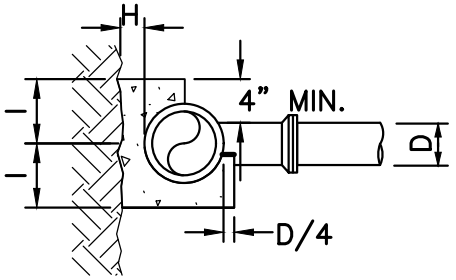
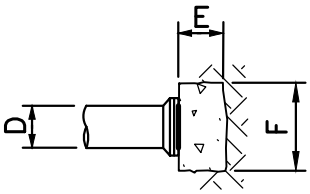


SECTION
TEES



SECTION
PLUGS & CAPS

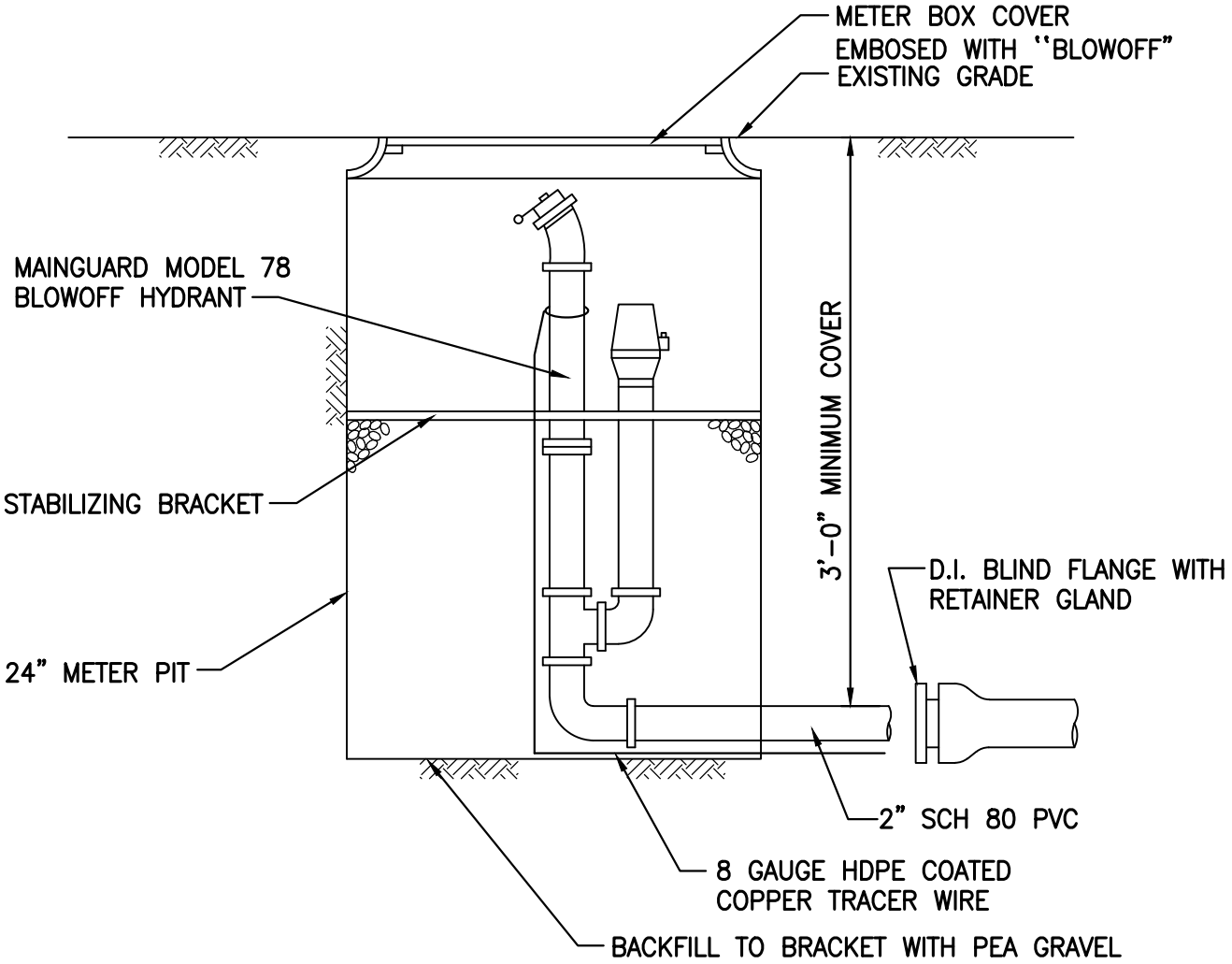
BUTTRESS DIMENSIONS						
D		4"	6"	8"	10"	12"
PLUGS & CAPS	E	0'–6"	0'–6"	0'–8"	0'–8"	0'–10"
	F	1'–0"	1'–0"	1'–4"	1'–8"	2'–0"
	G	1'–5"	1'–5"	1'–11"	2'–5"	2'–10"
TEES	H	0'–8"	0'–8"	0'–9"	0'–10"	1'–0"
	I	0'–8"	0'–8"	0'–10"	1'–0"	1'–3"
	J	0'–7"	0'–7"	0'–9"	1'–0"	1'–2"
	K	0'–6"	0'–6"	0'–8"	0'–8"	0'–8"

NOTES:

1. ALL CONCRETE TO HAVE MINIMUM COMPRESSIVE STRENGTH OF 3000 PSI.
2. BUTTRESS DIMENSIONS GIVEN ARE MINIMUM DIMENSIONS BASED UPON 3000 PSI SOIL BEARING CAPACITY AND 150 PSI INTERNAL PIPE PRESSURE.
3. ALL CONCRETE SHALL BE CARRIED TO UNDISTURBED EARTH.
4. WRAP PIPE JOINTS WITH KRAFT PAPER OR 4 MIL POLYETHYLENE SHEETING PRIOR TO POURING OF CONCRETE.

TOWN OF DENTON DEPARTMENT OF PUBLIC WORKS		WATER MAIN DETAILS BUTTRESS FOR TEES, PLUGS & CAPS	REVISED DEC 2007	SHEET W–6.10

G:\Projects\2020\200110 Town of Denton On-Call Services 2020-2025\Standards & Specs\Revised 2021 (GMB)\Manual\DETAILS\CAD\WATER.dwg May 04, 2021 - 3:24pm

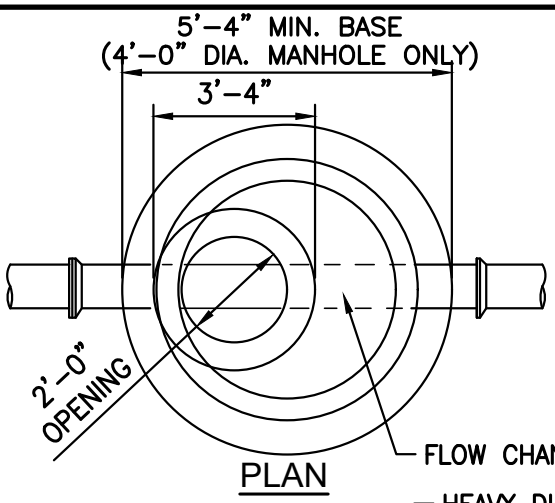


NOTES:

1. INSTALL WARNING TAPE.
2. LOCATE BLOWOFF ASSEMBLY AS DIRECTED BY ENGINEER.

TOWN OF DENTON DEPARTMENT OF PUBLIC WORKS		WATER MAIN DETAILS 2" BLOWOFF ASSEMBLY	REVISED DEC 2007 APR 2021	SHEET W-7.00

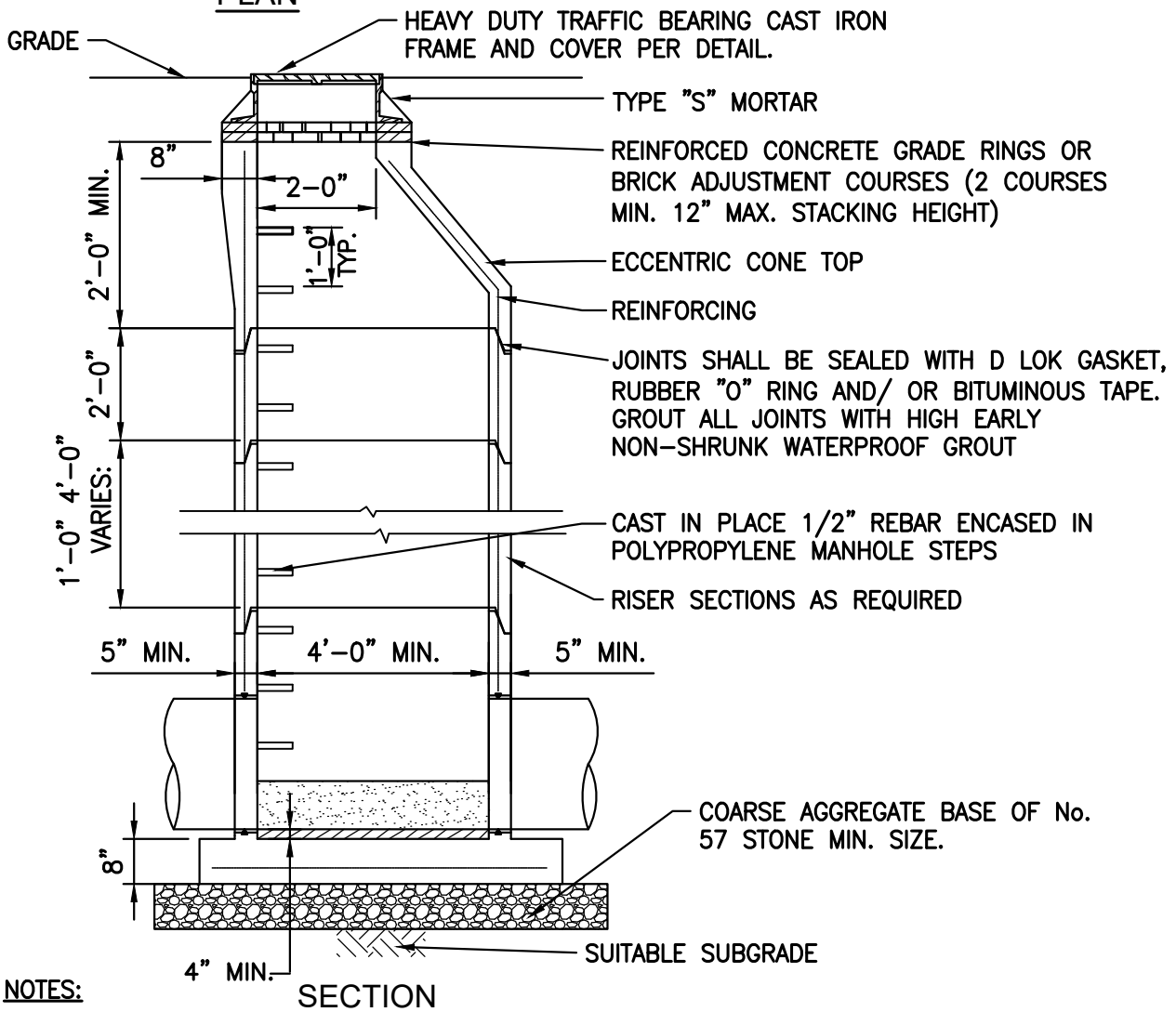
G:\Projects\2020\200110 Town of Denton On-Call Services 2020-2025\Standards & Specs\Revised 2021 (GMB)\Manual\DETAILS\CAD\WATER.dwg May 04, 2021 - 3:25pm



PLAN

NOTE:
ALL BRICK WORK FOR GRADE/LEVEL ADJUSTMENT SHALL USE TYPE "S" MORTAR AND BE CONSTRUCTED BY QUALIFIED MECHANICS.

ALL HDPE PIPE CONNECTIONS TO STRUCTURE SHALL BE MADE WITH WATER STOP GASKET AS MANUFACTURED BY ADS OR APPROVED EQUAL



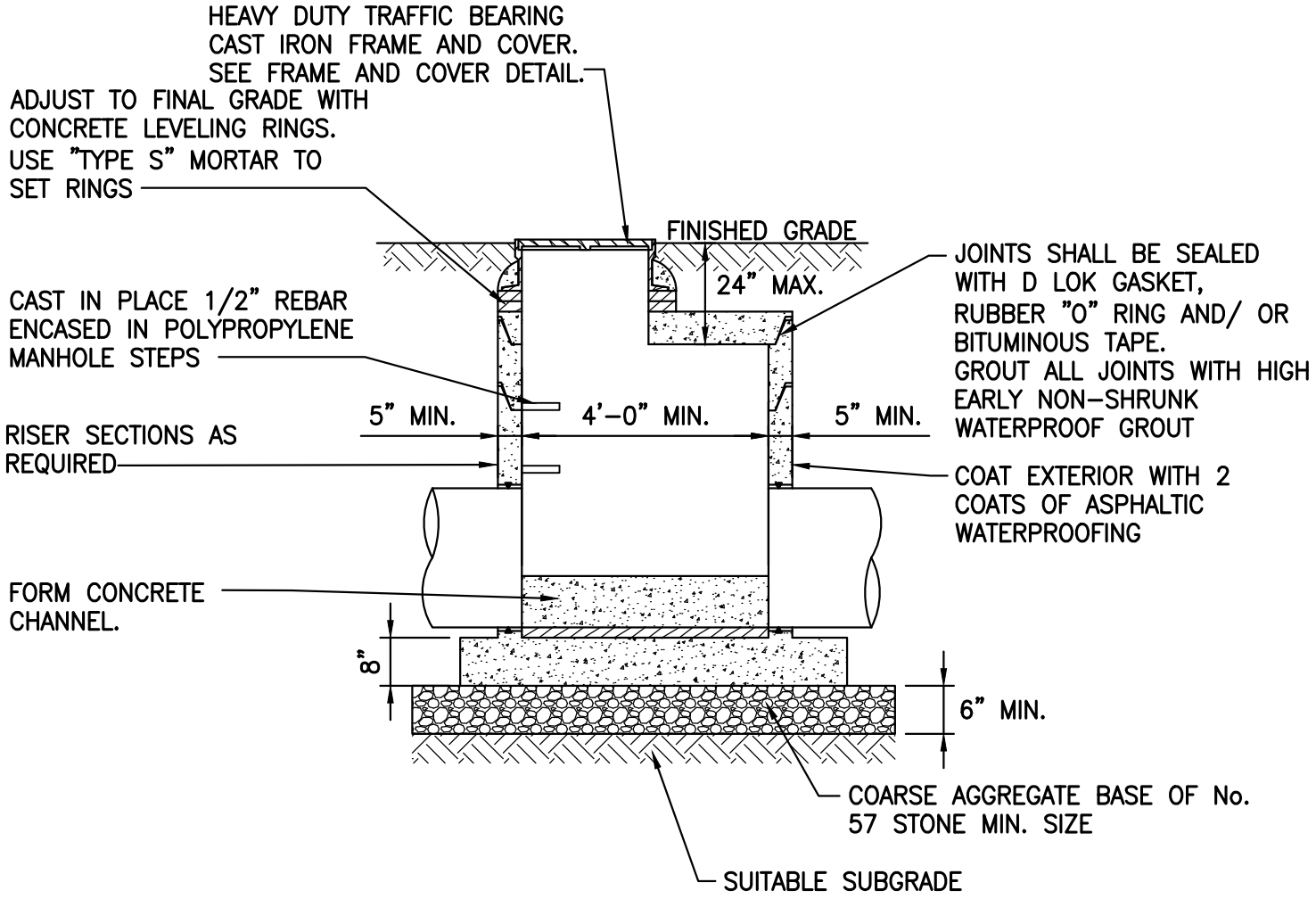
SECTION

NOTES:

1. MANHOLE SHALL CONFORM TO ASTM C-478, LATEST EDITION.
2. PARGE ALL JOINTS WITH TYPE "S" NON-SHRINK GROUT.
3. ALL BRICK WORK FOR GRADE/LEVEL ADJUSTMENT SHALL USE TYPE "S" MORTAR AND BE CONSTRUCTED BY QUALIFIED MECHANICS.
4. ALL HDPE PIPE CONNECTIONS TO STRUCTURE SHALL BE MADE WITH WATER STOP GASKET AS MANUFACTURED BY ADS OR APPROVED EQUAL.

TOWN OF DENTON DEPARTMENT OF PUBLIC WORKS	DENTON PUBLIC WORKS	STORM DRAIN DETAILS PRECAST CONCRETE MANHOLE	REVISED DEC 2007 APR 2021	SHEET SD-1.00

G:\Projects\2020\200110 Town of Denton On-Call Services 2020-2025\Standards & Specs\Revised 2021 (GMB)\Manual\DETAILS\CAD\STORM WATER.dwg May 04, 2021 - 3:25pm

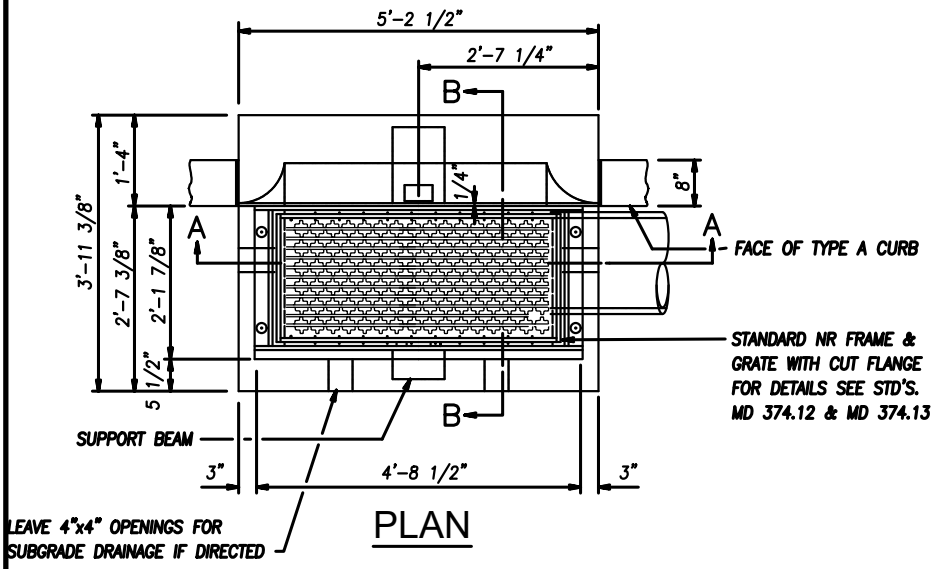


NOTES:

1. PRECAST MANHOLE SHALL CONFORM TO ASTM C-478 LATEST EDITION.
2. ALL MORTAR SHALL BE "TYPE S".
3. BENCH AND CHANNEL SHALL BE BRICK OR HAND FORMED CONCRETE. MINIMUM THICKNESS OF 4", BENCH SHALL SLOPE TO TOP OF PIPE 1/2" FALL PER FOOT.
4. ALL BRICK WORK FOR GRADE/LEVEL ADJUSTMENT SHALL BE CONSTRUCTED BY QUALIFIED MECHANICS.
5. ALL HDPE PIPE CONNECTIONS TO STRUCTURE SHALL BE MADE WITH A WATER STOP GASKET AS MANUFACTURED BY ADS, OR APPROVED EQUAL.

TOWN OF DENTON DEPARTMENT OF PUBLIC WORKS		STORM DRAIN DETAILS SHALLOW PRECAST MANHOLE	REVISED DEC 2007 APR 2021	SHEET SD-1.10

G:\Projects\2020\200110 Town of Denton On-Call Services 2020-2025\Standards & Specs\Revised 2021 (GMB)\Manual\DETAILS\CAD\STORM WATER.dwg May 04, 2021 - 3:25pm



PLAN

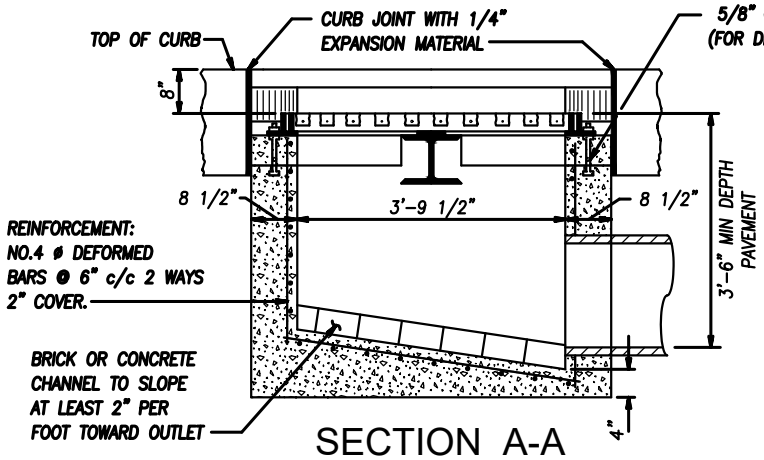
NOTE:

1. INLET SHALL BE CONSTRUCTED OF REINFORCED CONCRETE MIX NO. SIZE, TYPE & DIRECTION OF INLET CONNECTION WILL VARY TO SUIT CONDITIONS. SEE S.H.A. SPECIFICATIONS FOR INLETS. REINFORCEMENT REQUIRED ON OUTSIDE, AS WELL AS ON INSIDE, OF WALLS BELOW 7'-0" WHEN "A" IS GREATER THAN 7'-0". SPACING, SAME AS FOR INSIDE OF WALL. PLACE 1/4" EXPANSION MATERIAL OF SAME TYPE APPROVED FOR PAVEMENT BETWEEN THE FRAME & ABUTTING RIGID PAVEMENT, & BETWEEN ENDS OF INLET CURB & NORMAL CURB. BRICK FOR MASONRY TO COMPLY WITH THE S.H.A. SPECIFICATIONS. FOR UNDEPRESSED INLETS, USE NORMAL PAVEMENT SLOPE. IF LADDER RUNGS ARE REQUIRED SEE STD. NO. MD 383.91 OR MD 383.92.

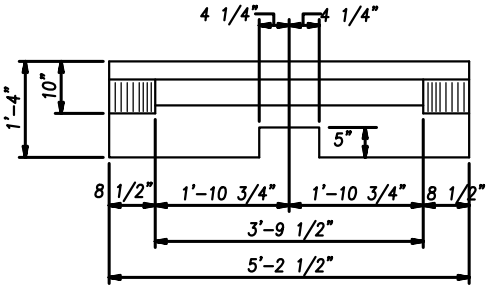
2. ALL BRICK WORK FOR GRADE/LEVEL ADJUSTMENT SHALL USE TYPE "S" MORTAR AND BE CONSTRUCTED BY QUALIFIED MECHANICS.

3. PARGE ALL JOINTS WITH BITMASTIC TAPE, GROUT SEAMS WITH TYPE "S" NON-SHRINK GROUT.

4. ALL HDPE PIPE CONNECTIONS TO STRUCTURE SHALL BE MADE WITH WATER STOP GASKET AS MANUFACTURED BY ADS OR APPROVED EQUAL.

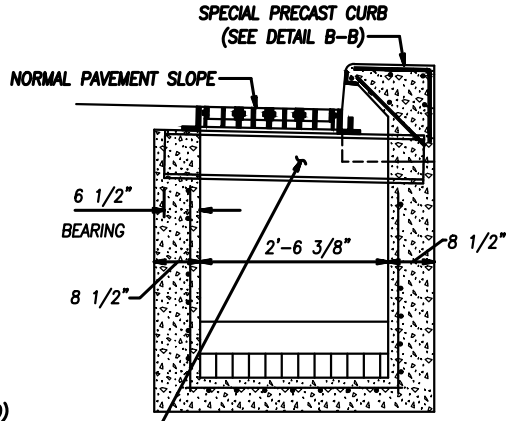


SECTION A-A



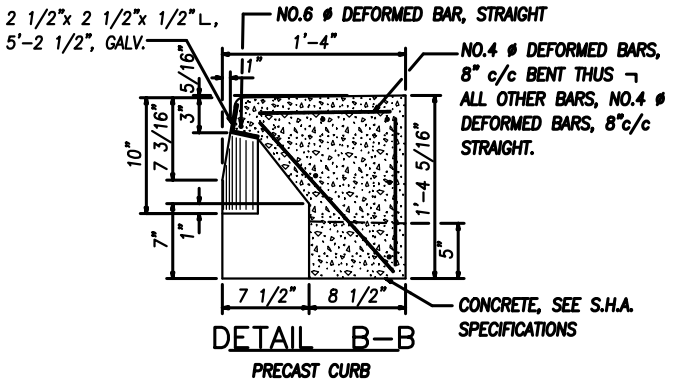
FRONT ELEVATION

PRECAST CURB



SECTION B-B

W8x31 (GALVANIZED) SUPPORT BEAM 3'-7 3/8" LONG FOR DETAILS SEE STD. MD 374.13 FOR METHOD OF ANCHORING SUPPORT BEAM INLET IF CONSTRUCTED OF BRICK SEE STD. MD 374.15 (FOR INLET REPAIR ONLY)

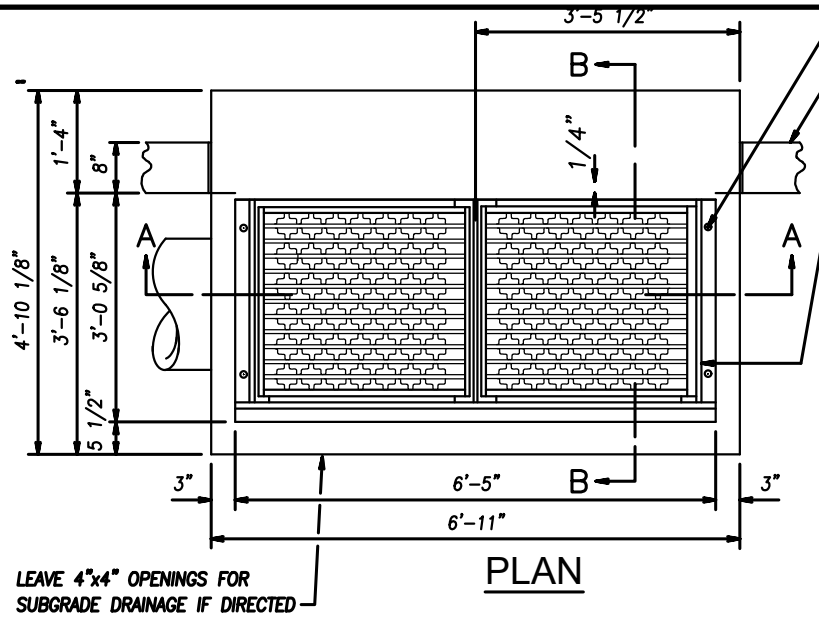


DETAIL B-B

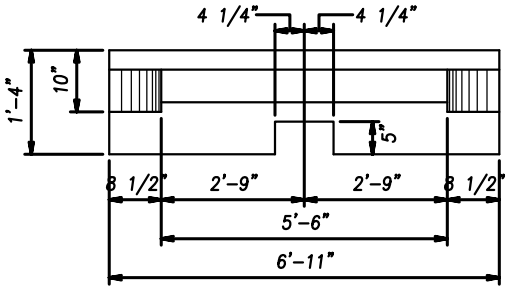
PRECAST CURB

TOWN OF DENTON DEPARTMENT OF PUBLIC WORKS	STORM DRAIN DETAILS STANDARD "NR" INLET	REVISED DEC 2007 APR 2021	SHEET SD-2.00

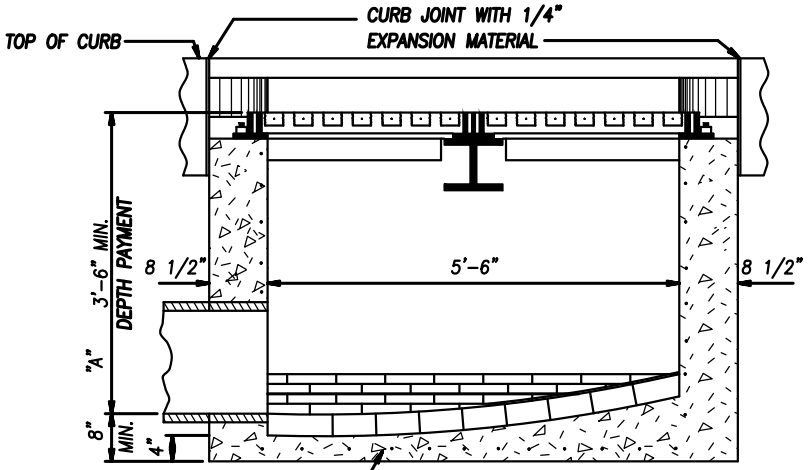
G:\Projects\2020\200110 Town of Denton On-Call Services 2020-2025\Standards & Specs\Revised 2021 (GMB)\Manual\DETAILS\CAD\STORM WATER.dwg May 04, 2021 - 3:25pm



PLAN

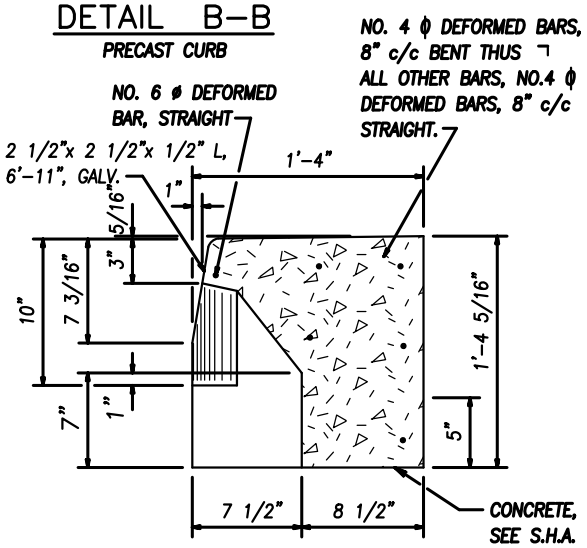


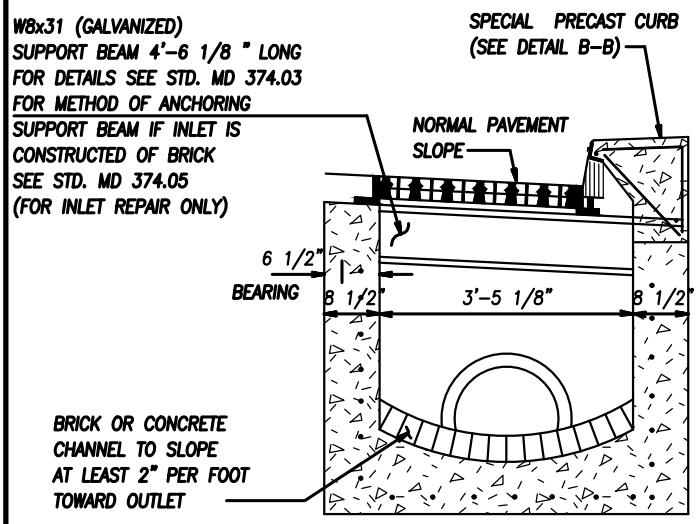
FRONT ELEVATION
PRECAST CURB



SECTION A-A

DETAIL B-B
PRECAST CURB





SECTION B-B

NOTE:

1. INLET SHALL BE CONSTRUCTED OF REINFORCED CONCRETE MIX NO. SIZE, TYPE & DIRECTION OF INLET CONNECTION WILL VARY TO SUIT CONDITIONS. SEE S.H.A. SPECIFICATIONS FOR INLETS. REINFORCEMENT REQUIRED ON OUTSIDE, AS WELL AS ON INSIDE, OF WALLS BELOW 7'-0" WHEN "A" IS GREATER THAN 7'-0". SPACING, SAME AS FOR INSIDE OF WALL. PLACE 1/4" EXPANSION MATERIAL OF SAME TYPE APPROVED FOR PAVEMENT BETWEEN THE FRAME & ABUTTING RIGID PAVEMENT, & BETWEEN ENDS OF INLET CURB & NORMAL CURB. BRICK FOR MASONRY TO COMPLY WITH THE S.H.A. SPECIFICATIONS. FOR UNDEPRESSED INLETS, USE NORMAL PAVEMENT SLOPE. IF LADDER RUNGS ARE REQUIRED SEE STD. NO. MD 383.91 OR MD 383.92.

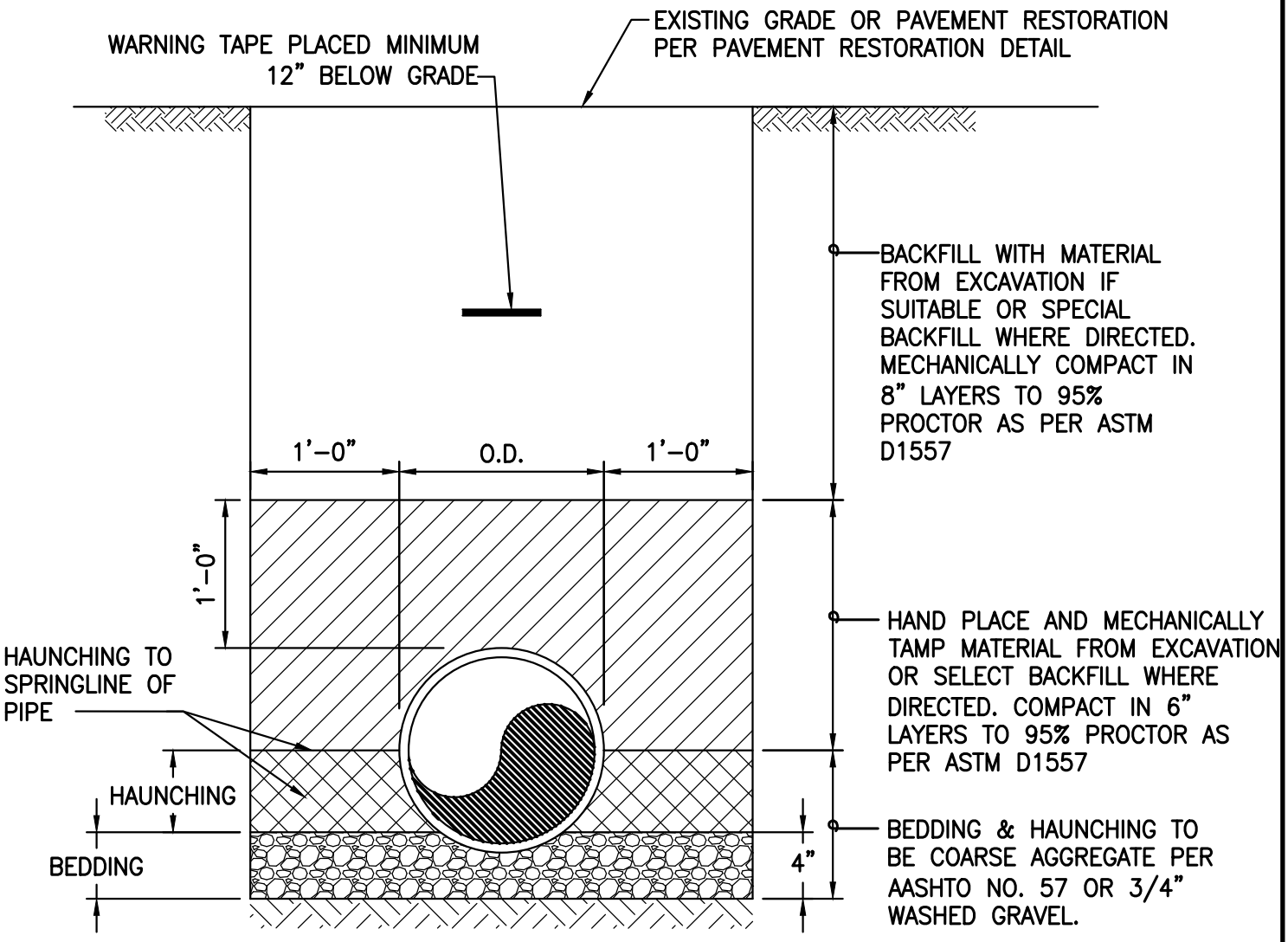
2. ALL BRICK WORK FOR GRADE/LEVEL ADJUSTMENT SHALL USE TYPE "S" MORTAR AND BE CONSTRUCTED BY QUALIFIED MECHANICS.

3. PARGE ALL JOINTS WITH BITMASTIC TAPE, GROUT SEAMS WITH TYPE "S" NON-SHRINK GROUT.

4. ALL HDPE PIPE CONNECTIONS TO STRUCTURE SHALL BE MADE WITH WATER STOP GASKET AS MANUFACTURED BY ADS OR APPROVED EQUAL.

TOWN OF DENTON DEPARTMENT OF PUBLIC WORKS	DENTON PUBLIC WORKS	STORM DRAIN DETAILS STANDARD "WR" INLET	REVISED DEC 2007 APR 2021	SHEET SD-2.10

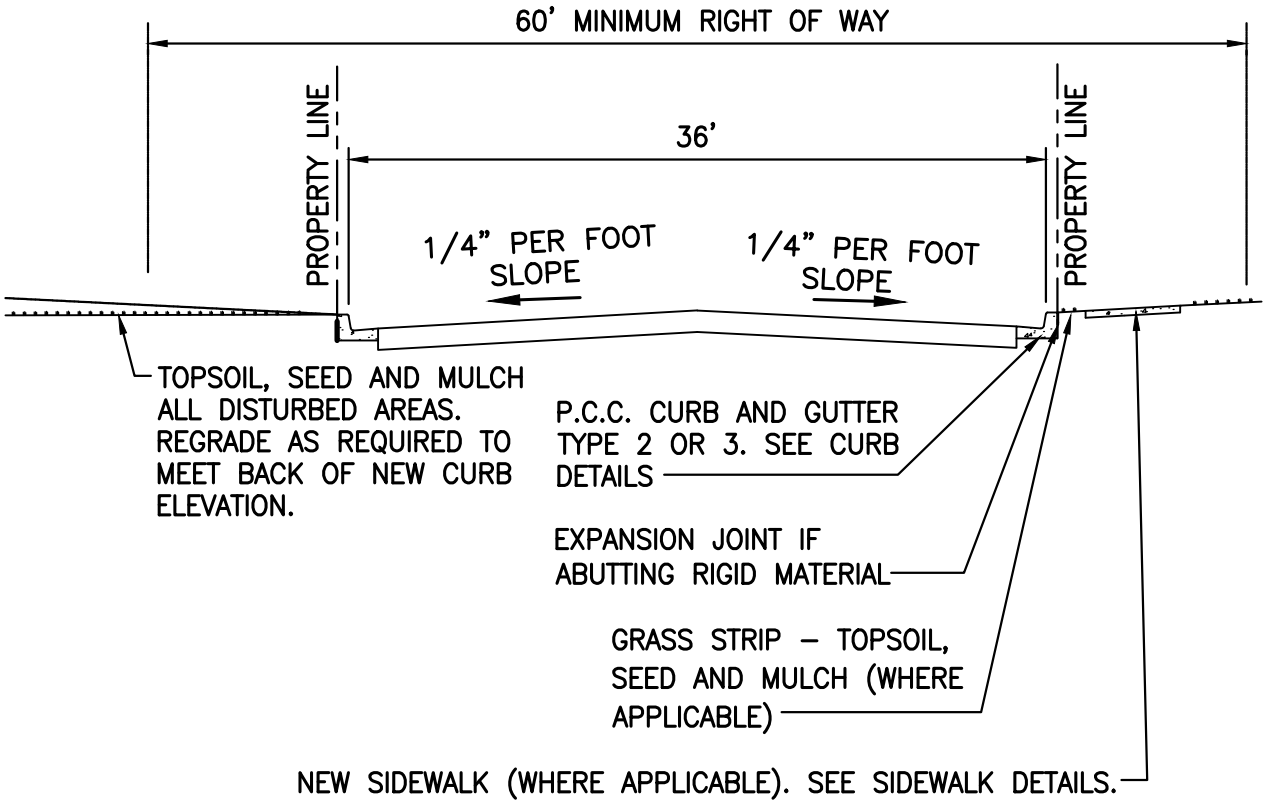
G:\Projects\2020\200110 Town of Denton On-Call Services 2020-2025\Standards & Specs\Revised 2021 (GMB)\Manual\DETAILS\CAD\STORM WATER.dwg May 04, 2021 - 3:25pm



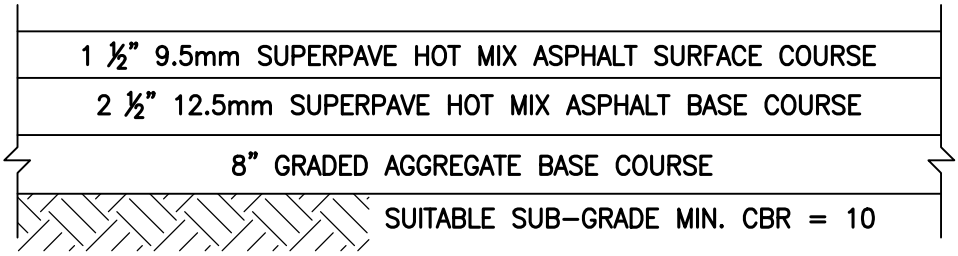
PIPE BEDDING AND BACKFILL DETAIL

TOWN OF DENTON DEPARTMENT OF PUBLIC WORKS	DENTON PUBLIC WORKS	STORM DRAIN DETAILS PIPE BEDDING & BACKFILL	REVISED DEC 2007 APR 2021	SHEET SD-3.00

G:\Projects\2020\200110 Town of Denton On-Call Services 2020-2025\Standards & Specs\Revised 2021 (GMB)\Manual\DETAILS\CAD\STORM WATER.dwg May 04, 2021 - 3:25pm



RIGHT OF WAY SECTION



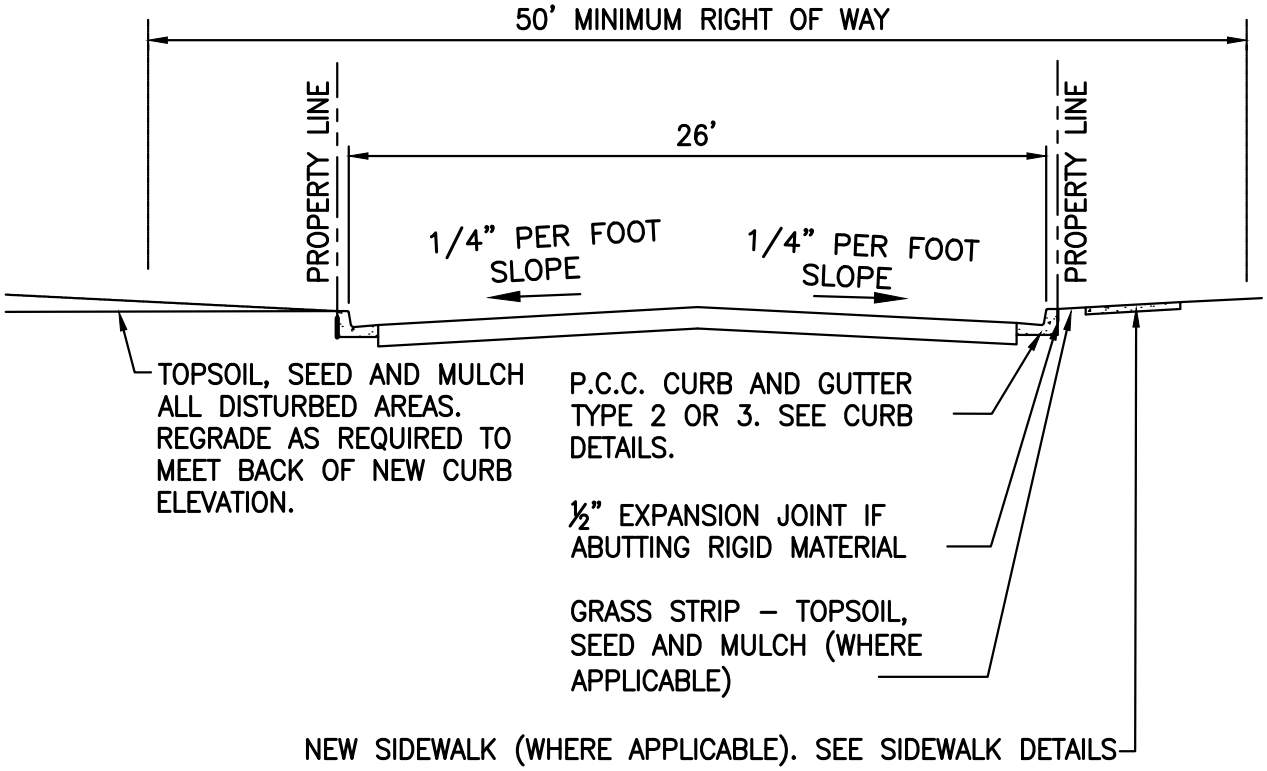
PAVING SECTION

NOTES:

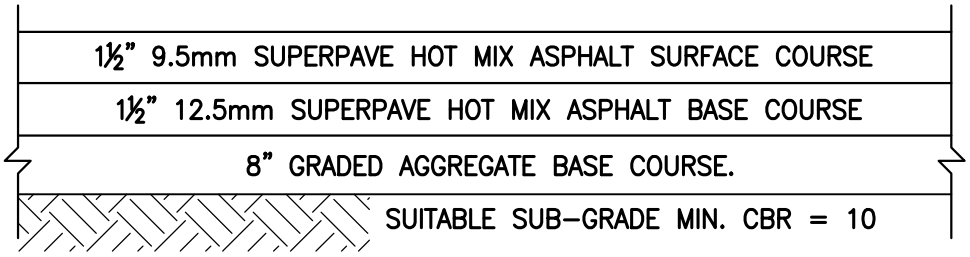
1. BASE & SUB-BASE COURSES TO BE COMPACTED TO MIN. 95% MODIFIED PROCTOR PER ASTM D-1557.
2. SOIL STABILIZATION (SOIL CEMENT), GEOTEXTILES / FABRICS FOR BASE STABILIZATION MAY BE CONSIDERED ONLY AFTER SPECIFIC APPROVAL FROM TOWN OF DENTON DPW.
3. PAVEMENT THICKNESS PER PAVEMENT DESIGN AS APPLICABLE.

TOWN OF DENTON DEPARTMENT OF PUBLIC WORKS	DENTON PUBLIC WORKS	PAVEMENT & CONCRETE DETAILS COLLECTOR STREETS RESIDENTIAL AREAS	REVISED DEC 2007 APR 2021	SHEET PW-1.00

G:\Projects\2020\200110 Town of Denton On-Call Services 2020-2025\Standards & Specs\Revised 2021 (GMB)\Manual\DETAILS\CAD\PAVEMENT & CONCRETE.dwg May 04, 2021 - 3:25pm



RIGHT OF WAY SECTION



PAVING SECTION

NOTES:

1. BASE & SUB-BASE COURSES TO BE COMPACTED TO MIN. 95% MODIFIED PROCTOR PER ASTM D-1557.
2. SOIL STABILIZATION (SOIL CEMENT), GEOTEXTILES / FABRICS FOR BASE STABILIZATION MAY BE CONSIDERED ONLY AFTER SPECIFIC APPROVAL FROM TOWN OF DENTON DPW.
3. PAVEMENT THICKNESS PER PAVEMENT DESIGN AS APPLICABLE.

TOWN OF DENTON DEPARTMENT OF PUBLIC WORKS	PAVEMENT & CONCRETE DETAILS MINOR STREETS IN SINGLE FAMILY RESIDENTIAL AREAS	REVISED DEC 2007 APR 2021	SHEET PW-1.10

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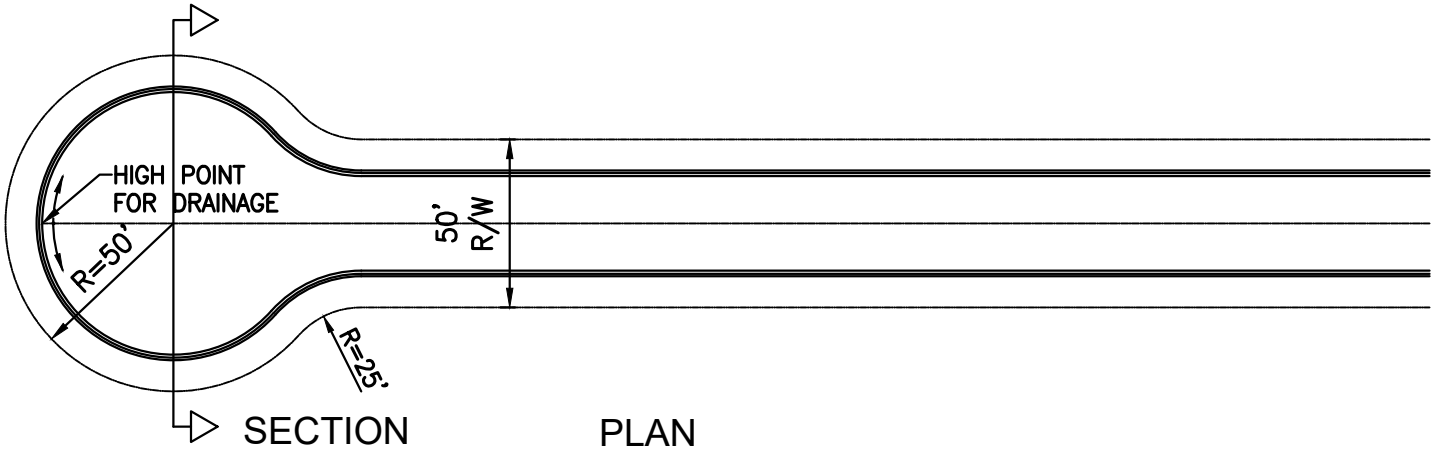
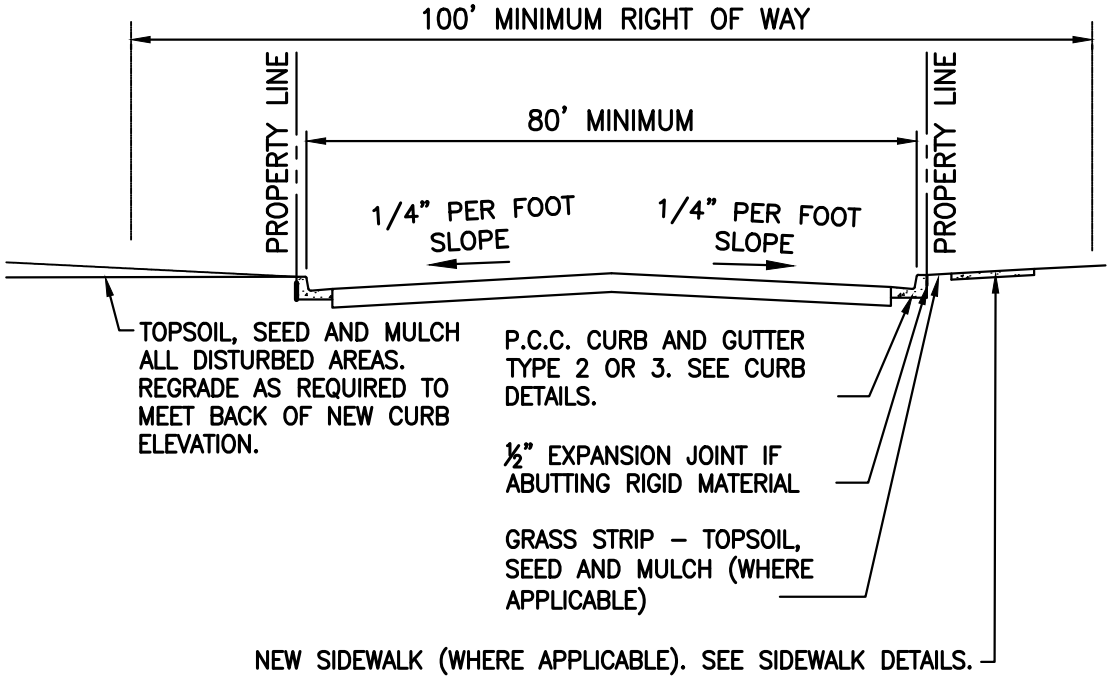
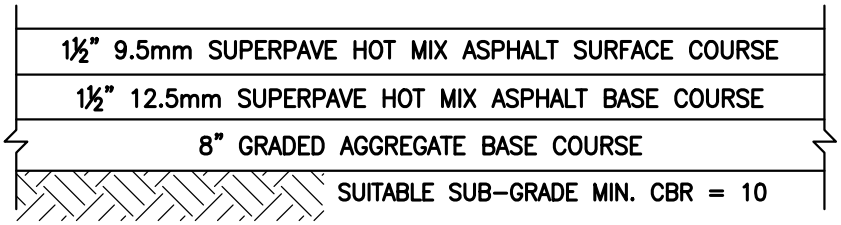




NOTE:
MAXIMUM LENGTH OF CUL-DE-SAC STREET: 600 FEET, AS MEASURED ALONG CENTERLINE STATIONING

RIGHT OF WAY SECTION



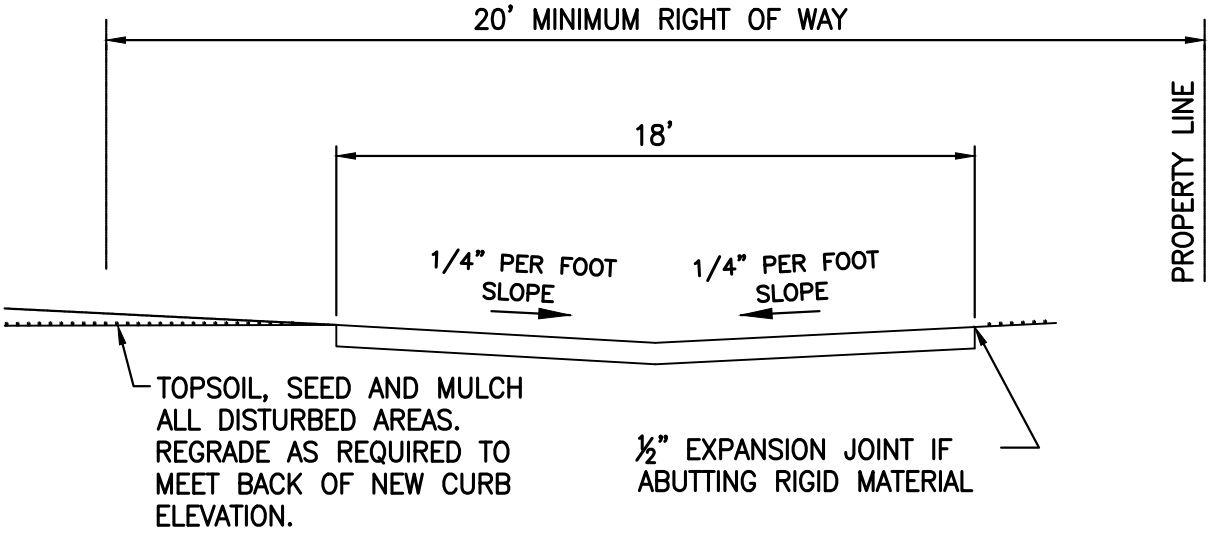
PAVING SECTION

NOTES:

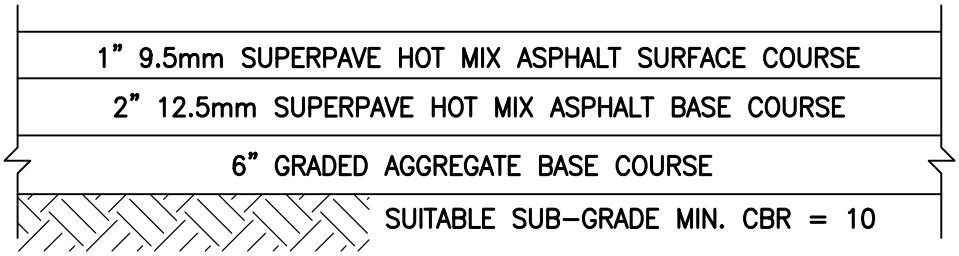
1. BASE & SUB-BASE COURSES TO BE COMPACTED TO MIN. 95% MODIFIED PROCTOR PER ASTM D-1557.
2. SOIL STABILIZATION (SOIL CEMENT), GEOTEXTILES / FABRICS FOR BASE STABILIZATION MAY BE CONSIDERED ONLY AFTER SPECIFIC APPROVAL FROM TOWN OF DENTON DPW.
3. PAVEMENT THICKNESS PER PAVEMENT DESIGN, AS APPLICABLE.

TOWN OF DENTON DEPARTMENT OF PUBLIC WORKS	DENTON PUBLIC WORKS	PAVEMENT & CONCRETE DETAILS CUL-DE-SAC IN SINGLE FAMILY RESIDENTIAL AREAS	REVISED DEC 2007 APR 2021	SHEET PW-1.20

G:\Projects\2020\200110 Town of Denton On-Call Services 2020-2025\Standards & Specs\Revised 2021 (GMB)\Manual\DETAILS\CAD\PAVEMENT & CONCRETE.dwg May 04, 2021 - 3:25pm



RIGHT OF WAY SECTION



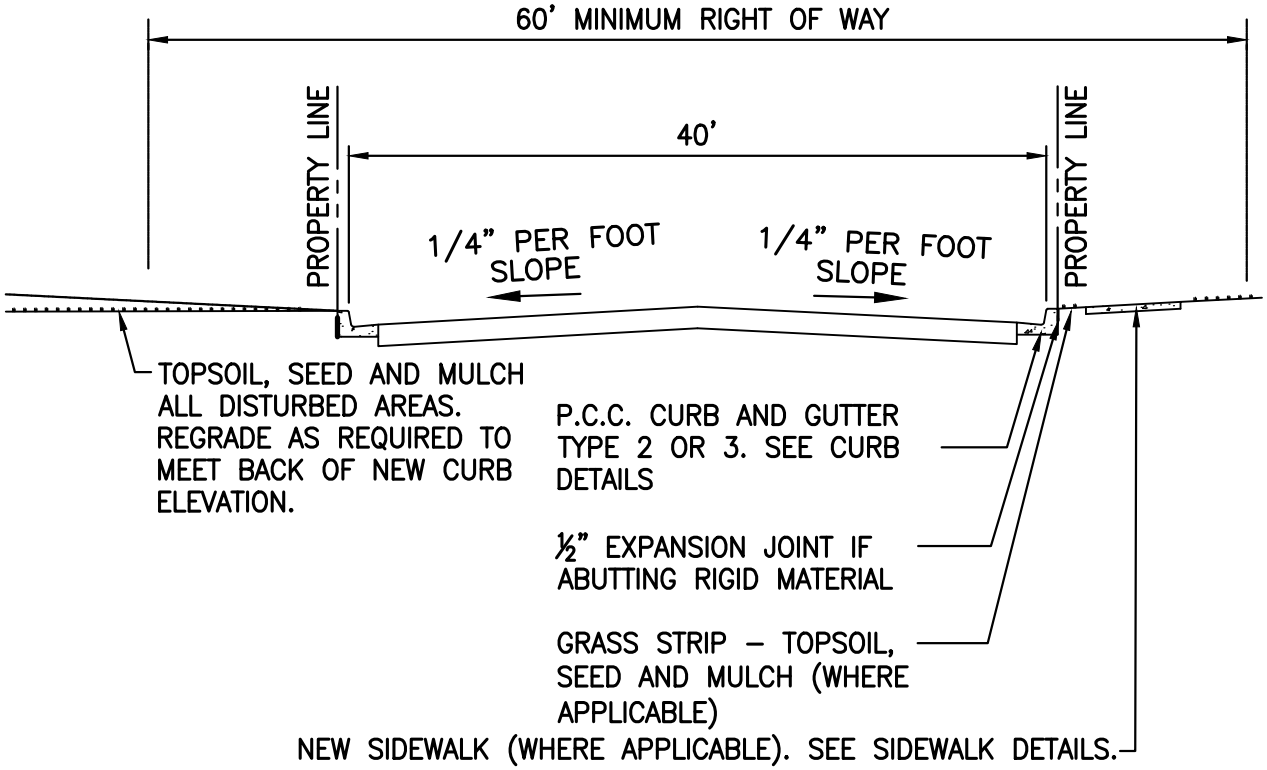
PAVING SECTION

NOTES:

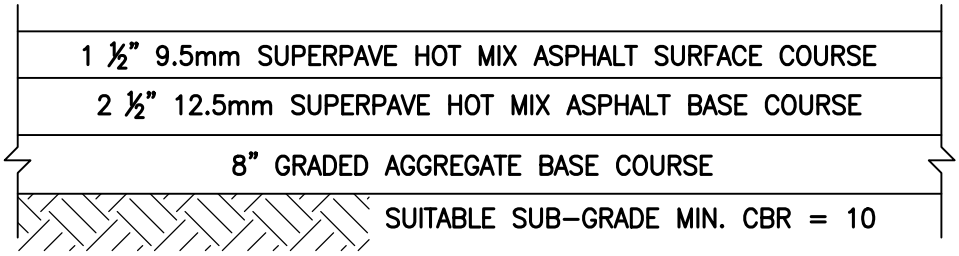
1. BASE & SUB-BASE COURSES TO BE COMPACTED TO MIN. 95% MODIFIED PROCTOR PER ASTM D-1557.
2. SOIL STABILIZATION (SOIL CEMENT), GEOTEXTILES / FABRICS FOR BASE STABILIZATION MAY BE CONSIDERED ONLY AFTER SPECIFIC APPROVAL FROM TOWN OF DENTON DPW.
3. PAVEMENT THICKNESS PER PAVEMENT DESIGN AS APPLICABLE.

TOWN OF DENTON DEPARTMENT OF PUBLIC WORKS	DENTON PUBLIC WORKS	PAVEMENT & CONCRETE DETAILS RESIDENTIAL ALLEY	REVISED DEC 2007 APR 2021	SHEET PW-1.30

G:\Projects\2020\200110 Town of Denton On-Call Services 2020-2025\Standards & Specs\Revised 2021 (GMB)\Manual\DETAILS\CAD\PAVEMENT & CONCRETE.dwg May 04, 2021 - 3:25pm



RIGHT OF WAY SECTION



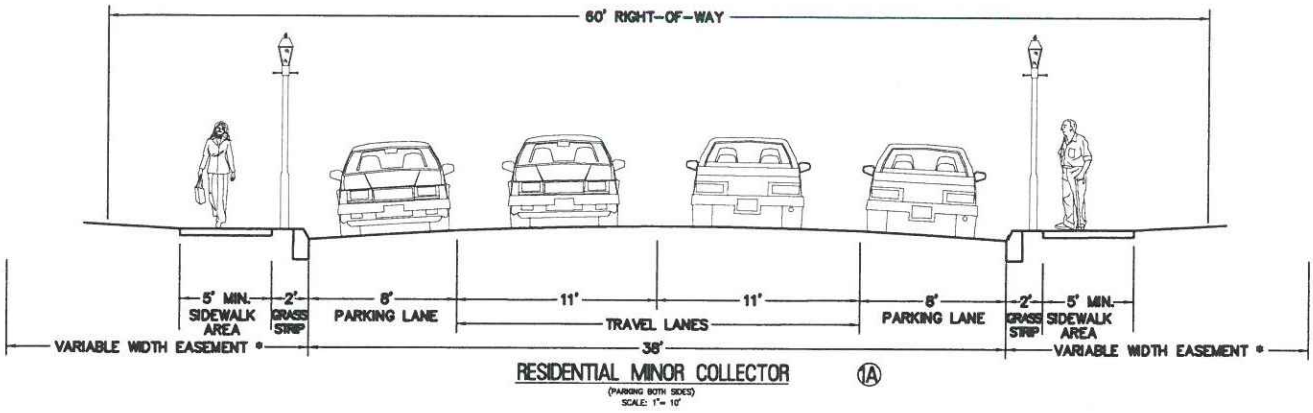
PAVING SECTION

NOTES:

1. BASE & SUB-BASE COURSES TO BE COMPACTED TO MIN. 95% MODIFIED PROCTOR PER ASTM D-1557.
2. SOIL STABILIZATION (SOIL CEMENT), GEOTEXTILES / FABRICS FOR BASE STABILIZATION MAY BE CONSIDERED ONLY AFTER SPECIFIC APPROVAL FROM TOWN OF DENTON DPW.
3. PAVEMENT THICKNESS PER PAVEMENT DESIGN AS APPLICABLE.

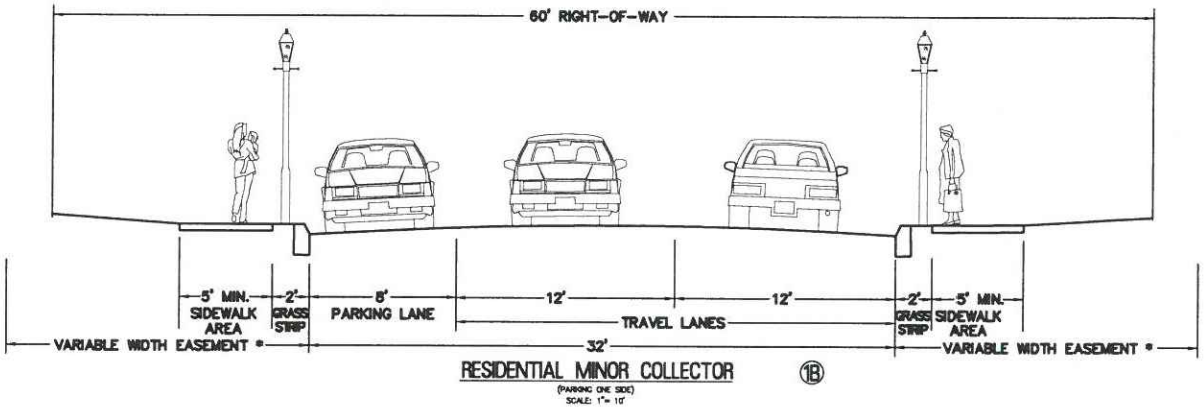
TOWN OF DENTON DEPARTMENT OF PUBLIC WORKS		PAVEMENT & CONCRETE DETAILS COLLECTOR STREETS COMMERCIAL & INDUSTRIAL AREAS	REVISED DEC 2007 APR 2021	SHEET PW-1.40

G:\Projects\2020\200110 Town of Denton On-Call Services 2020-2025\Standards & Specs\Revised 2021 (GMB)\Manual\DETAILS\CAD\PAVEMENT & CONCRETE.dwg May 04, 2021 - 3:25pm



RESIDENTIAL MINOR COLLECTOR (1A)

(PARKING BOTH SIDES)
SCALE: 1"= 10'



RESIDENTIAL MINOR COLLECTOR (1B)

(PARKING ONE SIDE)
SCALE: 1"= 10'

COMMERCIAL/INDUSTRIAL MINOR COLLECTOR (2)

SCALE: 1"= 10'

TOWN OF DENTON DEPARTMENT OF PUBLIC WORKS		DENTON PUBLIC WORKS	PAVEMENT & CONCRETE DETAILS STANDARD ROAD CROSS-SECTION DETAILS 1 OF 2	REVISED DEC 2007 APR 2021	SHEET PW-1.50

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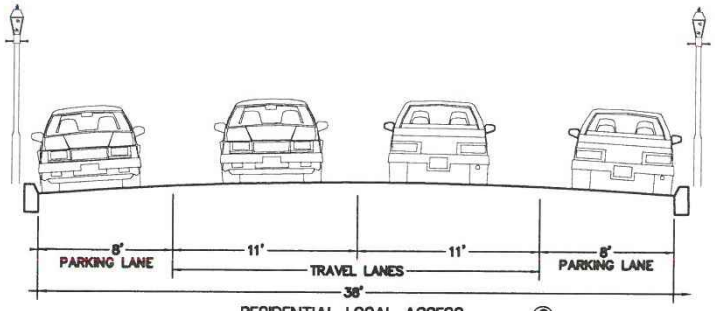
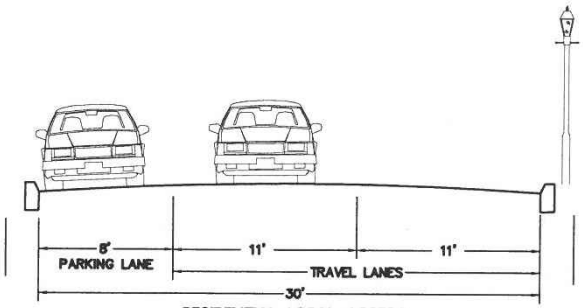


RESIDENTIAL LOCAL ACCESS ③

(PARKING BOTH SIDES)

SCALE: 1"= 10'



RESIDENTIAL LOCAL ACCESS

(PARKING ONE SIDE)

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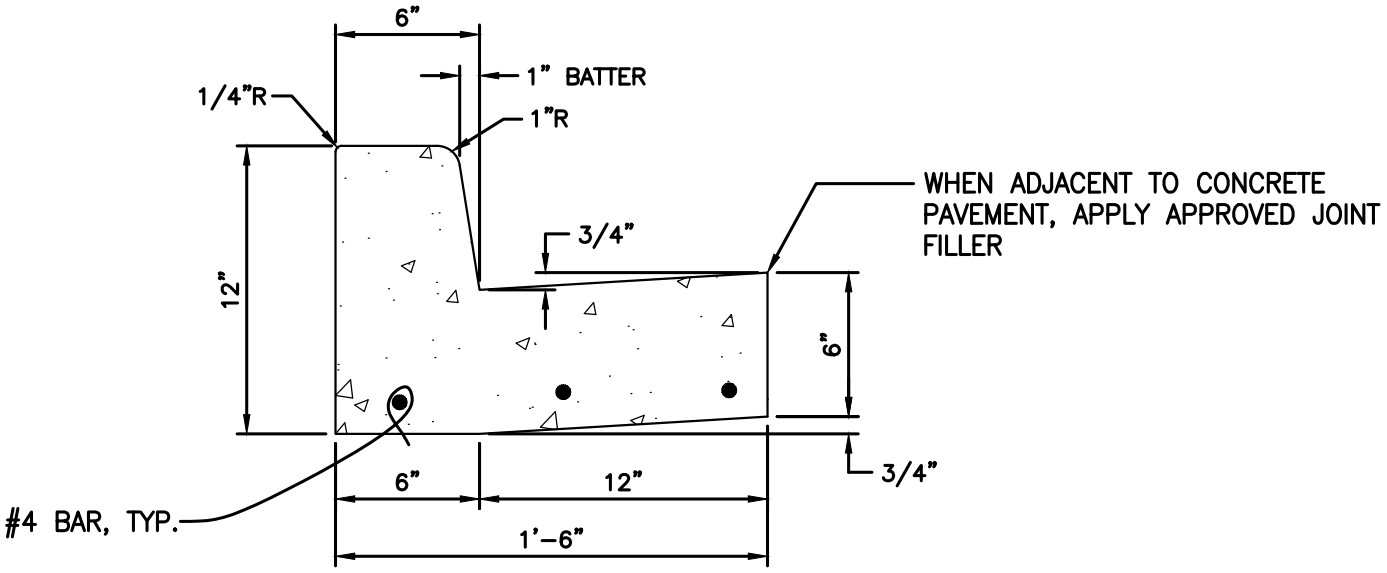
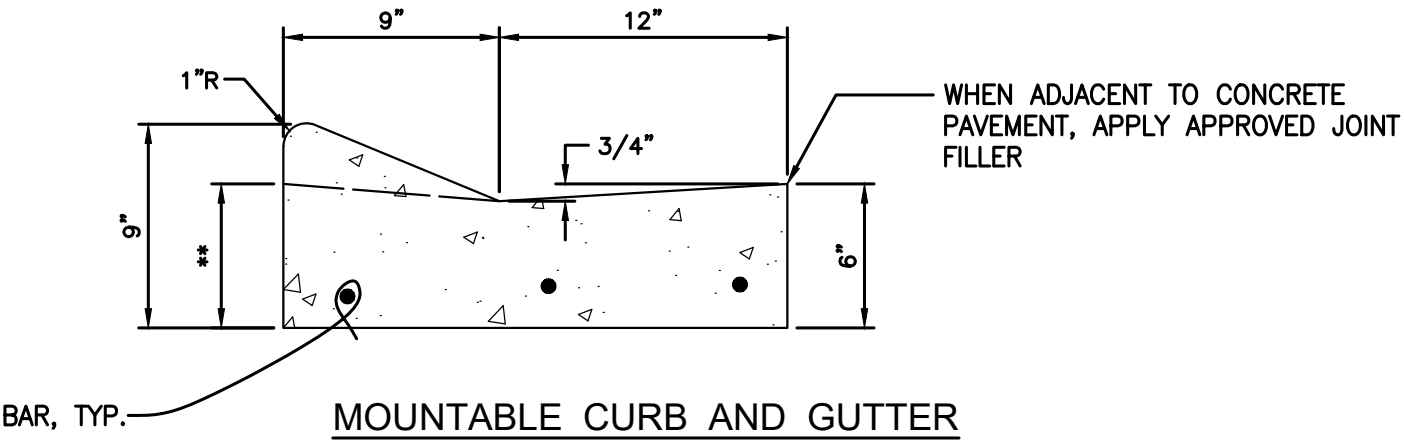
TOWN OF DENTON DEPARTMENT OF PUBLIC WORKS		PAVEMENT & CONCRETE DETAILS STANDARD ROAD CROSS-SECTION DETAILS 2 OF 2	REVISED DEC 2007 APR 2021	SHEET PW-1.60



STANDARD CURB AND GUTTER



MOUNTABLE CURB AND GUTTER

NOTES:

1. CURBING SHALL BE INSTALLED ON MINIMUM 8" GRADED AGGREGATE BASE ON SUITABLE SUBGRADE COMPACTED TO MINIMUM 95% MODIFIED PROCTOR PER ASTM D-1557.

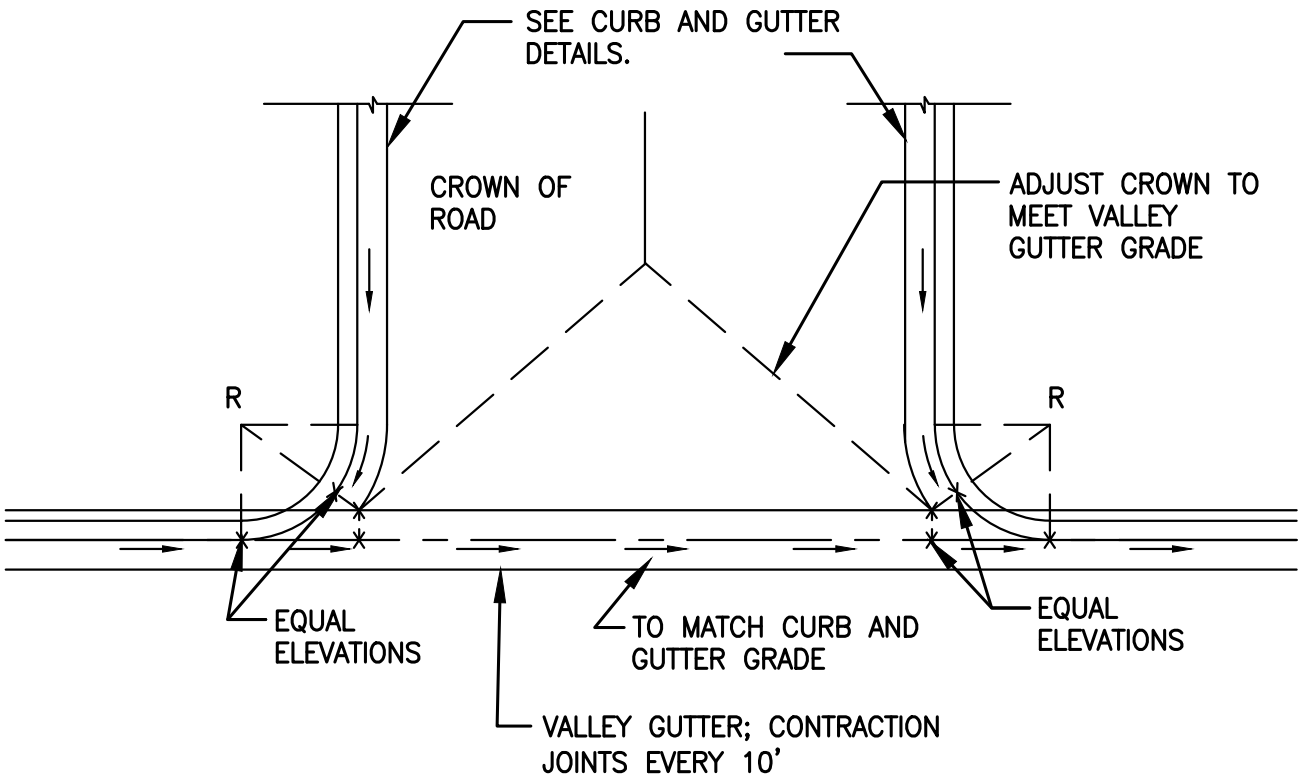
2. ALL CONCRETE USED FOR CURB AND GUTTER SHALL BE 3000 PSI.

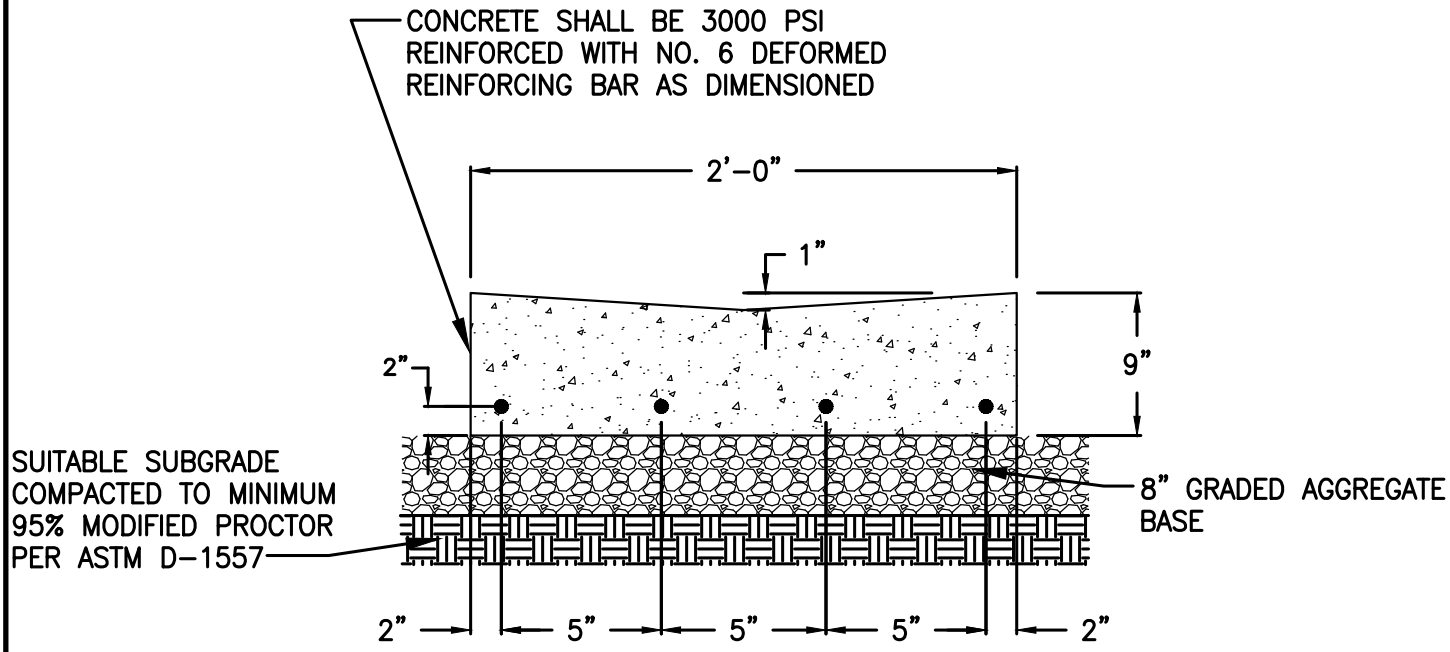
3. CURB AND GUTTER SHALL HAVE CONTRACTION JOINTS EVERY 10'-0" AND EXPANSION JOINTS EVERY 40'-0". EXTRUDED CONCRETE CURB AND GUTTER SHALL HAVE CONTRACTION JOINTS EVERY 10'-0", AND EXPANSION JOINTS EVERY 100'-0".

** 4. CURB HEIGHT SHALL BE 6" AT HANDICAP RAMPS.

TOWN OF DENTON DEPARTMENT OF PUBLIC WORKS	DENTON PUBLIC WORKS	PAVEMENT & CONCRETE DETAILS COMBINATION CONCRETE CURB & GUTTER	REVISED DEC 2007 NOV. 2009 APR 2021	SHEET PW-2.00

G:\Projects\2020\200110 Town of Denton On-Call Services 2020-2025\Standards & Specs\Revised 2021 (GMB)\Manual\DETAILS\CAD\PAVEMENT & CONCRETE.dwg May 04, 2021 - 3:26pm

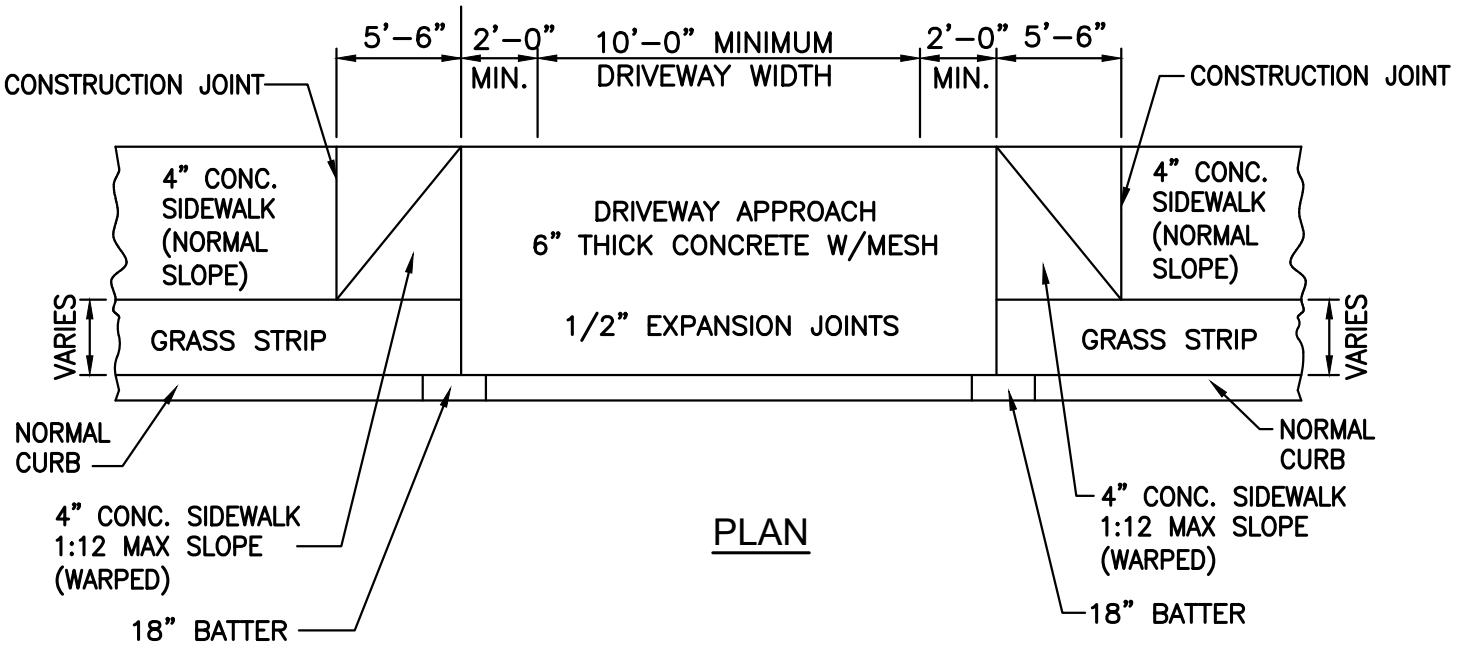




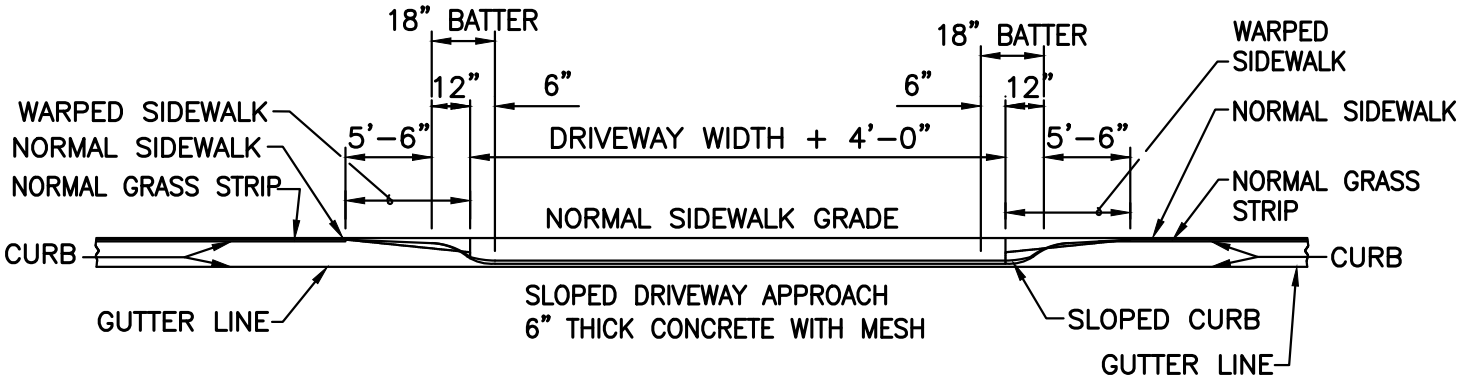
VALLEY GUTTER

TOWN OF DENTON DEPARTMENT OF PUBLIC WORKS		PAVEMENT & CONCRETE DETAILS VALLEY GUTTER AND INTERSECTION DETAIL	REVISED DEC 2007 APR 2021	SHEET PW-3.00

G:\Projects\2020\200110 Town of Denton On-Call Services 2020-2025\Standards & Specs\Revised 2021 (GMB)\Manual\DETAILS\CAD\PAVEMENT & CONCRETE.dwg May 04, 2021 - 3:26pm



PLAN



FRONT VIEW

NOTES:

1. ALL SIDEWALK AND DRIVEWAY ENTRANCES SHALL MEET A.D.A. REQUIREMENTS.
2. REFER TO TYPICAL SIDEWALKS DETAILS.

TOWN OF DENTON DEPARTMENT OF PUBLIC WORKS		PAVEMENT & CONCRETE DETAILS TYPICAL DRIVEWAY ENTRANCE WITH GRASS STRIP	REVISED DEC 2007	SHEET PW–4.00

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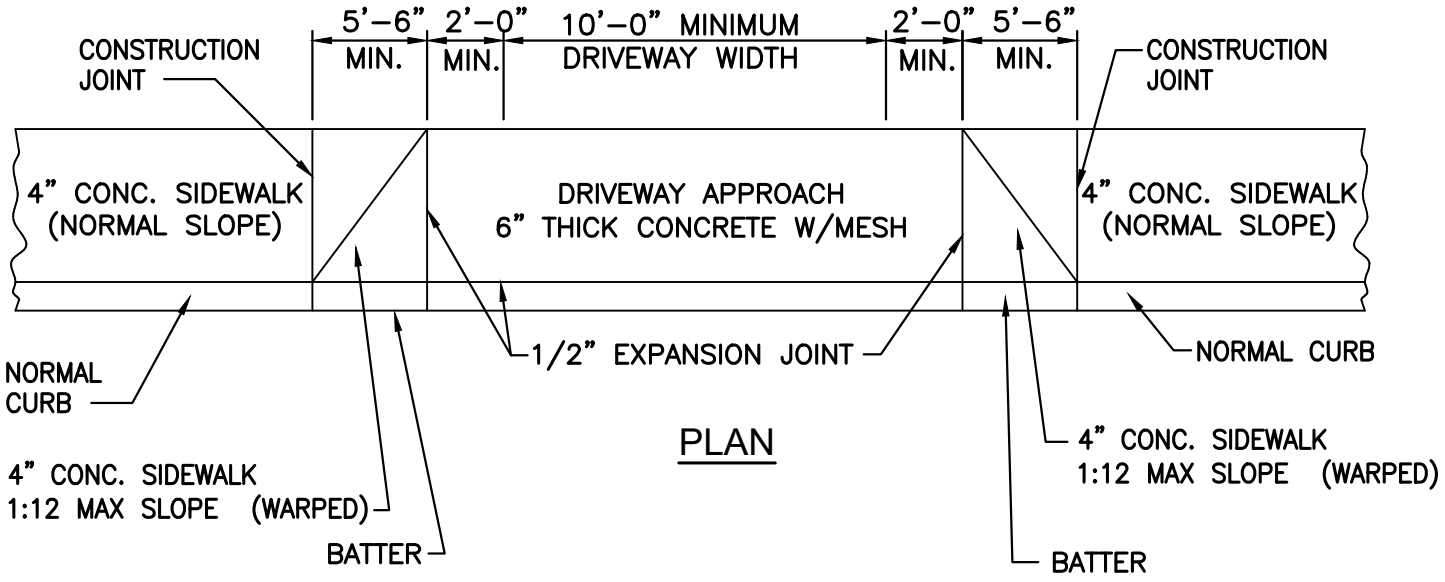
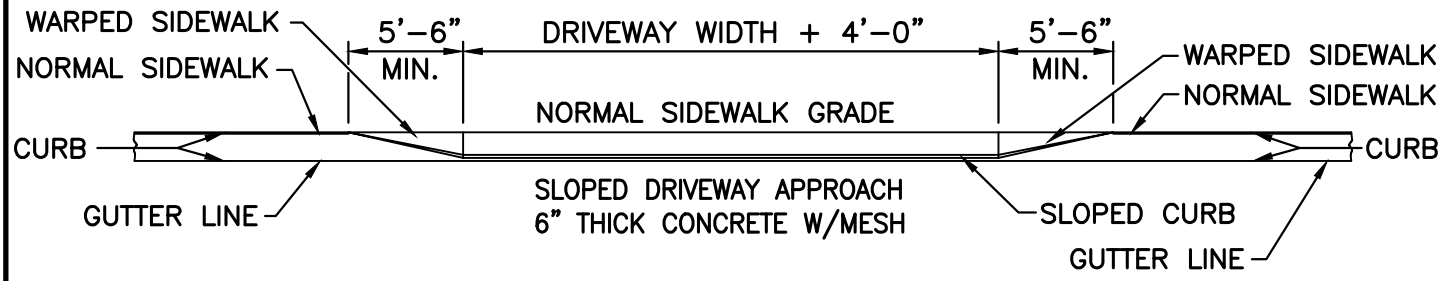


PLAN



FRONT VIEW

NOTES:

1. ALL SIDEWALK AND DRIVEWAY ENTRANCES SHALL MEET A.D.A. REQUIREMENTS.
2. REFER TO TYPICAL SIDEWALK DETAIL.

TOWN OF DENTON DEPARTMENT OF PUBLIC WORKS	PAVEMENT & CONCRETE DETAILS TYPICAL DRIVEWAY ENTRANCE WITHOUT GRASS STRIP	REVISED DEC 2007	SHEET PW–4.10

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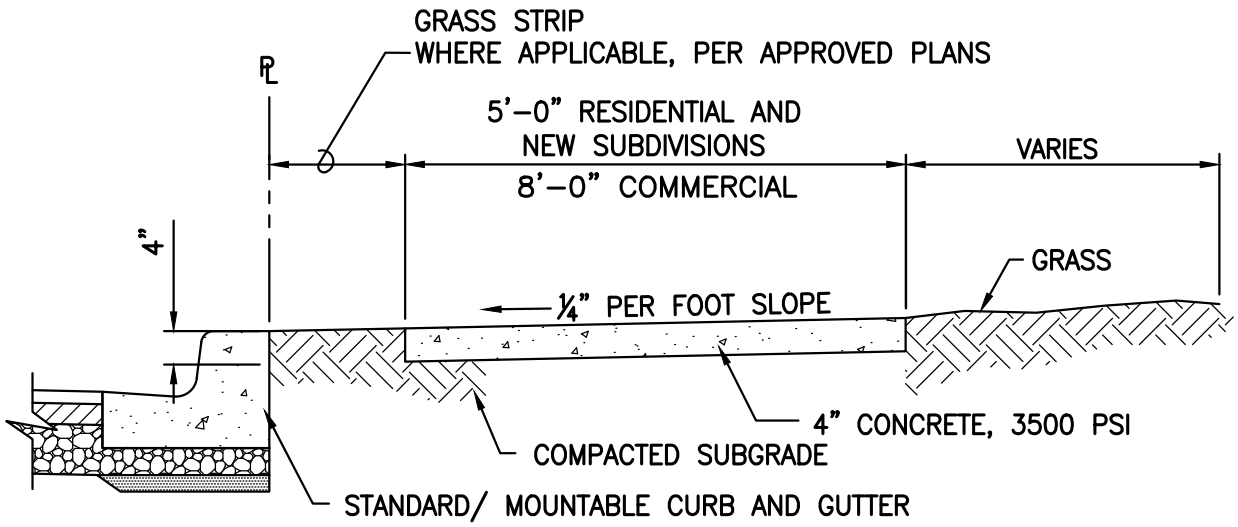
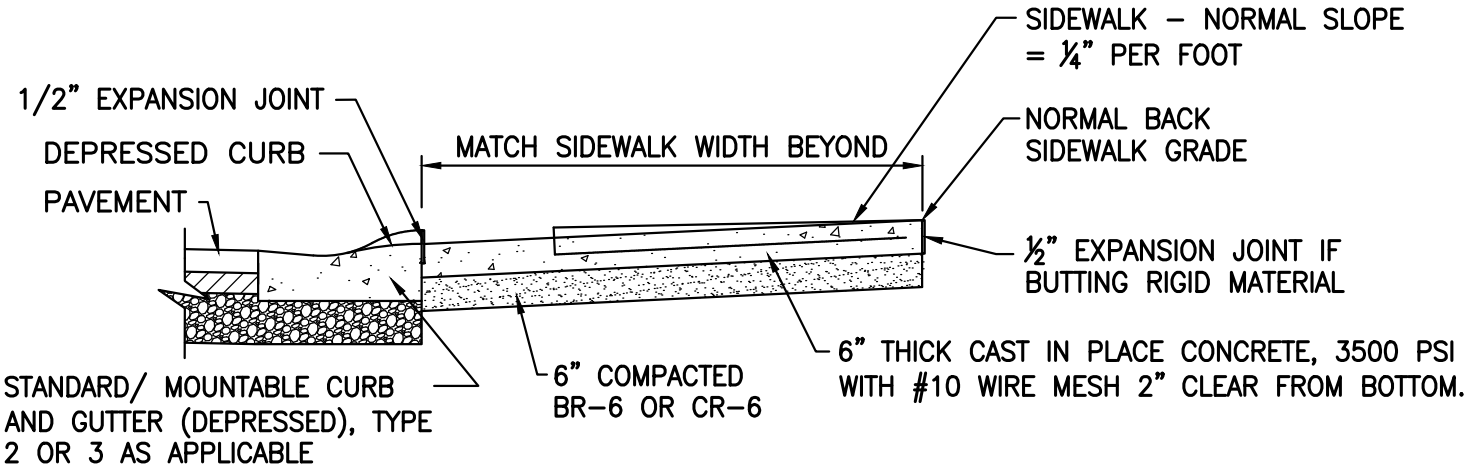


TYPICAL SIDEWALK INSTALLATION



TYPICAL SIDEWALK AT DRIVEWAY ENTRANCE

NOTES:

1. CONSTRUCT 1/2" EXPANSION JOINT WHERE CONCRETE ABUTS RIGID PAVEMENT, CURB AND/OR WALL.

2. TOPSOIL, SEED AND MULCH ALL DISTURBED AREAS. REGRADE AS REQUIRED TO MEET BACK OF CURB ELEVATION.

TOWN OF DENTON DEPARTMENT OF PUBLIC WORKS	DENTON PUBLIC WORKS	PAVEMENT & CONCRTE DETAILS TYPICAL SIDEWALKS	REVISED DEC 2007 APR 2021	SHEET PW–5.00

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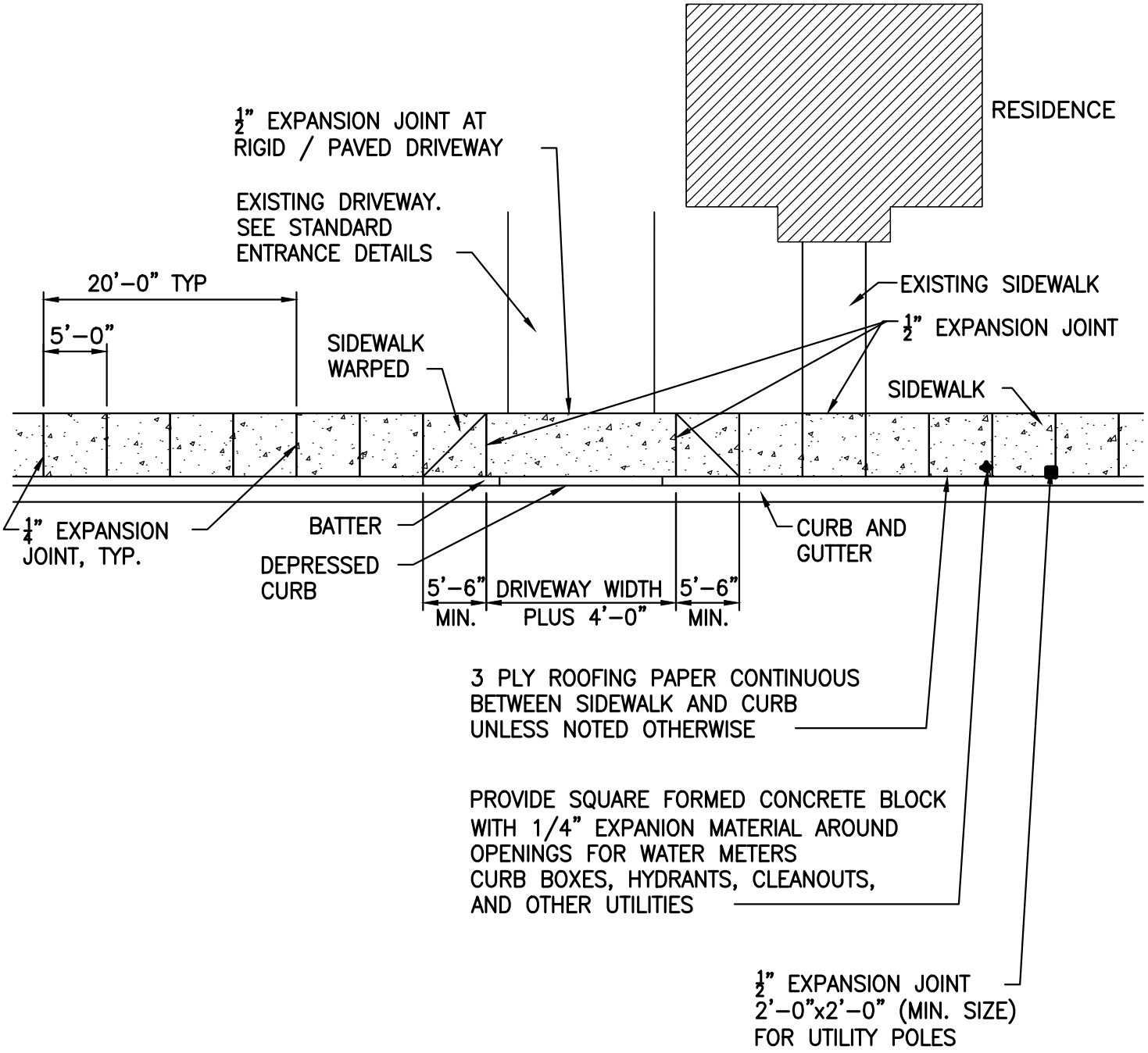

NOTES:

1. CONCRETE SHALL BE 3500 PSI
2. CONTRACTION JOINTS AT 5' INTERVALS
3. ¼" THICK, FULL DEPTH EXPANSION JOINTS AT INTERVALS NOT GREATER THAN 20'
4. REFER TO OTHER SIDEWALK AND DRIVEWAY STANDARD DETAILS

TOWN OF DENTON DEPARTMENT OF PUBLIC WORKS	DENTON PUBLIC WORKS	PAVEMENT & CONCRTE DETAILS TYPICAL CURB, GUTTER & SIDEWALK EXPANSION JOINTS	REVISED DEC 2007	SHEET PW–5.10

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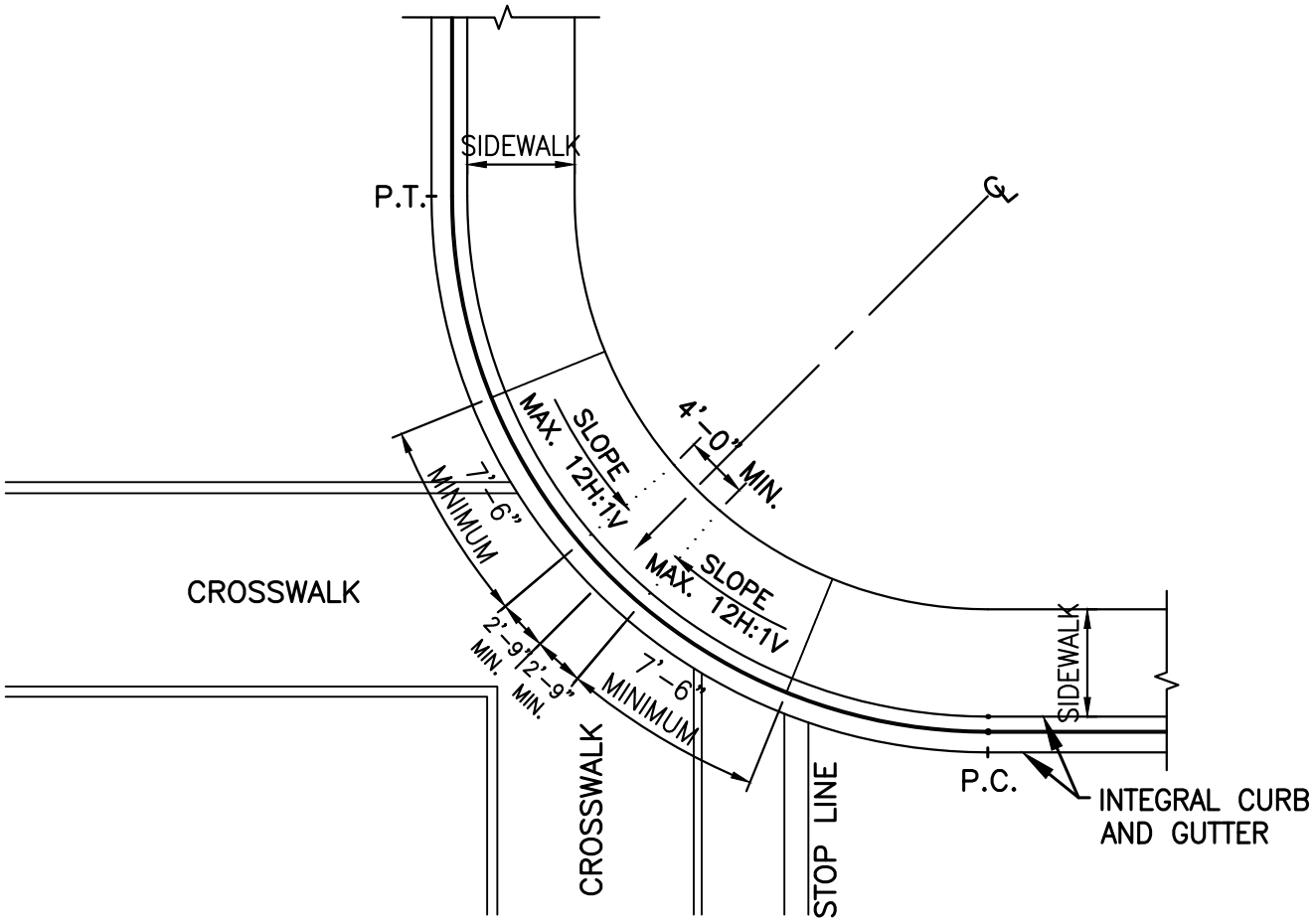

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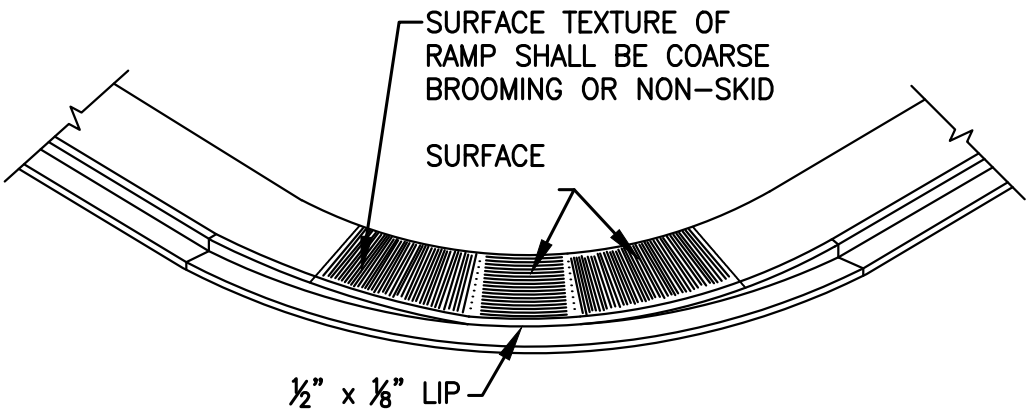

ISOMETRIC

NOTES:

1. ALL HANDICAP RAMPS SHALL BE A.D.A. COMPLIANT.
2. NO SLOPE SHALL EXCEED 12H:1V ON THE RAMP OR SIDEWALK.

TOWN OF DENTON DEPARTMENT OF PUBLIC WORKS		PAVEMENT & CONCRTE DETAILS HANDICAP RAMP	REVISED DEC 2007	SHEET PW-6.00

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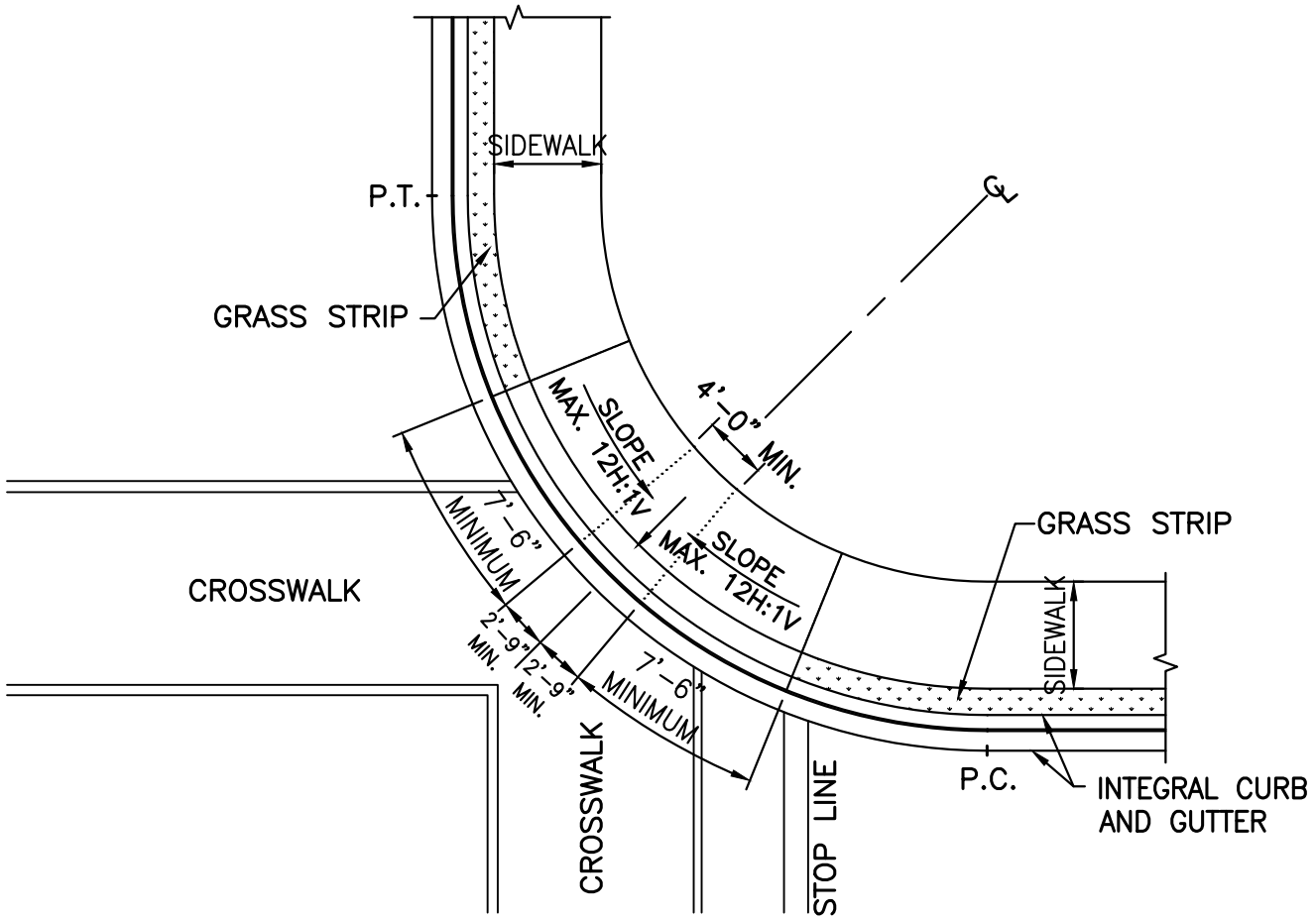

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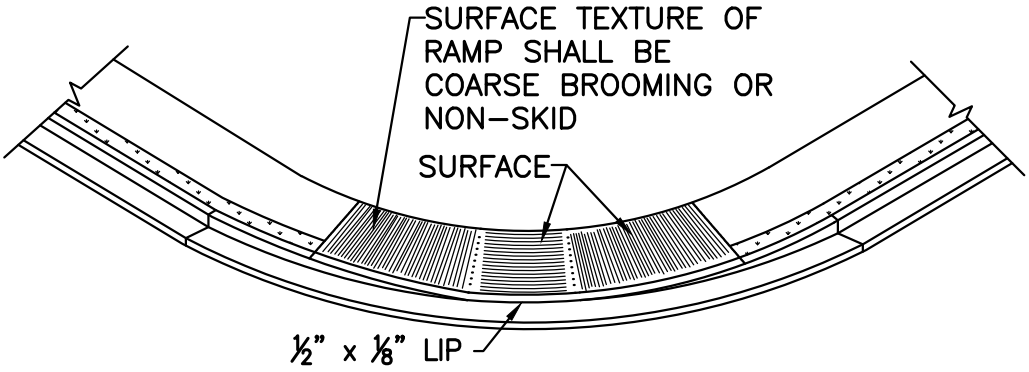

ISOMETRIC

NOTES:

1. ALL HANDICAP RAMPS SHALL BE A.D.A. COMPLIANT.
2. NO SLOPE SHALL EXCEED 12H:1V ON THE RAMP OR SIDEWALK.

TOWN OF DENTON DEPARTMENT OF PUBLIC WORKS		PAVEMENT & CONCRTE DETAILS HANDICAP RAMP WITH GRASS STRIP	REVISED DEC 2007	SHEET PW-6.10

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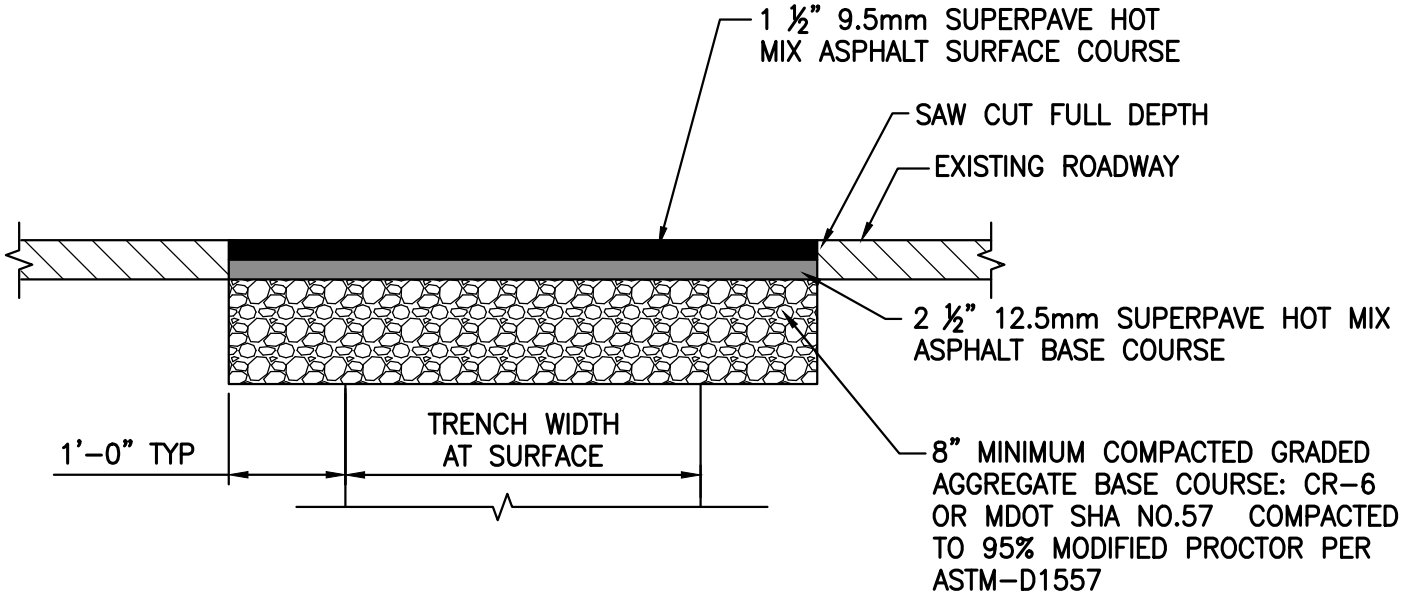

PAVEMENT RESTORATION DETAIL

TOWN OF DENTON DEPARTMENT OF PUBLIC WORKS	DENTON PUBLIC WORKS	PAVEMENT & CONCRTE DETAILS PAVEMENT RESTORATION	REVISED DEC 2007 APR 2021	SHEET PW-7.00

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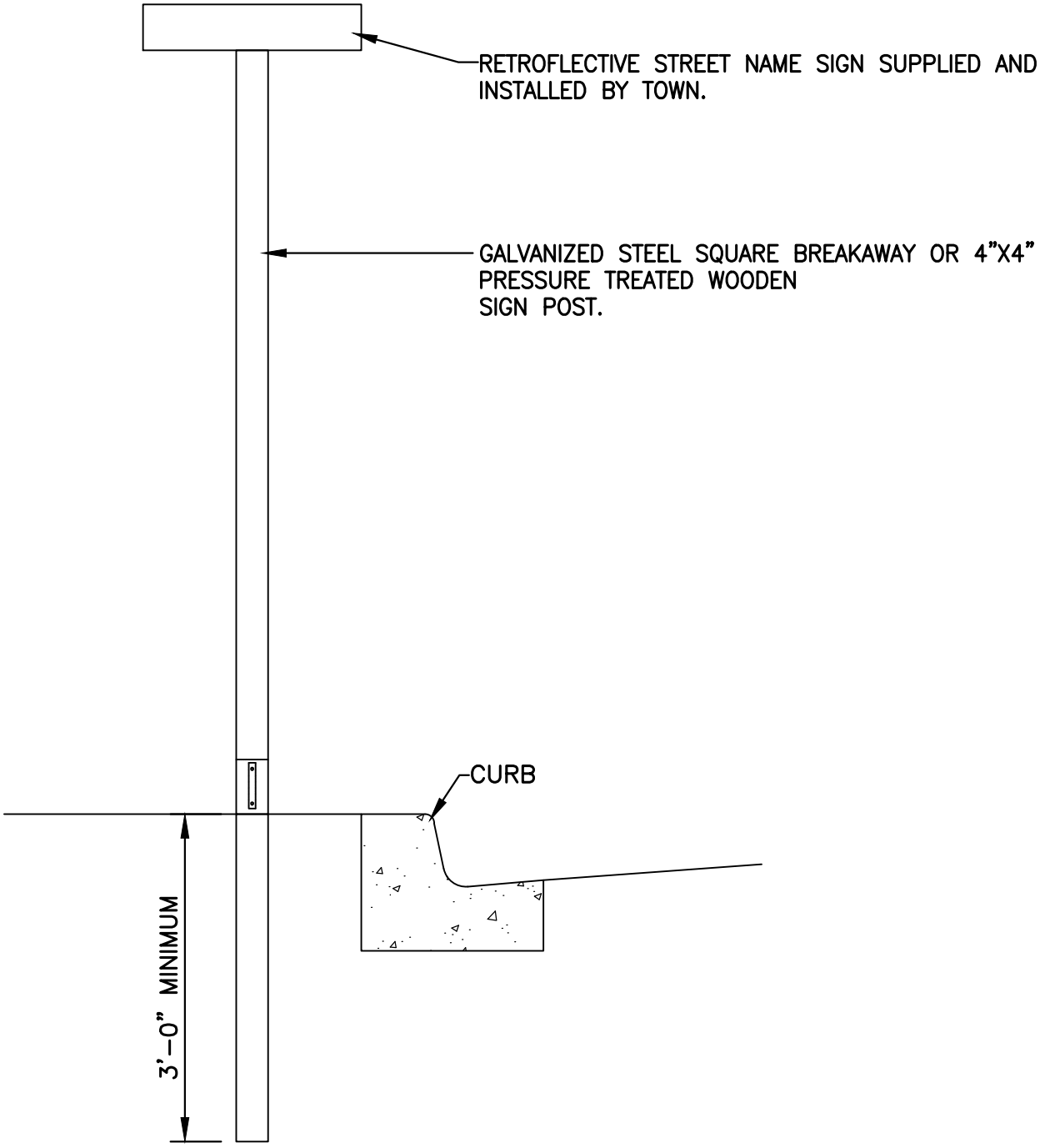

NOTES:

1. SIGN POST SHALL BE NUCOR MARION STEEL COMPANY "LAP SPLICE BREAKAWAY SYSTEM" MODEL OR AN APPROVED EQUAL.
2. SIGN HEIGHT AND PLACEMENT SHALL BE IN ACCORDANCE WITH THE CURRENT "MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES" (MUTCD).
3. FOR PRIVATE SUBDIVISION / DEVELOPMENT PROJECTS ALL SIGNAGE COSTS BORNE BY DEVELOPER.

TOWN OF DENTON DEPARTMENT OF PUBLIC WORKS		PAVEMENT & CONCRTE DETAILS STREET NAME SIGN	REVISED DEC 2007 APR 2021	SHEET PW-8.00

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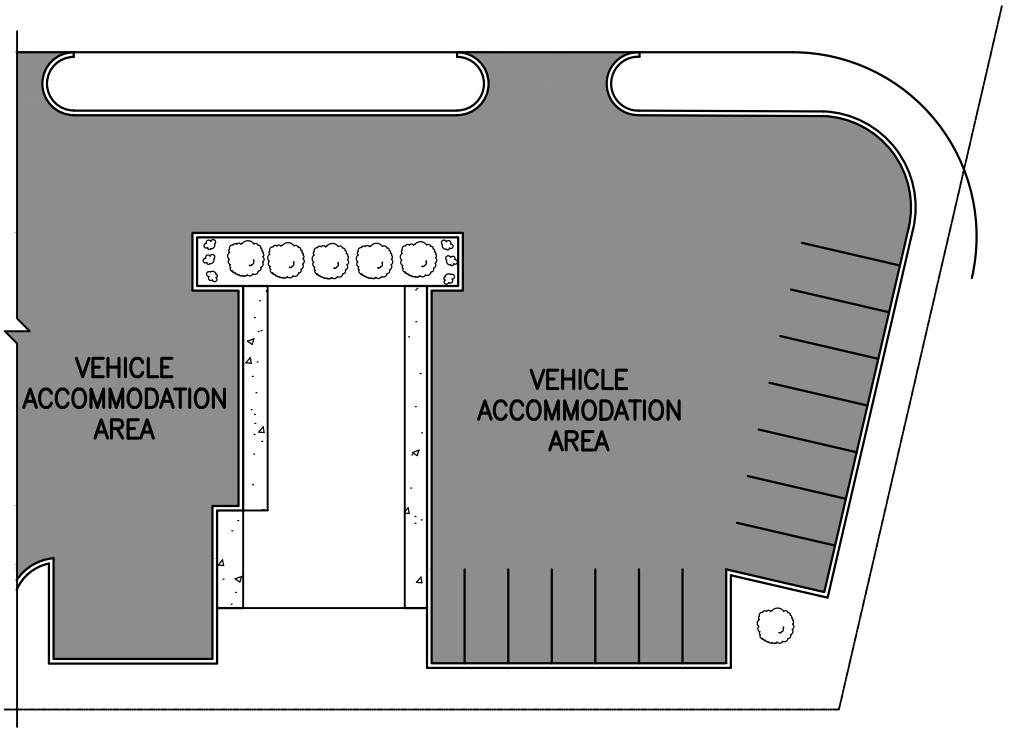

TYPICAL VEHICLE ACCOMMODATION AREA SURFACES

1½" 9.5mm SUPERPAVE HOT MIX ASPHALT SURFACE COURSE
1½" 12.5mm SUPERPAVE HOT MIX ASPHALT BASE COURSE
8" GRADED AGGREGATE BASE COURSE, OR
SOIL STABILIZATION (SOIL CEMENT) ALSO ACCEPTABLE

PAVED SURFACE SECTION

12" GRADED AGGREGATE BASE COURSE
WITH DUST FREE SURFACE

ALTERNATE - GRAVEL SURFACE SECTION

TOWN OF DENTON DEPARTMENT OF PUBLIC WORKS	DENTON PUBLIC WORKS	PAVEMENT & CONCRTE DETAILS VEHICLE ACCOMMODATION AREA SURFACES	REVISED DEC 2007	SHEET PW-9.00

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